Climate Change Office

State of Play Report: Tasmania's waste sector

November 2023

Renewables, Climate and Future Industries Tasmania
Department of State Growth

Tasmanian Government

In recognition of the deep history and culture of these islands, we acknowledge all Tasmanian Aboriginal people as the continuing Custodians of this Land and Sea Country and pay our respect to elders past and present.

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Executive summary

Reducing our emissions

Tasmania recorded net zero greenhouse gas emissions for the first time in 2013, and we have maintained our net zero status in the years since. However, our emissions profile is not guaranteed into the future, and we know we must do more to maintain our net zero status by reducing emissions in all our sectors, while also increasing the carbon stored in our forests.

Tasmania's legislated economy-wide target of net zero emissions, or lower, from 2030, provides a flexible approach to emissions reduction and acknowledges that different sectors have different opportunities to reduce their emissions. For some sectors, more time, support and technology will be needed to transition to a low emissions future. To ensure a practical and balanced approach to reducing emissions from our key sectors and building resilience to climate change, Tasmania's climate change legislation includes a requirement to develop sector-based Emissions Reduction and Resilience Plans (Plans).

The Plan for the transport sector is to be completed by November 2023, while all other Plans are to be completed by November 2024.

This State of Play Report has been prepared as the first step in the preparation of a Plan for the waste sector. It provides an overview of the waste sector in Tasmania to inform the identification of gaps and future opportunities for the draft Plan, which is expected to be released for public consultation later in 2023.

Tasmania's waste sector

The waste sector is essential to the Tasmanian community, managing the state's household, commercial and industrial waste and recycling, and the treatment of wastewater.

The waste sector currently accounts for around 5 per cent of Tasmania's greenhouse gas emissions, excluding land use, land use change and forestry (LULUCF).

The main sources of emissions from the sector are from organic waste in landfills and the treatment of wastewater. Our manufacturing, commercial and municipal solid waste streams are the largest contributors to organic waste in landfill and present important opportunities for reducing emissions.

The most efficient ways of reducing emissions from the sector are to reduce the generation of organic waste, followed by options for diverting the waste we do generate through reuse, recycling and recovering to create compost, mulch, bioenergy and other products.

There are many initiatives underway at an international, national, state and local government level working towards an international target to reduce food waste by 50 per cent by 2030.

Background

Tasmania's *Climate Change (State Action) Act 2008* (the Act) sets out how the government must take action on climate change. Under the Act, Tasmania's emissions reduction target is to achieve net zero greenhouse gas emissions, or lower, in Tasmania from 30 June 2030. To help us achieve this goal, the Act requires the government to develop five-yearly sector-based Plans in consultation with business and industry. The Plans will support a practical and balanced approach for our key sectors to reduce greenhouse gas emissions and build resilience to climate change.

The Plans must support greenhouse gas emissions reduction, the transition to a low emissions economy, and resilience to climate-related risks. The legislation also requires that the objects of the Act are taken into account during the development of the Plans.

Plans must be developed for the following sectors:

- energy
- transport
- industrial processes and product use (IPPU)
- agriculture
- land use, land use change and forestry (LULUCF)
- waste
- any other sector or sub-sector determined by the Minister (the government has committed to develop a Plan for government operations).

Delivery and timeframes

Under the Act, the Plan for the transport sector must be prepared by November 2023, and all other Plans by November 2024. The Minister for Environment and Climate Change is to consult with each relevant portfolio Minister, and with business and industry representatives, to develop the Plans. The Minister is also required to publicly consult on each draft Plan.

The Plans are to be tabled in Parliament and updated at least every five years. This work is being led by the Climate Change Office in Renewables, Climate and Future Industries Tasmania (ReCFIT).

Why sector-based emissions reduction and resilience planning?

The latest data[1] show that Tasmania recorded net zero greenhouse gas emissions for the first time in 2013 and has maintained its net zero status in the nine reported years since. Our emissions profile is largely due to the carbon sink in our managed forest estate and our longstanding investment in renewable electricity generation.

