

Water Sector Emissions Transition Plan



Energy,
Environment
and Climate Action

Cover image credit:
South East Water

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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Ministerial Foreword

Victoria's water sector is leading the way on climate action.

Our 18 water corporations have already achieved a more than 45% reduction in greenhouse gas emissions and are now powered entirely by renewable electricity. This milestone reflects the clear direction set by government and the sector's strong commitment to innovation and collaboration.

Since adopting a world-leading target of net zero emissions by 2035, the water sector has transformed its operations. Investments in solar, wind, biogas capture, energy efficiency and waste-to-energy systems have reduced emissions, lowered operating costs and created skilled local jobs. All of this has been achieved while strengthening the reliability and affordability of our essential water services.

Victoria's *Water Sector Emissions Transition Plan* sets out the next steps in this journey. It provides the direction needed to address complex emissions from wastewater treatment, fuels, construction and the supply chain, while unlocking new opportunities for innovation, resource recovery and regional development.

From 2026, the water sector's emissions profile will be dominated by methane and nitrous oxide – potent greenhouse gases released during the biological treatment of wastewater. These emissions present unique challenges for the sector and are not easily addressed with existing technologies. Success will rely on water corporations, researchers and technology providers working together to deliver solutions.

With this Plan, we are laying the groundwork for new solutions to these challenges. By creating the right environment for research and piloting new technologies, we can unlock breakthroughs that make water services more resilient and cost efficient, protect our environment and help boost Victoria's economy.

While these technologies evolve, the sector is investing in high-integrity carbon offsets that deliver environmental, cultural and social benefits. These include revegetation projects that restore landscapes, improve catchment health and offer opportunities for First Nations Peoples self-determination.

The Plan also positions the sector to build its clean economy capabilities and play an even bigger role in Victoria's renewable energy transition through products such as biogas, upgraded biomethane and recycled water for renewable hydrogen.

By strengthening skills and partnerships, expanding technical expertise and deepening sector-wide knowledge, the Plan will ensure the water sector remains a driving force in Victoria's clean economy transition.

I would like to thank Victoria's water corporations, Catchment Management Authorities and other partners who have provided valuable insights to shape this Plan. I expect all water sector entities to consider how they can play their part in delivering its actions. I look forward to seeing how the state's water sector can continue to innovate for the benefit of all Victorians.



A handwritten signature in blue ink, appearing to read 'Gayle Tierney'.

The Hon. Gayle Tierney MP
Minister for Water

Executive Summary

The Victorian water sector has reduced its emissions by 45% and is now powered by 100% renewable electricity. Water corporations are collectively committed to reducing their net emissions by more than 93% by 2030, and achieving net zero emissions by 2035.

The next stage of action will position the Victorian water sector as a leader in:

- harnessing circular economy technologies
- driving down hard-to-abate emissions
- attracting investment that supports innovation, skilled jobs, economic growth and regional development.

The Water Sector Emissions Transition Plan (the Plan) provides direction, certainty and actions for Victorians to benefit from these opportunities while pursuing lasting solutions for more challenging sources of emissions.

Until recently the electricity which powered our water and wastewater treatment plants generated greenhouse gas emissions. But the sector's investments in renewable electricity, including solar, wind, hydroelectricity and waste-to-energy systems are lowering emissions, and reducing energy costs. This supports long-term affordability for Victorians.

The water sector's remaining emissions are more difficult to reduce. They include direct emissions from the biological processes used to treat and clean wastewater, and the fuels used in heavy machinery, generators and trucks. They also include indirect emissions – such as those associated with building water and wastewater infrastructure.

Reducing these emissions to zero is a major challenge for water companies around the world and will require significant technological advancement and new processes. Addressing these challenges can contribute to a clean economy, and environmental benefits for Victoria.

Clean economy opportunities include sustainable investment, a smoother transition to new energy technology, resource recovery, new recycled products for construction and agriculture, supply chain resilience and improved water system performance. Building the skills and knowledge needed to transform our water services will ensure a resilient, future-ready workforce.

The actions we take over the next decade also need to respond to other pressures on our water systems. This includes the increase in drought, flooding, and bushfires made worse by climate change and increasing demand as new housing developments meet the needs of a growing population. At the planning and design stage, new low emissions materials and technology can be adopted for water infrastructure, wastewater treatment and vehicle fleets.

The Plan continues the water sector's leadership on climate action and ensures an efficient path to net zero emissions by 2035.

The Plan includes 18 actions across 4 priorities:

1. Make the right decisions at the right time
2. Build critical skills, knowledge and expertise
3. Catalyse innovation and capture new opportunities
4. Strengthen partnerships, track progress and measure success

These actions will ensure the water sector is on track to manage climate-related transition risks such as:

- policy uncertainty
- market changes
- emerging technology
- jobs and skills
- increasing community expectations.

The Plan supports Victorian Government priorities and actions outlined in the *Climate Change Strategy*, *Economic Growth Statement* and *Victorian Industry Policy*.

The Plan also commits to strengthening partnerships with Traditional Owners in relation to water and land management and revegetation projects that sequester carbon and support catchment health. This supports the objective of the *Water is Life Roadmap* to involve Traditional Owners in decisions about water management.

Plan snapshot

Vision

Net zero emissions water and wastewater services

Outcomes



An orderly and efficient net zero transition



Innovation and investment attraction in clean technologies



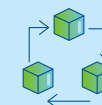
Circular economy outcomes and service improvements



Healthy Country, catchments and communities



A skilled, resilient and innovative water sector



Supply chain resilience and local green industries

Priorities & Actions

Make the right decisions at the right time

1. Better value emissions in decision making
2. Improve sector guidance on the use of carbon offsets
3. Prepare adaptive plans and identify opportunities at the largest wastewater treatment plants
4. Trial a new reporting approach to better manage climate-related transition risks
5. Strengthen and streamline the emissions reduction framework

Build critical skills, knowledge and expertise

6. Identify the skills and training pathways needed for a net zero and circular water sector
7. Assess feasibility of options to reduce wastewater emissions
8. Review opportunities to decarbonise heavy machinery, trucks and generators
9. Expand direct monitoring trials for wastewater emissions
10. Undertake a sewer network emissions estimations and opportunities study

Catalyse innovation and capture new opportunities

11. Investigate and trial low carbon and circular technologies for biosolids
12. Pilot emissions leak detection and repair study for advanced waste and wastewater management processes
13. Investigate long-term targets to increase direct action on wastewater emissions
14. Identify and monitor the largest sources of indirect (scope 3) emissions
15. Develop baselines and reduction principles for indirect (scope 3) emissions

Strengthen partnerships, track progress and measure success

16. Strengthen water sector partnerships and knowledge sharing arrangements
17. Monitor and measure key outcomes
18. Publish annual sector wide updates on successes, challenges and progress

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Credit: Yarra Valley Water

Introduction

The supply, treatment and management of water and wastewater generates significant greenhouse gas emissions and requires large amounts of energy. At the same time, a warmer, drier climate is increasing risks to our water services, catchments and waterways.

The purpose of this Plan is to guide coordinated sector-wide action towards the achievement of net zero emissions by 2035. In parallel, the five-yearly *Water Cycle Climate Change Adaptation Action Plan* is focused on activities needed to build resilience and adapt to climate change impacts.

Our vision is for Victoria's water and wastewater services to continue being reliable, safe and affordable in a changing climate. This means achieving net zero emissions while transitioning away from offsets towards direct emission reductions.

Victoria's 18 water corporations are now powered by 100% renewable electricity and have already delivered a 45.5% net reduction in the sector's emissions. This positions Victoria alongside global water leaders, such as the United Kingdom, Finland and Denmark.

The challenge for water corporations now is to address emissions from the wastewater treatment, fuels, construction and the supply chain.

By tackling these emissions water corporations are contributing to a clean and circular economy for all the industries that rely on water, including food production, manufacturing and housing.

A sustainable water supply is essential for human and ecological health and creates opportunities for strengthening partnerships between Traditional Owners and water corporations.

The actions included in this Plan will support water corporations to meet their environmental duties and obligations, collaborate on innovation and investment attraction in clean technologies, and improve supply chain resilience and opportunities for local green industries.

The Department of Energy, Environment and Climate Action (DEECA) will work in partnership with Victoria's 18 water corporations, and other government departments and agencies to deliver this Plan.

Crédit: Melbourne Water

Our vision

Net zero emissions water and wastewater services

Following a successful transition to renewable electricity, the water sector is focused on reaching net zero by addressing the water industry's toughest emissions – those from wastewater treatment, heavy vehicles and the supply chain.

With an established track record of leadership, innovation and collaboration, the Victorian water sector is ready to deliver opportunities in a low carbon and circular economy while safeguarding high-quality water and wastewater services for all Victorians.

Our key priorities



1. Make the right decisions at the right time

Clarify standards and expectations for Victoria's 18 water corporations to support informed decisions and adaptive planning, foster sector leadership, and maintain integrity.



2. Build critical skills, knowledge and expertise

Investigate global best practice and undertake coordinated research and development to build essential skills and evidence.



3. Catalyse innovation and capture new opportunities

Harness Victoria's strengths in science and engineering to trial and validate innovative low carbon and circular strategies for the water sector's most challenging sources of emissions – reducing long-term reliance on offsets.



4. Strengthen partnerships, track progress and measure success

Partner with First Nations Peoples and leverage the water sector's strengths in collaboration and knowledge sharing to deliver high quality actions while measuring and communicating our progress.

The principles which guide our decisions

Transparent and accountable approach

The right processes will ensure all water corporations share their emissions reduction plans and progress with Victorians. By providing insights on progress and challenges, we can improve understanding, trust, and long-term planning by communities and industries.

Efficient and equitable solutions

All water corporations have a common obligation to address their emissions, but opportunities to reduce those emissions will vary. Tailoring solutions and prioritising the highest public value opportunities will support an efficient and equitable low carbon transition.

Innovative and adaptive delivery

The water sector benefits from learning, innovating and testing new products and solutions. We can attract investment and take advantage of new opportunities by building the capability of the water sector's future workforce.

Safe, affordable and reliable services

The Plan presents an opportunity to safeguard the safety, affordability and reliability of water services against a changing climate and increased demand for services due to population growth.

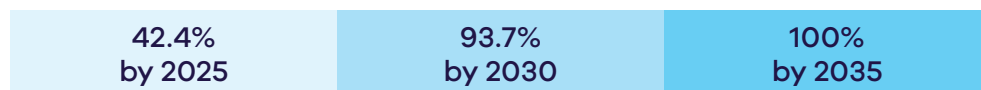
Our progress to date

Record high renewables and record low emissions

The Victorian Government has set targets for Victoria’s water corporations to achieve net zero emissions by 2035. In 2025, water corporations reported their lowest annual emissions. This achievement is the result of investments in renewable electricity, energy efficiency and other innovative projects which are not only reducing emissions but saving water corporations money and putting downward pressure on water bills.

Water corporations have almost halved their greenhouse gas emissions from baseline

Victoria’s 18 water corporations are committed to cut their collective (scope 1 and scope 2) greenhouse gas (GHG) emissions by:



These targets and accompanying emissions reduction rules are established via a Water Minister directive issued under the *Water Industry Act 1994* – the Statement of Obligations (Emissions Reduction).

These targets put the Victorian water sector on track to be the first in Australia to reach net zero emissions and contribute to the legislated Victorian target of net zero emissions by 2045.

The water sector’s emissions are at their lowest since comprehensive emissions reporting began in 2012. In the 2024–25 financial year, water corporations beat their 2025 target by 3.1% to deliver a 45.5% net reduction in greenhouse gas emissions.

This equates to about 398,000 tonnes of carbon dioxide equivalent (t CO₂-e) compared to baseline (average annual emissions between 1 July 2011 and 30 June 2016) or around 146,000 cars on Victoria’s roads for a year. Net emissions are now 49% lower in 2024–25 compared to the sector’s record high emissions recorded in 2019–20 (see Figure 1).

The water sector has achieved these emission reductions without impacts to service delivery or affordability.

Figure 1: The Victorian water sector’s total emissions (scope 1 and 2) peaked in 2019–20 before declining steadily.

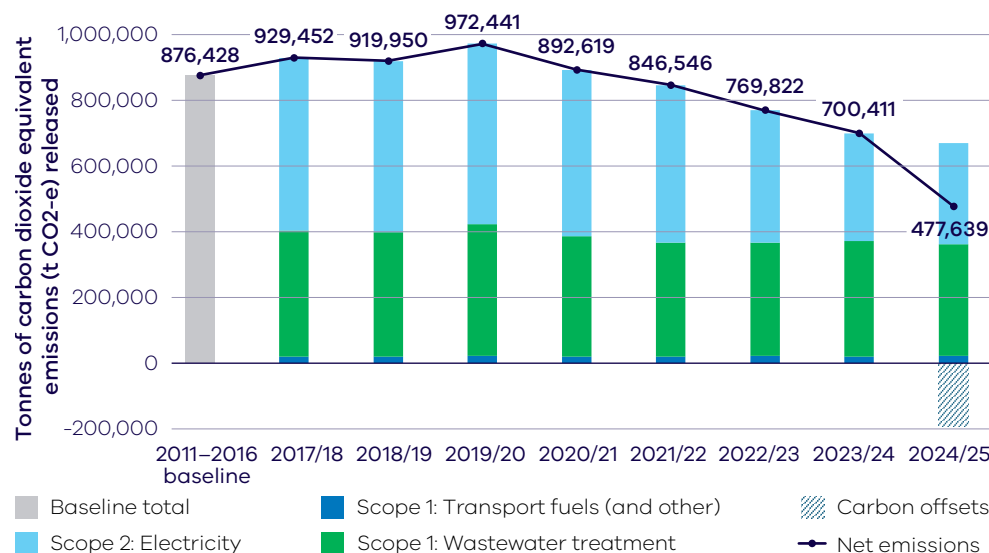


Figure 1 explainer: Water corporations’ reportable emissions have been comprised historically of the direct (scope 1) emissions from wastewater treatment (green) and indirect (scope 2) electricity emissions (blue). Net emissions have declined steadily since the 2019–20 financial year and as of the 2024–25 financial year are 45.5% lower than baseline. The sector’s emissions baseline is the average annual emissions totals between 1 July 2011 to 30 June 2016. Data has been sourced from water corporation annual reports. Emissions reporting broken down by scope was not required to be reported until the 2021–22 financial year. Scope data from 2017–18 to 2020–21 financial years has been estimated from water corporations total reported emissions figures. Water corporations’ achievement of the 100% renewable electricity commitment will be reflected in water corporations 2025–26 annual reports.

Key water sector achievements in the low carbon, renewable energy transition:

- Emissions from water sector operations are down by **45.5%** compared to baseline. That is 3% more than the 2025 target.
- Water corporations are now powered by 100% renewable electricity and have installed more than **100 megawatts** of renewable electricity generation capacity – enough to light up the Melbourne Cricket Ground more than 55 times over.
- Victoria’s water corporations generated over **240,000 megawatt hours of renewable electricity** in 2024–25, enough to power nearly 52,000 Victorian homes for a year.

Water corporations are making the switch to 100% renewable electricity

In 2022, the Victorian Government set a target for 100% renewable electricity by 2025 for government operations, including the water sector. Water corporations responded to this commitment by installing record levels of their own on-site solar, biogas, and hydroelectricity projects, and by securing cost efficient renewable electricity supply contracts. This includes 100% renewable electricity sourced from the State Electricity Commission, which began supplying renewable electricity to all large government sites over 40 megawatts (MW) in July 2025.

The sector’s investments in renewable electricity have put downward pressure on water bills for Victorians. By investing in on site renewable electricity generation and storage capacity, water corporations are saving money compared to buying electricity on the market or generating revenue when excess electricity is diverted to the grid.

Many of the case studies featured in this Plan demonstrate the value of the water sector’s investments in renewable electricity and the role water corporations can play in developing renewable fuels and gases. Biogas, biomethane and renewable hydrogen are all expected to play a role in Victoria’s transition to net zero emissions by 2045 by supporting energy resilience and decarbonisation in hard-to-abate sectors like transport and industry.