However, our emissions profile is not guaranteed into the future. Emissions are influenced by a range of factors such as population growth, major bushfire events, changes in consumer demand, market forces and technological advancements. We know we must do more to maintain our net zero status by reducing emissions in all our sectors, while also increasing the carbon stored in our forests.[2]

The *AR6 Synthesis Report: Climate Change 2023* by the Intergovernmental Panel on Climate Change (IPCC)[3] confirms that humans are causing global warming and makes it clear that we need to act now. Global temperatures are now 1.1˚C above pre-industrial levels and are likely to reach 1.5˚C above pre-industrial levels in the early 2030s. In Tasmania, the impacts of climate change will have environmental, economic and social impacts on our businesses, industries, communities and our natural values. It is important that we adapt effectively to a changing climate and build strong, resilient communities, while continuing to reduce our emissions.

A consistent theme from consultation on the government's action on climate change is that a partnership approach between government and industry is the preferred approach to support emissions reduction and build resilience in Tasmanian businesses and industries.

Purpose of this State of Play Report

This State of Play Report (Report) has been developed to support the requirement to prepare a Plan for the waste sector and to guide consultation. This Report provides a high-level summary of Tasmania's waste sector, its emissions and the impacts of climate change on the sector. It also outlines emissions reduction and resilience opportunities and barriers, and relevant policies and actions at the local, national and international level.

This Report will inform the identification of gaps and future opportunities for the draft Plan, which will be released for public consultation in late 2023.

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[1] Tasmania's latest reported greenhouse gas emissions were released in April 2023 as part of the Australian Government's *National Greenhouse Accounts 2021* and *State and Territory Greenhouse Gas Inventories 2021*. The Australian Government reporting framework is consistent with UNFCCC and Paris Agreement reporting rules. National inventory reporting runs two years behind the current date, and represents the most recent official data in Australia on annual emissions.

[2] Point Advisory and Indufor (2021) '2021 Update of Tasmania's Emissions Pathway Review – technical report' (prepared for the Tasmanian Climate Change Office) https://recfit.tas.gov.au/__data/assets/pdf_file/0009/348948/Tasmanian_Emissions_Pathway_Review_-_Technical_Report.pdf

[3] IPCC (2023) 'Climate Change 2023: Synthesis Report - Summary for Policymakers' https://www.ipcc.ch/report/ar6/syr/

Framework for development of the Plans

Purpose	To develop pathways for key sectors to reduce greenhouse gas emissions that support Tasmania achieving its target of net zero emissions, or lower, from 2030, support the transition to a low emissions economy, and build resilience to the impacts of climate change.
Objectives	To identify priority actions for government, business and industry.
Principles	• Sustainable development and social equity • Transparency and reporting • Science-based approach • Integrated decision making • Risk management • Community engagement • Complementarity
Sectors	• Energy • Transport • IPPU • Agriculture • LULUCF • Waste • Any other sector or sub-sector determined by the Minister (the government has committed to develop a Plan for government operations)
Consultation	• Climate Change Reference Group • Portfolio Ministers • Targeted consultation with key industry stakeholders and government departments • Public consultation on each draft Plan
Timing	• Transport Plan to be developed by November 2023 • All other Plans are to be developed by November 2024 • The Plans will be progressively developed over the next 15 months, starting with transport, followed by waste, then energy and IPPU, and lastly agriculture and LULUCF
Key public outputs	• State of Play Report • Draft Plan • Final Plan
Next steps	• Implementation • Reporting through the annual climate change activity statement • Review of the Plans to identify gaps and opportunities for the development of Tasmania's next climate change action plan in 2025 • The Plans are to be updated at least every five years

Scope of the Plan for the waste sector

The sectors identified for the development of Plans are based on the sectors identified in the United Nations Framework Convention on Climate Change (UNFCCC) greenhouse gas reporting framework.

Under the UNFCCC reporting framework, emissions from the waste sector include emissions from:

- solid waste disposal (the decomposition of organic waste in landfills)
- incineration and open burning of waste
- biological treatment (composting and anaerobic digestion) of solid waste
- treatment and discharge of wastewater.

Tasmania has no reported emissions from waste incineration, and emissions from the biological treatment of solid waste are minimal. The Plan for the waste sector will focus on how we can reduce emissions from the disposal of organic waste and wastewater treatment in Tasmania.

The Plan will also consider how we can build resilience to the impacts of climate change on our waste management systems, and how the sector can be supported in the transition to net zero; for example, to implement resource recovery pathways for lithium-ion batteries used in electric vehicles and renewable energy infrastructure, such as wind turbine blades.