Direct emissions from wastewater and fuels are more difficult to reduce

More than 90% of the water sector’s operational emissions following the switch to 100% renewable electricity will be methane (CH₄) and nitrous oxide (N₂O) (see Figure 2).

These strong greenhouse gases are released from the process to treat wastewater either for re-use or safe release into the environment and occur at different stages of the treatment process. The diagram ‘Understanding emissions from Victoria’s wastewater’ (Page 13) shows the stages that generate emissions. This complexity is what makes determining appropriate wastewater emission reduction strategies so challenging, and why water industry innovation and leadership is so vital to the success of this Plan.

Transport fuels are the second biggest source of direct (scope 1) emissions after wastewater treatment. The water sector has already begun to decarbonise its fleet by switching to zero emissions vehicles but direct emissions from heavy vehicles, machinery and generators remain a challenge.

Figure 2: Direct (scope 1) emissions from the water sector are mostly comprised of methane and nitrous oxide.

Total Scope 1 emissions by source gas (tCO₂e) 2024–25

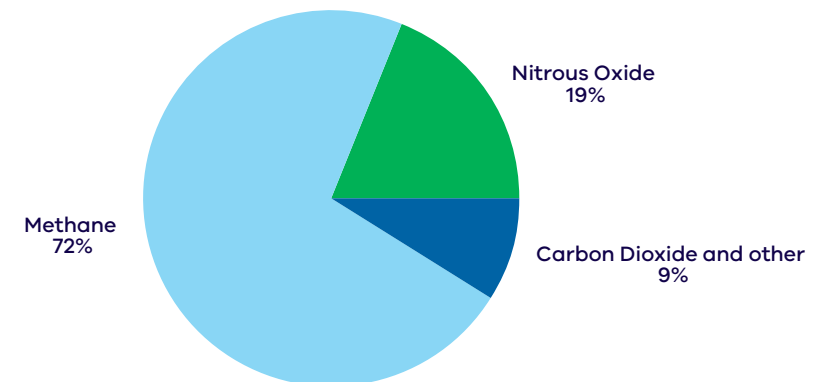


Figure 2 explainer: Victoria’s water corporations collectively emitted 361,677 tonnes of direct (scope 1) CO₂-e in the 2024–25 financial year before carbon offsets are considered. More than 90% was comprised of methane and nitrous oxide, with the remainder from carbon dioxide. Please note, small proportion of the sector’s scope 1 emissions (less than 0.1%) are comprised of other greenhouse gases. Data is sourced from water corporation annual reports.

Victoria's water services are powered by low-cost renewable electricity



Solar and battery systems are reducing emissions and costs

Grampians Wimmera Mallee Water is making a significant stride towards sustainability through the new Nhill renewable energy facility.

The facility comprises a 6.5 MW solar farm with a 2.75 MW battery system that is fully integrated and connected to the local grid. It supplies cheap renewable electricity to power Grampians Wimmera Mallee Water's operations and significantly reduces their carbon footprint.

The facility produces the same amount of renewable electricity as 1000 residential rooftop systems and is equal to 70% of their total electricity use at the 330 pump stations, treatment facilities, offices, and depots.



Harnessing water flows and gravity to generate renewable power

Central Highlands Water have constructed a mini hydroelectric plant at Lal Lal Reservoir that generates clean energy from the release of water. The energy is used to power infrastructure at the reservoir. Lal Lal is also the home to one of the solar farms that is part of Central Highland Water's solar initiative. The community-driven initiative has achieved the installation of solar panels across four large treatment plants, as well as offices and depots.

The solar and hydroelectric systems have a collective capacity of 2.7 MW, reducing energy costs and greenhouse gas emissions by around 3,000 tonnes annually.

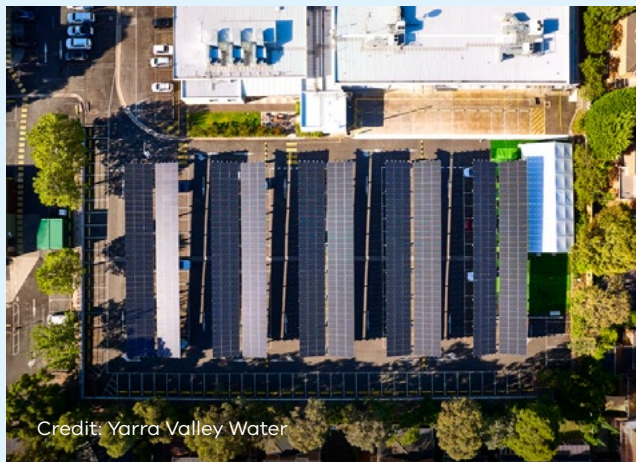


Waste to energy facility is transforming food scraps into cheap, clean power

Greater Western Water is harnessing the power of organic waste at the Melton waste-to-energy facility. The facility can treat up to 5,000 kilolitres of liquid food waste each year from local businesses and convert it into biogas. This means less organic waste going to landfill.

Biogas generated from the waste-to-energy facility and on-site solar array provides up to 100% of the Melton plant's energy needs during the day. This reduces Greater Western Water's energy costs and demonstrates the water sector's potential in developing zero emissions gas substitutes such as biogas or biomethane.

Victoria's water services are powered by low-cost renewable electricity



Solar car park and electric vehicles are reducing emissions and the cost of travel

Yarra Valley Water is expanding its network of electric vehicle chargers powered by renewable electricity to support its transition to a zero emissions fleet.

Charging points at the purpose-built solar carpark at the Mitcham head office will increase from 24 to 62. The increase in chargers will meet demand from staff, contract partners and visitors who are switching to electric vehicles.

The switch to electric vehicles has already reduced Yarra Valley Water's travel costs compared to fuel through the reduction in petrol and diesel consumption.



Floating solar will reduce water pumping costs and emissions

Wannon Water will soon host Australia's largest floating solar array as part of its plan to achieve net zero emissions by 2030.

The project will generate more than 600 MW hours of renewable electricity per year – not only reducing greenhouse gas emissions but saving a significant amount of money in pumping costs.

More than 1,200 floating solar panels are being installed at Wannon Water's Brierly Basin and are designed to harvest light from both sides, increasing the system's efficiency and making them easier to maintain.



Energy efficiency upgrades are improving reliability

South East Water is delivering a three-stage upgrade program for the aeration system at the Mount Martha Water Recycling Plant, targeting completion by 2028. The upgrade is expected to improve energy efficiency and cut electricity consumption by 30 to 40%.

The first stage has been delivered and has already reduced electricity use, operational costs, and emissions. It is also improving treatment reliability and process stability. Once the full efficiency package is complete, South East Water plan to claim Victorian Energy Efficiency Certificates to maximise both environmental and financial benefits.

Key outcomes

Harness economic opportunities and ecological benefits

The net zero transition presents opportunities for Victoria's water sector to drive innovation and attract skills and investment in circular industries and products.



An orderly and efficient net zero transition

The water sector balances short term affordability with intergenerational equity, adoption of new technology and long-term climate goals. Long-term adaptive planning, digital tools and collaboration between water corporations will identify efficiencies, optimise timing, and reduce duplication across the sector.



Healthy Country, catchments and communities

Victorian carbon offset projects are high integrity and contribute to revegetation, biodiversity and catchment health as well as new business opportunities, employment and partnerships in seed supply, nurseries and land management services.

They have potential to support the self-determination goals of Traditional Owners and First Nations Peoples to care for and connect with Country, and strengthen cultural identity.



Innovation and investment attraction in clean technologies

Victoria is a global leader in the development and adoption of new emission reduction technologies in the water sector.

The water sector supports the development of renewable hydrogen and zero emissions gas substitutes like biogas and biomethane, which are needed for industries that cannot easily electrify like long haul transport, shipping and aviation.



A skilled, resilient and innovative water sector

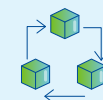
Victoria maintains a skilled workforce in the technologies and circular economy practices needed for the water sector to reduce emissions, such as emissions monitoring, advanced treatment methods, science, engineering, cleaner production and systems thinking. Research partnerships build on the strengths of Victoria's research, development and training capabilities in our universities and TAFE system to meet decarbonisation challenges.



Circular economy outcomes and service improvements

Emerging technologies design out wastewater emissions, recover valuable resources, improve water system performance and reduce odour and pollution like microplastics and per- and polyfluoroalkyl substances (PFAS).

Wastewater is seen as a resource, and resource recovery includes biogas and biomethane as zero emissions gas substitutes, thermal heat for industrial applications, phosphorus and nitrogen for fertiliser, cellulose for paper products, and biochar for soil health and as an alternative for concrete aggregates.



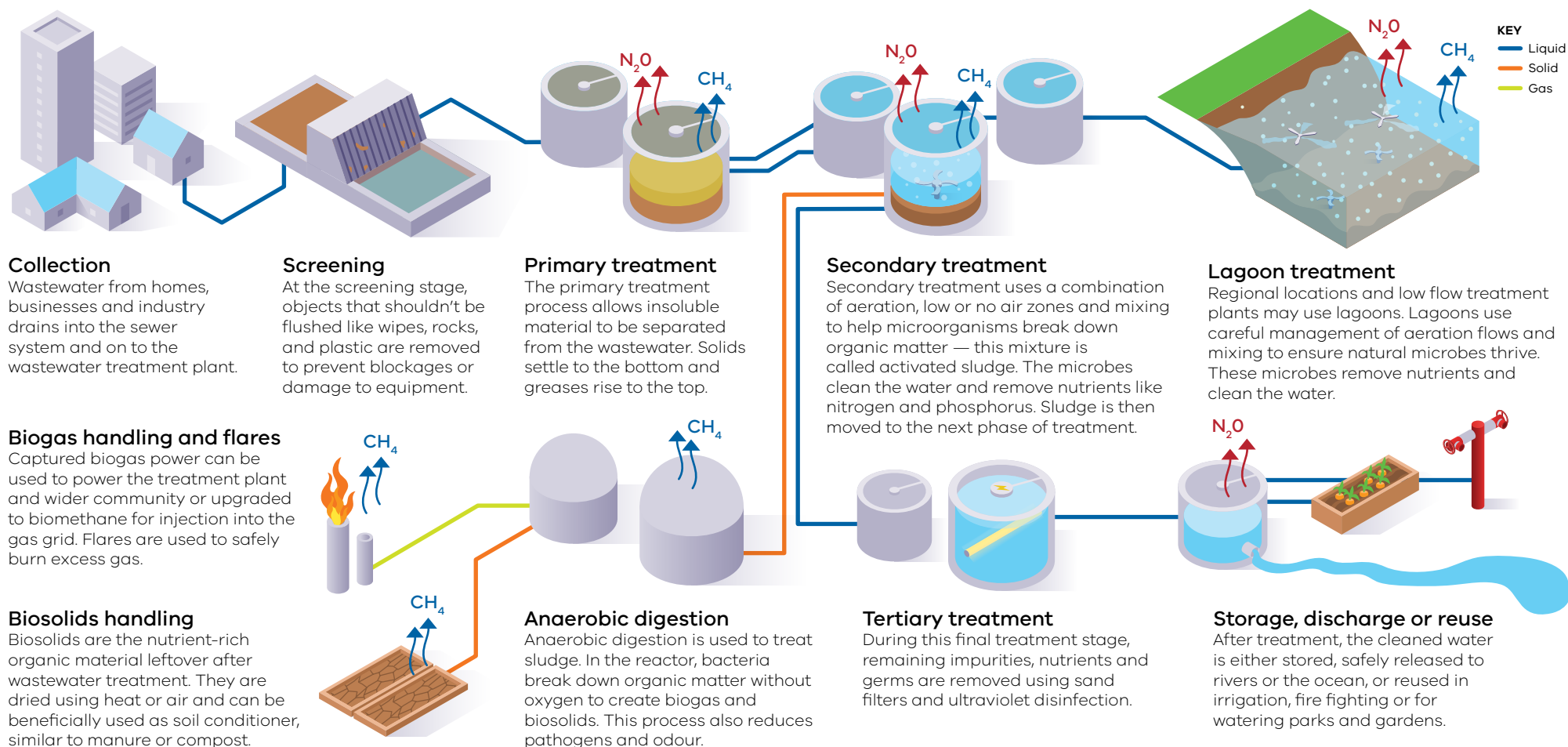
Supply chain resilience and local green industries

The water sector strengthens supply chains by engaging with local suppliers to test and trial new low carbon technology. It also shares information about future demand for low carbon products like green concrete, recycled aggregates, and sustainable pipes.

Understanding emissions from Victoria's wastewater

Victoria's wastewater system protects public health and the environment by safely collecting and treating the water we flush or drain. While running this system uses a lot of energy, significant greenhouse gas emissions also come from the biological processes used to treat wastewater, which release methane and nitrous oxide — gases far more potent than carbon dioxide. These emissions are complex and

difficult to reduce. That's because every treatment plant is different — with emissions varying depending on factors like plant design, wastewater composition and even weather. By tackling these challenges, Victoria's water sector can cut emissions and unlock the valuable resources contained in wastewater.



Note: This infographic is generic and aims to demonstrate where emissions can typically arise during wastewater treatment. It does not represent the different scale of emissions during different stages of treatment. The scale of the emissions at each stage is dependent on many variables and the specific configuration of each individual wastewater treatment plant. Additionally, while CO₂ is produced in multiple stages of the wastewater treatment process, it is primarily biogenic and does not result in a net increase in atmospheric CO₂ and as such has been excluded from this graphic.

Priority one

Make the right decisions at the right time

We will clarify standards and expectations for Victoria's 18 water corporations to support informed decisions and adaptive planning, foster sector leadership and maintain integrity.

Key objectives

- High-integrity emissions reduction and carbon offset projects deliver environmental, economic, and cultural benefits for local communities.
- Policy certainty supports coordinated, high integrity and efficient emissions reduction activities by water corporations.
- Emissions reduction is embedded into water infrastructure decisions, and guides investment toward more sustainable, long-term solutions.
- Key partners, stakeholders and the community can access information about each water corporation's net zero transition.

What we'll do

1. Better value emissions in decision making

Short-term (<3 years)



Emissions valuation is the practice of applying a dollar value to greenhouse gas emissions for decision-making purposes only – for instance, when comparing two business case options. The value would improve climate decision-making, encourages low carbon innovation, and supports cost-effective action to achieve emission reduction targets.

DEECA will work with Victorian water corporations on the introduction of an emissions value for use in water corporation business cases and review the priorities and principles in the Statement of Obligations (Emissions Reduction) in consultation with water corporations.

2. Improve sector guidance on the use of carbon offsets

Short-term (<3 years)



Many Victorian water corporations are purchasing high integrity carbon offsets to achieve net zero emissions in addition to directly reducing emissions. Some sources of emissions resulting from wastewater treatment and biosolids do not yet have technical solutions. In the short term, offsets will continue to be needed until new solutions and technologies are feasible for those left over emissions that are hard to reduce.

High-integrity carbon offsets can also support climate resilience for Victoria's catchments and communities. In addition to absorbing carbon emissions, revegetation projects enhance biodiversity, ecosystem health and habitat connectivity. This has benefits for local amenity and air and water quality. They can also provide opportunities for Traditional Owners to have an increased role in land management and carbon markets.

DEECA will prepare additional guidance for water corporations on high integrity and high-quality carbon offsets and strengthen reporting requirements.

DEECA will evaluate the barriers to emerging methods for the water sector to capture and store carbon, such as biochar, and blue or teal carbon, and review challenges to local revegetation projects.

3. Prepare adaptive plans and identify opportunities at the largest wastewater treatment plants

Short-term (<3 years)



Water corporations will prepare long term, adaptive emission reduction plans for their organisation to demonstrate how they will achieve net zero emissions by 2035. The plans will consider the best value for the water corporation and its customers, balancing short- and long-term needs.

Melbourne Water has committed to preparing asset-scale adaptive emission reduction plans for the Eastern and Western Treatment Plants by 2027. Together, these plants produce nearly 70% of the water sector's direct (scope 1) emissions. Asset-scale adaptive emissions reduction plans will also be introduced gradually for other priority wastewater treatment plants across Victoria.