Out of scope activities and emissions

Due to the nature of the waste sector and the UNFCCC reporting framework, there is significant overlap between waste and other sectors. For example:

- emissions from the application of agricultural waste to agricultural land (landspreading), field burning of agricultural residues and manure management, are accounted for in the agriculture sector
- emissions from the management of forests and conversion of forest to other land uses, including from the burning and decay of cleared vegetation, are accounted for in the LULUCF sector
- the emissions reduction from use of bioenergy made using organic waste are accounted for in the energy sector
- emissions associated with the energy used to collect and treat waste are reported in the energy sector and transport sub-sector.

The waste-related emissions accounted for in other sectors will be managed as part of the relevant Plans. However, there may also be relevant opportunities in the Plan for the waste sector.

The future opportunities identified in the Plans for each sector will be combined and inform the development of Tasmania's next climate change action plan, to be released in 2025, including the identification of priorities and gaps not addressed through the development of the sector-based Plans.

Waste and resource recovery

We acknowledge that there are many other important considerations for the way we deal with waste and resource recovery more broadly, and that there is a significant amount of work underway by governments, industry, business and the community to reduce waste generation, improve resource recovery and move to a circular economy. A current initiative is the development of a Waste and Resource Recovery Strategy for Tasmania by the Waste and Resource Recovery Board.

Although not directly accounted for in the waste sector under the UNFCCC reporting framework, these initiatives can impact our emissions along the supply chain. For example, a 2023 report commissioned by the Australian Marine Conservation Society and WWF Australia estimated that plastic consumption accounted for more than 16 megatonnes of greenhouse gas emissions in Australia in 2020.[4] This figure includes emissions throughout the lifecycle of plastic, including its manufacture and transport through to recycling or incineration.

Image: Business Action Learning Tasmania

[4] Blue Environment (2023) 'Carbon emissions assessment of Australian plastics consumption – Project report' prepared for the Australian Marine Conservation Society and WWF Australia, https://www.marineconservation.org.au/plasticemissions/

Tasmania's waste sector

The waste sector is essential to the Tasmanian community, managing the state's household, commercial and industrial waste and recycling, and the treatment of wastewater.

The sector is undergoing significant change, driven by developments in Australia and overseas, and shifts in community expectations around waste management and concerns about the greenhouse gas emissions from waste. While waste management traditionally deals with the disposal stage in the lifecycle of products, there is now a push to move to a circular economy which aims to maximise the value, and use of materials and resources, at every stage in the lifecycle of a product or material.

Roles and responsibilities

The Tasmanian Government manages waste and resource recovery in partnership with local government, business and industry, the community and the Australian Government.

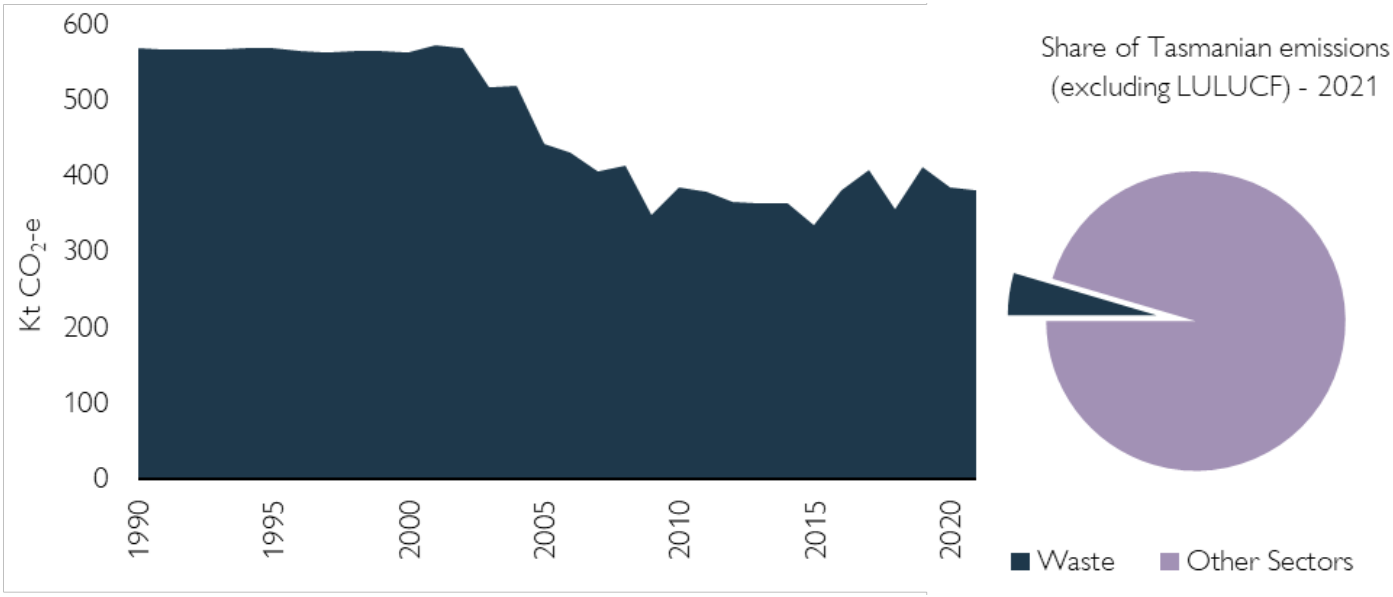
Entity	Key roles and responsibilities
Tasmanian Government	The Department of Natural Resources and Environment Tasmania (NRE Tas) delivers strategic policy and investment for waste management and resource recovery in Tasmania.
Environment Protection Authority (EPA)	The EPA regulates Tasmania's industrial and fish farming activities, municipal operations, such as wastewater treatment plants, and the state's larger waste facilities, including organic and controlled waste.
Waste and Resource Recovery (WRR) Board	Key roles of the WRR Board include developing a waste and resource recovery strategy for Tasmania, promoting and supporting resource recovery across the state, promoting market and local infrastructure development, and overseeing the use and allocation of landfill levy funds.
Local government	Local governments manage a significant proportion of waste produced and disposed in landfills in Tasmania and are actively involved in creating opportunities for waste reduction and resource recovery. Tasmania has three regional waste management groups, which are committed to working closely with the WRR Board and supporting the strategic resource management and emissions reduction targets in Tasmania.
TasWater	TasWater provides water and sewerage services to homes and businesses across Tasmania. TasWater sources, treats, and delivers reliable water to its customers as well as collecting, transporting and treating sewage before safely returning it to the environment. TasWater is owned by Tasmania's 29 councils together with the Tasmanian Government.
Business, industry and the community	There are several private waste transport and processing services in Tasmania including facilities for composting, rendering, landspreading and mulching organic waste. Business, industry and the community all play a role in producing and reducing waste, and developing and adopting resource recovery solutions, from food rescue to generating bioenergy.

Greenhouse gas emissions

Tasmania's waste sector accounted for approximately 5 per cent (381 kilotonnes (kt) of carbon dioxide equivalent (CO_2-e)) of Tasmania's emissions in 2021, excluding the LULUCF sector.[5]

Emissions from the waste sector have decreased by 33 per cent since 1990. This has largely been driven by increased landfill diversion rates and gas capture at wastewater treatment sites and landfills. These changes offset the emissions associated with increased waste generation due to population and economic growth.

Figure 1: Tasmanian waste sector emissions - 1990 to 2021



Source: Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2023, State and Territory Greenhouse Gas Inventories 2021

Sources of greenhouse gas emissions for the waste sector

Solid waste disposal

When organic waste decomposes in landfills, this process (called anaerobic decomposition) creates biogas, a gas comprising approximately half methane and half carbon dioxide. The methane emissions are attributed to the waste sector, however the carbon dioxide emissions are not reported as they are considered to be part of the natural carbon cycle.[6] There are eight landfill methane capture projects for either flaring (burning) or electricity generation in Tasmania, registered under the Australian Government's Emissions Reduction Fund.

[5] Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW) (2023) 'State and Territory emissions' https://www.greenhouseaccounts.climatechange.gov.au/

[6] DCCEEW (2023) 'Australian National Greenhouse Accounts Factors: For individuals and organisations estimating greenhouse gas emissions' https://www.dcceew.gov.au/sites/default/files/documents/national-greenhouse-accounts-factors-2022.pdf

Biological treatment of solid waste

Rather than decomposing in landfill, solid organic waste can instead be composted (a form of aerobic decomposition that does not release methane) or undergo anaerobic digestion in an enclosed biogas facility. These are categorised as the biological treatment of solid waste.