By staging actions and investments based on the best available information and having the flexibility to adjust over time, the plans will assist water corporations to make the right decisions at the right time. This is important to ensure new technology can be adopted as it becomes available, rather than locking in decisions or infrastructure too early, and missing out on benefits of lower cost or improved performance. The plans will be updated regularly to inform each water corporation's water pricing period, and progress included in annual reports.

4. Trial a new reporting approach to better manage climate-related transition risks

Short-term (<3 years)



Melbourne Water will trial a climate-risk disclosure statement aligned with new Australian accounting standards in their annual report from the 2027–28 financial year.

Lessons learnt will be shared with other water corporations and government agencies that are required to comply with Victorian Government climate risk management and sustainability reporting under the *Financial Management Act 1994*.

Healthier Country through nature-based carbon sequestration



More than 320 hectares of previously cleared native forest in the Otways, on Gulidjan and Gadubanud Country, is being restored by **Barwon Water** through its nature-based carbon sequestration program.

Re-establishing forest removes carbon dioxide from the atmosphere, storing it in the biomass of trees and other vegetation, however the benefits go well beyond carbon. These projects will enhance habitat and biodiversity, improve catchment and waterway health, and reduce water quality risks.

Barwon Water's projects are in the Dewing Creek catchment, part of the Geelong region's water supply, and Aire River catchment, adjoining the Great Otway National Park. Between 2026 and 2027, more than 150,000 locally sourced plants will be planted, including a range of threatened species and ecological vegetation classes (such as wet forest and cool temperate rainforest).

Eastern Maar Aboriginal Corporation's Country Guardians team have been engaged to help deliver land management works at Dewing Creek and both organisations are collaborating to expand Traditional Owner involvement in these and other nature-based projects, supporting the Meerreengeeye ngakeepoorryeeyt (Healthy Country Plan) and Eastern Maar's Water is Life – Nation Statement.

This action will improve understanding of the climate-related physical and transition risks to Melbourne Water's services and functions as well as the opportunities. The reporting will provide Melbourne Water's customers with greater insight into the actions being taken to build climate resilience and reduce emissions, and the innovations still required to achieve net zero.

5. Strengthen and streamline the emissions reduction framework

Short-term (<3 years)



DEECA will update the emissions reduction framework in the Statement of Obligations (Emissions Reduction) and prepare an implementation guide to clarify requirements.

This action will identify areas of improvement and streamlining, and clarify technical reporting issues, including for carbon offsets. The updated guidance will enable harmonisation with Australian Government standards including the National Energy and Greenhouse Reporting (NGER) Scheme and Safeguard Mechanism.

Victoria's largest wastewater treatment plant kick starts adaptive planning process



Photo credit: Melbourne Water

For over 130 years, the Western Treatment Plant has delivered world-class sanitation for Melbourne.

Since the 1980s, its role has expanded to include resource recovery and biodiversity protection, becoming a Ramsar-listed bird sanctuary and generating energy from waste.

By the 2000s, major upgrades reduced environmental impacts and increased recycled water production. Today, Western Treatment Plant treats over 200,000 million litres of sewage annually.

As Melbourne's population is projected to exceed 8 million by 2051, the plant must prepare to manage nearly double the current waste volume.

The Western Treatment Plant is more than a treatment facility; it's also a working farm and internationally recognised habitat for rare species like the orange-bellied parrot and growling grass frog.

To meet future challenges, Melbourne Water is adopting an adaptive planning approach. Unlike traditional predictive approaches, adaptive planning prepares for multiple possible futures, identifying key decision points and enabling timely, transformative, and equitable actions. It integrates technical knowledge, community values, and regulatory frameworks to guide infrastructure decisions.

The Western Treatment Plant Adaptive Plan will outline pathways for future interventions, ensuring the plant continues to serve growing communities while meeting evolving expectations, including on emissions.

By keeping options open and assessing multiple scenarios, adaptive planning helps Western Treatment Plant respond to system-wide shocks such as climate extremes and sea level rise. This approach ensures the Western Treatment Plant remains resilient, sustainable, and responsive, co-delivering essential sanitation and biodiversity outcomes for generations to come.

Innovative water sector initiatives reduce emissions and deliver multiple benefits



Rethinking wastewater treatment supports renewable hydrogen and resource recovery

North East Water is upgrading the Wodonga wastewater treatment plant to increase capacity and reduce emissions. Due for completion in 2026, the project will reduce emissions by 50% or 6,500 tonnes of CO₂ per year and complement the site's existing 3 MW solar farm. The upgrade includes new covered lagoons which capture methane and convert it to biogas to power the treatment plant.

The upgrade is also designed to integrate with Australia's largest hydrogen electrolyser at the neighbouring Hydrogen Park Murray Valley. The 10 MW electrolyser will use wastewater to produce renewable hydrogen which will then be blended with natural gas in the Albury-Wodonga network and supply over 40,000 residential, commercial and industrial customers.



Low carbon concrete alternatives reduce waste

Joint winners of the 2023 Water Minister's Climate Innovation Challenge **Barwon Water**, **North East Water**, and **Yarra Valley Water** collaborated on a new guide and database of low-carbon concrete alternatives ready for application in the Victorian water sector.

The water sector uses significant quantities of concrete in pipes, water tanks and treatment plants but alternative mixes using ingredients such as slag or fly ash can lower emissions, reduce waste and could even offer superior technical performance.

The guide also includes a Low Carbon Concrete Mix Selection Tool to inform the selection of the best low-carbon product for a given application.



Nature based solution reduces emissions and pollutants

Westernport Water's innovative floating wetland system demonstrates the potential of nature-based solutions to address wastewater emissions across all three major greenhouse gases.

The pilot system installed at Cowes has successfully shown that wetland plant species suspended on the water with their roots submerged can reduce the emissions from wastewater. As the plants grow, their roots provide habitat for microorganisms that help to remove wastewater pollutants and nutrients which cause emissions.

Every six months the nutrient-filled plants are harvested, allowing for new growth so the cycle can continue. The harvested plants have the potential to be re-used, composted, or turned into biochar.

Innovative water sector initiatives reduce emissions and deliver multiple benefits



Reforestation captures carbon, creates habitat and improves water quality

In 2025, **Southern Rural Water** planted the first trees of its Carbon Reforestation Offsets Project. Plantings at Lake Glenmaggie will create 13 hectares of new forest and sequester approximately 4,000 tonnes of CO₂ from the atmosphere over 25 years.

The planting project is informed by extensive community consultation, and technical assessments, to address bushfire risk, cultural heritage, land suitability and visual amenity.

By planting species that are native to the local area, the project will create habitat and corridors for a wide range of flora and fauna and connect areas of existing vegetation across the landscape. Reforestation at this site will also support soil health and improve water quality by reducing nitrogen and phosphorus runoff and mitigating erosion.

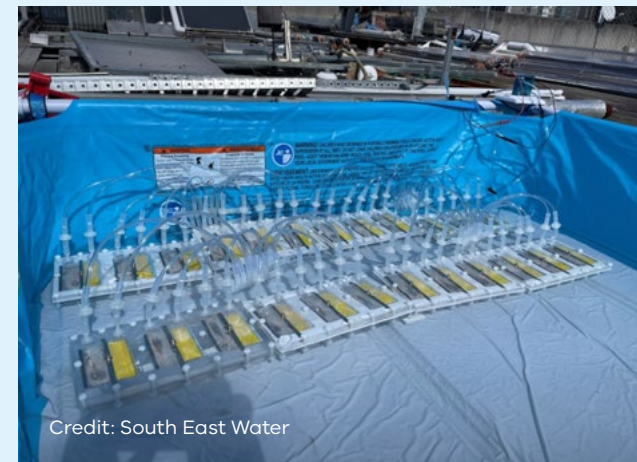


Regional partnership creates renewable energy and displaces natural gas use

Barwon Water has partnered with local employers to turn waste into valuable resources, create local jobs and reduce costs for customers.

The Colac Renewable Organics Network (RON) takes organic waste from local industry – the Australian Lamb Company (ALC) and Bulla Dairy Foods – and converts it into biogas through a process called anaerobic digestion. The biogas is combusted to create renewable electricity and heat. Renewable electricity generated from the biogas powers the Colac Water Reclamation Plant.