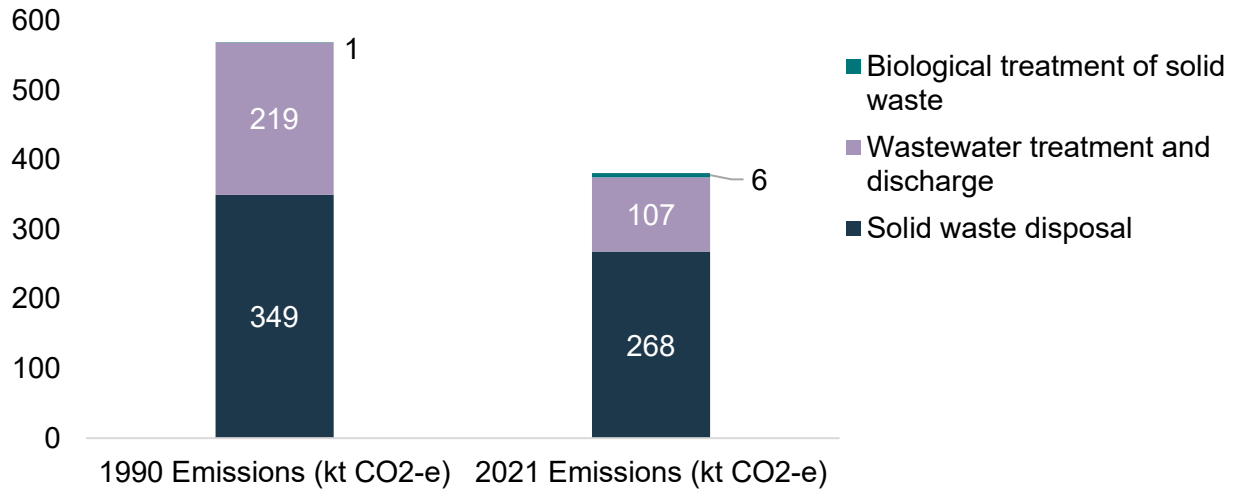
While anaerobic digestion generates biogas, it is often recovered and combusted to create energy, and can substitute for more emissions-intensive sources of generation reported in the energy sector. This process also creates digestate, which has many uses, including as fertiliser and for manufacturing bio-based products such as bioplastics. There are currently no enclosed solid waste biogas facilities in Tasmania.

Wastewater treatment and discharge

There are many treatment options for wastewater. Like solid organic waste, the anaerobic treatment of wastewater generates methane which can be captured and used for energy. Aerobic wastewater treatment generates nitrous oxide, another strong greenhouse gas.

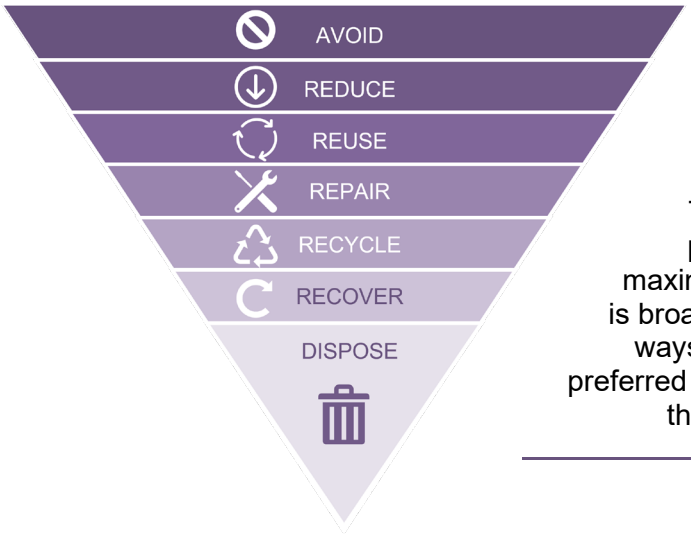
Due to these processes, the majority of emissions from the waste sector are methane. Methane traps significantly more heat (at least 28 times[7]) per tonne than carbon dioxide. Emissions for all greenhouse gases are reported as carbon dioxide equivalents, based on the warming caused by the gas over 100 years (this is the 'global warming potential' or GWP of each gas).

Figure 2: Tasmania's waste emissions by sub-sector - 1990 to 2021



Source: Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2023, State and Territory Greenhouse Gas Inventories 2021

[7] Australian Government Clean Energy Regulator (2022) National Greenhouse and Energy Reporting: Global warming potentials, https://www.cleanenergyregulator.gov.au/NGER/About-the-National-Greenhouse-and-Energy-Reporting-scheme/global-warming-potentials



The waste hierarchy

The waste hierarchy outlines waste management pathways in order of preference, with the aim of maximising the efficient use of resources. The hierarchy is broadly consistent with the most efficient and effective ways to reduce emissions from the sector, with the preferred option being to avoid the generation of waste and the least favourable option being disposal.

Factors influencing Tasmania's waste emissions

Emissions from the waste sector depend on a range of factors, including the amount and type of organic waste generated and sent to landfill, wastewater generation and treatment processes, and gas capture at landfills and wastewater treatment plants.

Organic waste generation

The more organic waste that is generated, the more it is likely to end up in landfill and contribute to the sector's emissions. Generation of solid organic waste and wastewater is historically broadly linked to population and economic growth. In 2020, Tasmania generated 812 kt of solid organic waste.[8]

Landfill rates

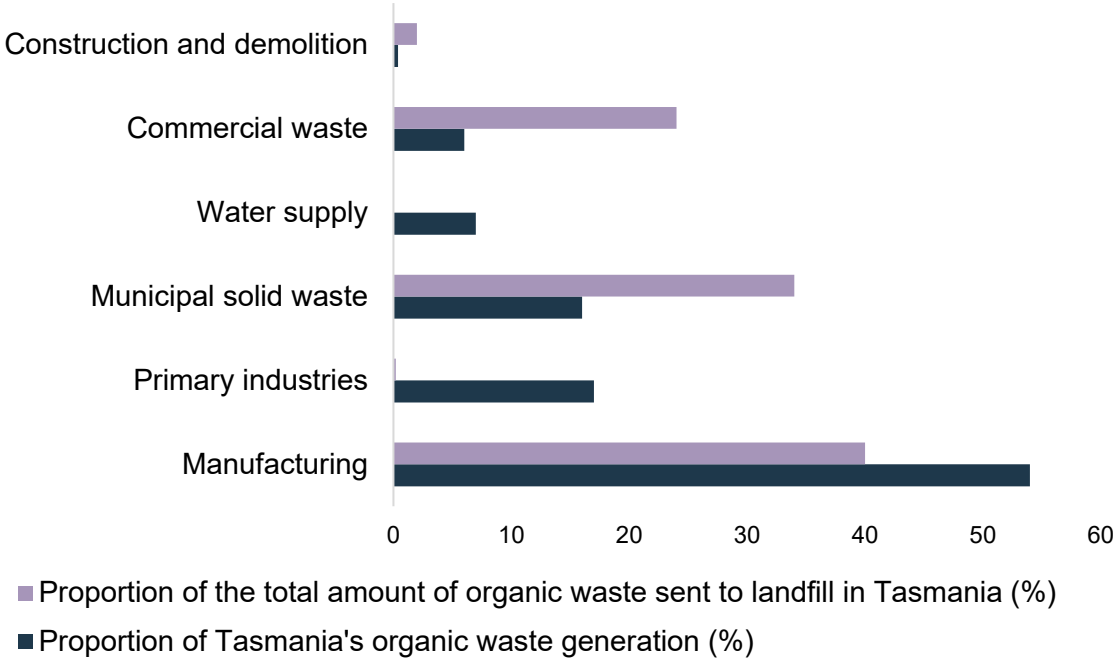
Approximately 21 per cent of Tasmania's solid organic waste is sent to landfill each year.[9] The material decomposes in landfill over several years, meaning emissions from solid waste disposal reflect waste disposal levels and composition over several decades. The emissions depend on the type of organic waste. For example, when sent to landfill, each tonne of food waste generates methane equivalent to over two tonnes of CO_2-e.[10] Paper and cardboard emit over 3.3 tonnes of CO_2-e per tonne.

[8] RMCG Consortium (2022) 'Tasmanian Organics Research Report: Final' prepared for NRE Tas https://nre.tas.gov.au/Documents/Tasmanian%20Organics%20Research%20Report%202022.PDF

[9] RMCG Consortium (2022) 'Tasmanian Organics Research Report: Final' prepared for NRE Tas https://nre.tas.gov.au/Documents/Tasmanian%20Organics%20Research%20Report%202022.PDF

[10] DCCEEW (2023) 'Australian National Greenhouse Accounts Factors: For individuals and organisations estimating greenhouse gas emissions' https://www.dcceew.gov.au/sites/default/files/documents/national-greenhouse-accounts-factors-2022.pdf

Figure 3: Tasmania's organic solid waste generation and landfilling by sector - 2020



Source: RMCG Consortium 2022, Tasmanian Organics Research Report: Final, prepared for NRE Tas