In an Australian first, Barwon Water has installed a heat transfer pipeline to supply renewable heat to the ALC, reducing their natural gas consumption by 21.4 terajoules, cutting greenhouse gas emissions by 1,000 t CO₂-e a year – equivalent to the gas usage of 350 households.



Using the power of solar and recycled water to create renewable hydrogen

South East Water partnered with RMIT University to win the 2024 Water Minister's Climate Innovation Challenge by developing a groundbreaking method of producing renewable hydrogen.

The world first technology uses a floating modular platform to convert solar radiation and recycled water into renewable hydrogen and valuable oxidants like ozone and hydrogen peroxide.

The technology is designed to be scalable and adaptable, meaning it can integrate with existing infrastructure across the water sector to help reduce emissions and improve water quality.

Priority two

Build critical skills, knowledge and expertise

We will investigate global best practice and undertake coordinated research and development to build essential skills and evidence.

Key objectives

- Water corporations are guided by robust, adaptive emissions reduction plans that reflect emerging technologies, new information and evolving climate risks.
- The technical and commercial feasibility of wastewater emissions solutions is well understood across the sector.
- The sector has the right skills, expertise and capacity to deliver an orderly and affordable transition to net zero emissions.
- Lessons from trials, pilots and research accelerate learning, innovation and continuous improvement.

What we'll do

6. Identify the skills and training pathways needed for a net zero and more circular water sector

Short-term (<3 years)



The transition to a clean economy means rethinking how water and wastewater services are designed and delivered. With technological advances, changing work practices and increased competition for expertise, it is essential to bolster the water sector's clean economy skills.

DEECA will work with other government agencies, and water industry stakeholders to undertake a sector-wide skills and capability assessment to identify current strengths, gaps and future needs.

The findings will inform the development of training pathways, and workforce development strategies in key areas such as resource recovery, renewable energy, advanced treatment technologies, carbon management, systems thinking and emissions monitoring technologies.

7. Assess feasibility of options to reduce wastewater emissions

Medium-term (<5 years)



This action will assess the technical and commercial feasibility of directly reducing wastewater treatment emissions.

DEECA will collaborate with water corporations, researchers and stakeholders to investigate the cost, suitability, readiness, potential impact and scalability of identified solutions.

The action will also support research trials to reduce emissions from wastewater treatment plants and other sources of emissions and identify opportunities to scale up solutions.

This action will reduce overall research and development costs, share knowledge across the sector and attract research talent to work on the most challenging sources of emissions.

8. Review opportunities to decarbonise heavy machinery, trucks and generators

Short-term (<3 years)



Transport fuels are the water sector's second biggest source of direct (scope 1) emissions after wastewater treatment. Water corporations have already begun to decarbonise their passenger fleets by switching to zero emissions vehicles, but vehicles such as trucks, machinery and back-up generators remain harder to address. These assets are often powered by diesel.

Electric alternatives for these assets are not available for all the types of equipment needed. Renewable fuels such as renewable diesel, hydrogen and ammonia could provide solutions for these emissions, especially as renewable diesel can be used as an alternative in standard internal combustion engines, however, more research is needed.

This action will assess decarbonisation options for the water sector's heavy machinery, truck, and generator fuel uses. The risks, costs, suitability and benefits will be examined, including through trials, with outcomes shared across the sector.

Results will inform water corporations' adaptive planning, increase understanding of renewable fuels and electrification opportunities, reduce long-term fuel use costs, and help to reduce the sector's reliance on diesel supply chains.

Victoria's first hydrogen powered prime mover



Barwon Water is leading Victoria's first trial of a hydrogen-powered fuel cell electric prime mover. The truck is used to transport biosolids from water reclamation plants to the biosolids processing plant where they are turned into a pelletised fertiliser product for the agricultural sector.

This initiative supports Barwon Water's commitment to reducing operational emissions and advancing the region's circular economy. The trial will provide valuable data on the costs and performance of hydrogen fuel compared to traditional diesel trucks.

Barwon Water is undertaking this project in partnership with Viva Energy, who – in June 2025 – opened Australia's first publicly accessible commercial hydrogen refuelling station at their Energy Hub in Geelong. The truck will refuel at the service station which produces renewable hydrogen via electrolysis (2.5 MW capacity) using recycled water from Barwon Water's Northern Water Plant.

The trial and service station are funded through the Australian Renewable Energy Agency (ARENA) and the Victorian Government's Renewable Hydrogen Commercialisation Pathways Fund.

In an adjacent ARENA funded project, Barwon Water is also exploring green oxygen for wastewater, which will trial the use of the oxygen by-product from Viva's electrolyser to improve wastewater treatment at the Northern Water Plant. This circular economy project could reduce treatment plant energy demand, improve treatment performance providing capital deferral benefit; and demonstrate potential fugitive nitrous oxide emissions reductions at the plant.

These projects demonstrate the water sector's ability to support expansion of Victoria's emerging renewable hydrogen sector, to help industries like transport reduce their emissions – helping Victoria achieve net zero emissions state-wide by 2045.

9. Expand direct monitoring trials for wastewater emissions

Medium-term (<5 years)



This action will investigate technical issues in measuring the direct (scope 1) emissions from wastewater, such as for methane and nitrous oxide emissions.

Melbourne's 4 water corporations will take action to improve methods used to measure emissions by delivering monitoring and disclosure trials at 5 wastewater plants: the Eastern Treatment Plant, Western Treatment Plant, and one plant operated by each of Greater Western Water, South East Water, and Yarra Valley Water.

All water corporations will disclose the NGER method they use to calculate wastewater emissions, and any assumptions, uncertainties and opportunities for improvement.

The evidence and learnings from this initiative will be shared across the sector, considered in future improvements to reporting requirements, and inform consultation with the Australian Government on updates to the NGER methodology.

10. Undertake a sewer network emissions estimations and opportunities study

Medium-term (<5 years)



Victoria's water sector is committed to assessing the extent to which sewer network emissions can be better measured, monitored, and reduced.

Melbourne Water will lead an emissions study on Melbourne's sewer network in collaboration with the metropolitan retailers and relevant research organisations. The study will first outline the current state of knowledge on sewer network emissions, before assessing good practice modelling tools and methodologies to estimate and quantify emissions with a long-term view to evaluating the feasibility of intervention options to reduce those emissions in the Victorian context.

Upon completion, action delivery partners will consider whether the implementation approach could be replicated for other poorly understood water sector emissions sources – such as the emissions from dams and reservoirs.

Building a more complete picture of emissions from wastewater treatment



Credit: Melbourne Water

Melbourne Water has been using cutting edge science and techniques to more accurately measure and monitor direct greenhouse gas emissions at sewage treatment plants through its Real Greenhouse Gas Emission Measurement Program.

This pioneering program brings together leading universities, researchers, and other Australian and international water corporations to create new tools and methods that offer a more detailed and accurate picture of emissions from wastewater treatment.

Findings reveal that emissions fluctuate significantly across seasons and often differ from estimates based on national reporting guidelines. With this improved data, Melbourne Water gains deeper insights into the factors driving emissions, enabling more accurate reporting of emissions and the investigation of more effective reduction strategies.

The program's results will also help contribute to new standards for measurement accuracy and predictive modelling in sewage treatment, pushing the entire water sector closer to achieving net zero emissions.

Priority three

Catalyse innovation and capture new opportunities

We will harness Victoria's strengths in science and engineering to trial and validate innovative low carbon and circular strategies for the water sector's most challenging sources of direct and indirect emissions.

Key objectives

- Water corporations contribute to regional development through circular economy innovation and supporting clean economy precincts.
- Collaboration with suppliers supports supply chain resilience and encourages the development of local green industries through demand for low carbon products.
- Water sector innovation is underpinned by high-quality data, cross-sector trials, and strong partnerships with research and technology providers.
- Water corporations are prepared to take advantage of new opportunities, are agile to change and working to transform water services for the future.

What we'll do

11. Investigate and trial low carbon and circular technologies for biosolids

Short-term (<3 years)



Biosolids, the organic material left over after the sewage treatment process, are rich in important nutrients like nitrogen, carbon and phosphorus and can be re-used as a soil additive or fertiliser. However, current biosolids management, disposal and land application, release significant greenhouse gas emissions. Evidence also suggests biosolids can contain emerging contaminants like PFAS, heavy metals, and microplastics which can cause harm to humans and the environment. Finding a sustainable solution for biosolids is even more important as our population, and therefore waste, grows.