As shown above, the landfilling rates of organic waste vary significantly between sectors. For example:

- the construction and demolition industry produces very little organic waste
- the commercial sector (which includes food retailing, accommodation, hospitality, schools and other businesses) landfills the majority of its organic waste
- the manufacturing sector (which includes food, beverage, wood, textiles and paper) sends the majority of its waste to landfill and also redirects a proportion of its organic waste as animal feed, or manages the waste on-site (landspread, stockpiled or burned)
- primary industries (including agriculture, aquaculture and forestry) send a very low proportion of waste to landfill. Organic waste from these industries is sent to composting or mulching facilities or is managed on-site.

It is important to note that while the emissions from on-site waste management are not accounted for in the waste sector under the UNFCCC reporting framework, these practices materially contribute to Tasmania's emissions in the agriculture and LULUCF sectors. This will be considered as part of the development of the Plans for these sectors.

Household food and garden waste

In 2020, Tasmanians disposed of approximately 128 kg per person of organic waste through kerbside collection services. Almost half of this waste was food waste.

Municipal solid waste accounted for a disproportionately high volume of total organic waste sent to landfill in Tasmania (34 per cent, compared to 16 per cent of total organic waste generated).

Around 32 per cent of the kerbside organic waste in 2020 was composted or mulched.

There are several ways to reduce the amount of organic household waste sent to landfill, including changing the way we prepare and consume food, increasing home composting and expanding Food Organics Garden Organics (FOGO) kerbside collection.

FOGO collection has increased from 5 per cent of all Tasmanian households in 2018-19 to 44 per cent in 2020-21. This allows residents to include organic materials such as food scraps and garden waste in kerbside collection bins. The waste is collected and taken to composting facilities and transformed into compost. The compost is then used in agriculture and horticulture, storing carbon in Tasmania's soils.

Composting organic waste can reduce emissions by up to 80 per cent compared to landfilling.[11]

Wastewater

All urban areas and most major townships in Tasmania are connected to sewerage infrastructure. Wastewater is removed directly from households and treated by TasWater. Emissions vary depending on the treatment process used and are challenging to accurately quantify. Some treatment plants capture the gas and either flare it or generate bioenergy. The biosolids generated from the treatment process are nutrient dense and largely used by the agriculture sector as fertiliser or soil conditioner.

Some regions in Tasmania are reliant on domestic, on-site septic systems. Conventional septic systems use anaerobic digestion and produce large amounts of methane. However, they are generally cheaper to install and require less maintenance than aerated wastewater treatment systems (AWTS) and are therefore more common. AWTS produce less emissions and have better environmental outcomes.

Gas capture and bioenergy generation

Many landfill and wastewater treatment facilities have gas capture collection systems in place. These systems combust or flare the gases, converting the methane to less potent carbon dioxide.

Several facilities convert the methane gas into energy to power their operations, including the Launceston Waste Centre, McRobies Gully Waste Management Centre in South Hobart and the Jackson Street Waste Management Centre in Glenorchy. This not only reduces emissions from the waste sector, but also the transport and energy sectors when the biogas is used in place of fossil fuels.

[11] Perez, t, Vergara, S E and Silver, W L (2023) 'Assessing the climate change mitigation potential from food waste composting', *Scientific Reports,* https://www.nature.com/articles/s41598-023-34174-z

TasWater

TasWater has 11 sewage treatment plants that produce approximately three gigalitres of biogas per year through anaerobic digestion process.

TasWater uses the biogas to heat the sludge processed in anaerobic digesters, displacing the use of around 1 gigalitre of fossil fuels and preventing up to 2,000 tonnes of CO_2-e from being emitted to the atmosphere. It also saves TasWater around $2 million in fuel costs per year.

At TasWater's Macquarie Point sewage treatment plant, biogas is utilised in a cogeneration engine that generates up to 425 megawatt hours of electricity per year and the heat produced during the process is used for sludge heating. The electricity is used on site, providing approximately 50 per cent of the site's electricity requirements.

More information is available on the ReCFIT website at:
www.recfit.tas.gov.au/future_industries/bioenergy

Impacts of climate change on the waste sector in Tasmania

Under a changing climate, we are expected to experience increased storm events and changes in rainfall patterns, which are likely to result in increased flooding, coastal inundation and erosion. We are also expected to experience increased temperatures, more hot days and heatwaves, and longer fire seasons in Tasmania, with more frequent and intense bushfire events. We are expected to experience marine heatwaves, rising sea levels and increased windspeed. Extreme weather events are projected to increase in frequency and intensity over time. These events will have environmental, economic and social impacts on Tasmania's businesses, industries, communities and our natural and cultural values.