The water sector is exploring emerging thermal treatment technologies such as incineration, pyrolysis and gasification which can cut emissions, destroy harmful contaminants and turn biosolids into valuable resources like biochar, syngas or ash. These resources can be used as a soil additive to improve soil quality and crop yields for primary producers, as a substitute aggregate for cement filler or sand in construction, or as a binding agent in road pavements.

Research partnerships between the water sector, Intelligent Water Networks, government agencies and universities will trial safe, thermal treatment technologies and end use markets to determine feasibility. The research results will inform decarbonisation and circular economy strategies, and business cases to scale up delivery of high performing technologies at priority sites across Victoria.

12. Pilot emissions leak detection and repair study for advanced waste and wastewater management processes

Medium-term (<5 years)



The water sector is introducing and exploring alternative waste management methods such as increased biogas capture through anaerobic digester tanks, co-located waste to energy facilities, and thermal treatment of sludge compared to lagoon-based systems. However, these waste management methods have the potential to leak greenhouse gas emissions.

Research partnerships with water corporations to pilot greenhouse gas leak detection and repair studies for emerging waste management methods/ biogas generating facilities will be encouraged.

Lessons learnt will inform the assessment of cost-effective detection and repair options and in the longer term, potential requirements for all biogas generating facilities and thermal treatment technologies to monitor and repair leakages.

13. Investigate long-term targets to increase direct action on wastewater emissions

Long-term (<10 years)



The water sector's current net zero emissions targets provide the policy and investment certainty water corporations need to deliver efficient emissions reduction and innovation. However, cost effective direct abatement of wastewater emissions is likely to remain a long-term challenge for most water corporations.

To increase direct action, DEECA will investigate the feasibility of more stringent emissions reduction targets or standards building on the research and evidence for the feasibility, cost effectiveness and scalability of new technologies and practices.

14. Identify and monitor the largest sources of indirect (scope 3) emissions

Medium-term (<5 years)



Supply chain emissions from construction materials, chemicals, outsourced services, employee commuting, and waste are called indirect (scope 3) emissions because they are generated by an organisation's upstream and downstream activities.

Water corporations will identify the most significant sources of their organisation's indirect (scope 3) emissions in collaboration with DEECA. The highest priorities are the most emission-intensive activities and those where water corporations have the highest capacity for influence. This information will be used to design reporting indicators that can be improved over time.

By measuring these emissions, the water sector will be able to identify, prioritise and target emissions hotspots in their value chain. This will strengthen engagement with suppliers and provide information to the market about the water sector's priorities and potential for low carbon products and services.

The technology converting wastewater sludge to biochar in Victoria



Credit: Inside Water

Over the past eight years, RMIT, **South East Water**, **Greater Western Water**, and the **Intelligent Water Networks** have collaborated to develop and test an innovative pyrolysis technology called PYROCO. This process transforms biosolids – the organic waste from wastewater treatment – into valuable biochar by heating them at high temperatures without oxygen.

The pilot PYROCO unit at Greater Western Water's Melton Treatment Plant has successfully destroyed harmful PFAS contaminants and produced high-quality biochar that can be used in agriculture and various industrial applications. Building on this success, the partners are now scaling up with a larger demonstration plant at a South East Water site.

This technology not only reduces the amount of biosolids waste, it also captures carbon, lowers transport costs, and cuts emissions – strengthening Victoria's circular economy and environmental protection efforts.

15. Develop baselines and reduction principles for indirect (scope 3) emissions

Long-term (<10 years)



DEECA will collaborate with water corporations to establish baselines and principles for reducing indirect (scope 3) emissions in a transparent and cost-effective way. This will allow water corporations flexibility in implementation while practices for reducing emissions through procurement and purchasing continue to mature.

This action is consistent with the Victorian Government's Recycled First policy.

Tackling construction emissions increases use of recycled materials



Credit: Yarra Valley Water

Yarra Valley Water has set a voluntary target to reduce its Scope 3 emissions by 67% from a 2024 baseline by 2030. Establishing this baseline was a key step, helping the organisation identify the most significant sources of emissions across its value chain, deepen its understanding of Scope 3 emissions, and shape effective reduction strategies.

With Scope 3 targets now in place, Yarra Valley Water is actively taking steps to reduce these emissions. They are partnering with Melbourne Water on revegetation projects to generate carbon credit units for both Yarra Valley Water and Melbourne Water – addressing Yarra Valley Water's upstream bulk water supply and wastewater treatment emissions.

Yarra Valley Water has also introduced a carbon-in-construction tool and is collaborating with suppliers to boost the use of recycled, reprocessed, and lower-carbon materials in construction and maintenance projects. They are also exploring ways to help customers reduce emissions linked to water use including a pilot water audit and shower head exchange program which has the potential to reduce customer's water and energy bills and reduce emissions associated with heating water

Strong partnerships helping to maintain sustainable water services



International partnerships sharing innovative solutions

Melbourne Water, Denmark's **Aarhus Vand**, United Kingdom's **Severn Trent** and Italy's **Gruppo CAP** have formed an international alliance, working in partnership to tackle some of the biggest challenges associated with wastewater treatment. Together they are sharing knowledge, establishing new international standards for emissions reporting and co-creating innovative technologies that will aid in the journey to net zero.

Partnerships like this strengthen the water sector's approach to emissions reduction by taking lessons learnt from across the globe and adjusting them to fit the unique wastewater challenges in Victoria.



Upper Yarra Sewage Treatment Plant delivering win for biodiversity and climate

Yarra Valley Water in partnership with the DEECA, Melbourne Water, Zoos Victoria, Jacobs, the North East Link Project, and Traditional Custodian's the Wurundjeri Woi-wurrung People are restoring buffer land at the Upper Yarra Treatment Plant to create a mix of woodland and wetland habitat for two critically endangered native species and Victorian faunal emblems; the Helmeted Honeyeater and lowland Leadbeater's Possum. The restoration involves planting over 170,000 native plants across 35 hectares of the site. The plant species used will provide essential resources for the two species and sufficient area to support self-sustaining populations of both.

Wetland habitat areas will integrate recycled water produced at the treatment plant to create a climate resilient habitat and further improve the quality of recycled water prior for release to the environment. The planting is expected to sequester 7982 tonnes of CO₂.



State-wide partnership securing low-cost solar energy

Zero Emissions Water is a collective of 12 Victorian water corporations working together to reduce their emissions.

The members collectively purchase renewable electricity certificates from the Kiamal Solar Farm, in north-west Victoria near Ouyen. The 200MW Kiamal Solar Farm is currently Victoria's largest solar array and generates over 560 gigawatt-hours of renewable electricity annually.

This innovative partnership is the first of its kind for Australia's water sector. By working together, Zero Emissions Water members have secured cost-effective renewable electricity while economies of scale increase efficiency.

Priority four

Strengthen partnerships, track progress and measure success

The implementation of this plan will build on the Victorian water sector's strong track record by strengthening partnerships with communities, industries and government agencies to deliver safe, affordable and sustainable water services. By tracking progress and sharing lessons learnt by the water sector new practices can be shared with other industries.

Key objectives

- Decision-makers, stakeholders and communities have a clear understanding of the sector's unique emissions profile, constraints, and opportunities.
- Benefits from emission reduction activities are shared with water users and deliver public value for money.
- Collaboration across the sector supports a culture of innovation, minimises duplication, and fosters leadership.
- New and strengthened partnerships emerge with First Nations Peoples, urban and regional communities, industries and training providers.

What we'll do

16. Strengthen water sector partnerships and knowledge sharing arrangements

Ongoing



This Plan will be delivered by Victoria's 18 water corporations and DEECA. Collectively we seek to partner with First Nations Peoples and Traditional Owners, Victoria's 9 Catchment Management Authorities, industry stakeholders like VicWater, Intelligent Water Networks, and the Water Services Association of Australia to implement the Plan's actions. We will also strengthen partnerships with complementary industry stakeholders to support development of the emerging renewable fuels and hydrogen sectors.

To operationalise this commitment, DEECA will work with the water corporations to design effective delivery models for each action and to facilitate collaboration and knowledge sharing. The different capacities of each organisation will be considered in the implementation of the Plan, to maximise the benefits of sharing solutions and avoiding duplication of effort.

Industry partners such as the Water Services Association of Australia, VicWater and the Intelligent Water Networks continue to play an important leadership role in identifying industry solutions. By working together the sector will deliver the benefits and outcomes of this Plan for all Victorians.

17. Monitor and measure key outcomes

Ongoing



The drivers for this Plan demonstrate the importance of being adaptive to new knowledge and changing circumstances. Therefore, DEECA will design and install processes which enable us to monitor our success and shift course where needed.

The key objectives from this Plan are defined under each priority. Measuring our progress against these objectives will mean we can learn and adapt throughout implementation.

DEECA will work with the water corporations to define metrics for these objectives and assess progress annually. We will also track delivery of each action

and share this online. Consistent with adaptive planning principles, the Plan itself will be reviewed and updated as new information becomes available.

18. Publish annual sector wide updates on successes, challenges and progress

Ongoing



Water corporations will continue to publicly report their progress towards net zero in their annual reports and on their websites.

DEECA is committed to sharing accessible information on sector-wide insights, trends, research findings, and progress towards net zero targets for the public as well as research and industry audiences.



Credit: Central Highlands Water

Glossary

Term	Definition
Aeration	The process of introducing oxygen into a system to improve the treatment of wastewater.
Adaptive planning	A plan that uses flexible strategies that can respond to change and embed new developments in science, technology and innovation.
Aggregate	A component of a material or structure that is composed of multiple smaller parts. Biochar can form an aggregate in concrete.
Anaerobic digestion	A biological process in wastewater treatment in which microorganisms break down organic matter in the absence of oxygen.
Biochar	The carbon rich material that is produced when biosolids are heated to high temperatures with low oxygen.
Biogas	A mixture of methane, carbon dioxide and small quantities of other gases produced by from the breakdown of organic matter (such as the organic material in wastewater) in an oxygen-free environment.
Biomethane	A renewable gas derived from biogas.
Biosolids	Organic material left after the sewage treatment process.
Blue carbon	Blue carbon is the carbon stored in coastal ecosystems like seagrass meadows, saltmarshes and mangroves.
Carbon offset	A unit equivalent to a tonne of emissions removed from the atmosphere.
Catchment management authority	A statutory body established under the <i>Catchment and Land Protection Act 1994 (Vic)</i> . Catchment management authorities have responsibilities under both that Act and the Water Act for river health; regional and catchment planning and coordination; and waterway, floodplain, salinity and water quality management.
Circular economy	An economic system based on the principles of designing out waste and pollution, keeping products and materials in use, and regenerating natural systems.

Term	Definition
Climate risk	The potential for adverse consequences resulting from climate change hazards. These risks can be both physical and transitional or related to opportunities.
Electrolyser	A device that splits hydrogen and oxygen atoms using an electrical current.
Emissions value	The practice of applying a dollar value to greenhouse gas emissions for decision-making purposes only – for instance, when comparing two business case options. An emissions value is different to a carbon price.
Greenhouse gas	Emissions of (a) carbon dioxide, methane, nitrous oxide or sulphur hexafluoride or (b) a hydrofluorocarbon or perfluorocarbon that is specified in regulations under the National Greenhouse and Energy Reporting Act 2007 of the Commonwealth.
Intelligent Water Networks	A membership-based program run by VicWater currently comprised of the Victorian Urban Water Corporations, TasWater, and DEECA researching and delivering innovative solutions to water sector challenges.
Nature-based solutions	An action to address climate change that is designed to protect, restore or manage ecosystems.
Net zero emissions	An annual reportable emissions total of zero calculated according to the rules outlined in the Statement of Obligations (Emission Reduction).
Renewable fuels	Fuels produced from renewable resources such as renewable diesel, hydrogen and ammonia.
Renewable hydrogen	Hydrogen produced using electricity from renewable sources that can be used as an alternative fuel source.
Residual emissions	The emissions that remain after an organisation has implemented all feasible opportunities are implemented. These are the emissions that typically require offsets to reach net-zero.

Term	Definition
Per and polyfluoroalkyl substances	A group of manufactured chemicals, containing a component with multiple fluorine atoms, with many specialty applications – examples are perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA).
Scope 1 emissions	Direct emissions from owned or controlled sources (such as combustion of fuels in vehicles and back-up generators, medical gases, and wastewater treatment).
Scope 2 emissions	Indirect emissions from the generation of electricity, steam, heating, and cooling purchased by the entity.
Scope 3 emissions	All other indirect emissions that occur in an entity's value chain (such as purchased goods and services, business travel, employee commuting, waste disposal, up-stream and downstream transportation and distribution, and investment).
Sequester	Carbon sequestration is the capture and storage of carbon – for example, from natural carbon sinks such as trees.
Sewage	Liquid waste produced by households and businesses.
Sewer network	The pipes and plants that collect, remove, treat and dispose of liquid urban waste.
Sludge	A byproduct of wastewater treatment containing human waste, microorganisms, chemicals and other materials suspended in water.
Statement of Obligations (Emissions Reduction)	Ministerial directive issued under the <i>Water Industry Act 1994</i> establishing and specifying the greenhouse gas emissions reduction and renewable electricity use obligations for Victoria's 18 water corporations.
Supply chain	The suppliers, industries and activities involved in the process of getting a raw material to its end customer.
Syngas	Abbreviation of synthetic gas which is a mixture of carbon dioxide, carbon monoxide and hydrogen. It is produced when carbon rich materials undergo gasification or pyrolysis.
t CO ₂ -e	Tonnes of carbon dioxide equivalent greenhouse gas emissions. The amount of a greenhouse gas that an entity emits is measured as an equivalent amount of carbon dioxide.

Term	Definition
Teal carbon	Carbon that is absorbed and stored by freshwater inland wetlands.
Thermal treatment technology	A broad term referring to processes that use heat to alter the properties of a material. These processes include incineration, gasification and pyrolysis.
Transition risks	Those risks related to the transition to a low-carbon economy which could entail policy, legal, reputational, technology and market changes.
Water industry	Victoria's 18 water corporations.
Water infrastructure	Facilities, services and installations needed for the functioning of a water system.
Wastewater	Water that has had its quality affected by human influence, deriving from industrial, domestic, agricultural or commercial activities.
Water corporation	Government owned organisations who provide a range of water services to customers within their service areas including water supply, sewage and trade waste disposal and treatment, water delivery for irrigation and domestic and stock purposes, drainage, and salinity mitigation services.
Waste-to-energy	A process that uses incineration, gasification or anaerobic digestion to convert waste into useable forms of energy.
Water is Life Roadmap	The <i>Water is Life Roadmap</i> aims to create and maintain a careful and considered balance between Traditional Owner self-determination in water access and management, and the rights and entitlements of a range of stakeholders.
Water Cycle Climate Change Adaptation Action Plan	A Victorian Government strategy to manage the impacts of climate change on the water cycle system. The <i>Water Cycle Climate Change Adaptation Action Plan</i> guides statewide adaptation action and is updated every 5 years.
Water Industry Act 1994	Victorian legislation to provide for the reform of the water industry. The Essential Services Commission uses the framework for regulating the water sector to determine pricing of water services.
Zero emissions vehicles	A vehicle that does not produce any greenhouse gas emissions when running. They are powered by an electrically charged battery or a hydrogen fuel cell.

Abbreviations

ALC	Australian Lamb Company
ARENA	Australian Renewable Energy Agency
CH ₄	Methane
CO ₂	Carbon Dioxide
DEECA	Department of Energy, Environment and Climate Action
GHG	Greenhouse Gas
MW	Megawatt
N ₂ O	Nitrous Oxide
NGER	National Energy and Greenhouse Reporting
PFAS	Per- and Polyfluoroalkyl Substances
RON	Regional Organics Network
t CO ₂ -e	Tonnes of carbon dioxide equivalent greenhouse gas emissions



Credit: South East Water

deeca.vic.gov.au



Energy,
Environment
and Climate Action