The projected changes to the Tasmanian climate will increase physical risks for waste management facilities; for example, events such as fires and floods. Some coastal landfill sites and wastewater treatment plants will also be impacted by coastal erosion. TasWater is also vulnerable to the impacts of climate change on water resources. These impacts and events can create significant costs for operators and create risks for public health and the environment, for example through the release of leachate (a liquid that forms when waste decomposes, containing toxic chemicals and materials).

Increased frequency and intensity of extreme weather events will also result in damage to infrastructure and property requiring management by the waste sector.

Risks for the sector in the transition to a low emissions economy

In addition to the physical impacts on Tasmania's waste sector, there are risks associated with the transition to a low emissions economy, such as the increased cost of compliance with changing regulations. The shift towards renewable energy will also eventually result in obsolete emissions-intensive technologies that will require disposal. Increased renewable energy will require development and expansion of resource recovery pathways for renewable technologies such as solar panels, lithium-ion batteries used in electric vehicles, and wind turbine blades.

Opportunities, challenges and barriers

Emissions reduction opportunities

In line with the waste hierarchy, the most effective opportunity for reducing the amount of organic waste sent to landfill and the associated emissions is avoiding the generation of this waste. However, there are other important opportunities to improve the way we manage the waste that cannot be avoided.

The Tasmanian Emissions Pathway Review estimated that reducing the volume of organic waste sent to landfill, together with the deployment of additional landfill gas capture technology, could reduce Tasmania's emissions by 0.60 Mt CO_2-e per year by 2050, a reduction of around 16 per cent of total current waste sector emissions.

The largest opportunities for diverting organic waste from landfill are in the manufacturing and commercial sectors and kerbside waste collection, as these sectors currently have high landfilling rates.

The landfill waste levy introduced in 2022 will provide funds to support a long-term, strategic approach to waste management and resource recovery in Tasmania. Funds will be invested in resource recovery and education and awareness programs.

The 2022 Tasmanian Organics Research Report[12] recommended focus areas and initiatives for reducing and managing organic waste in Tasmania. Key themes are outlined below.

Education and behaviour change

Education and awareness campaigns targeting households, business and industry can play an important role in both reducing waste and improving the reuse, recycling and recovery of the waste that is generated.

Topics may include reducing household food waste through different shopping, food preparation and storage methods, encouraging at-home or on-site composting, and education about what kinds of waste can be composted. It may also include programs to encourage business and industry to adopt alternative resource recovery pathways for organic waste such as partnering with food banks or businesses who generate bioenergy or biochar from organic waste.

Rethink Waste Tasmania

Rethink Waste Tasmania[13] provides information about waste avoidance and recovery services, events and news for all Tasmanians – ranging from what can be recycled, to how to compost food scraps and everything in between.

Their projects and education services follow the waste hierarchy and encourage Tasmania's transition to a circular economy.

Rethink Waste Tasmania is delivered in collaboration between Tasmania's Regional Waste Management Groups in partnership with the Tasmanian Government.

[12] https://nre.tas.gov.au/Documents/Tasmanian%20Organics%20Research%20Report%202022.PDF

[13] https://rethinkwaste.com.au/

Partnerships and collaboration

There are many groups and organisations involved in the generation and management of waste in Tasmania. The products that can be produced from organic waste, such as compost, biochar and bioenergy, also mean that there are many opportunities for collaboration between the generators of waste and other businesses and not-for-profits who can utilise these products.

As the WRR Board's Draft Tasmanian Waste and Resource Recovery Strategy notes, greater coordination will help capture the opportunities and value in the resources we have previously thrown away. Promoting strong partnerships to address priority issues is a key objective of the draft Strategy.

Stop Food Waste Australia

Stop Food Waste Australia[14] is a partnership involving organisations from across the food supply chain that are committed to halving Australia's food waste by 2030.

Stop Food Waste Australia has developed the Australian Food Pact[15], a voluntary agreement that brings together organisations to develop and share solutions and implement change at scale. Signatories to the Pact prevented 340,000 tonnes of food from being wasted in the first year of the Pact.

Stop Food Waste Australia has also developed sector action plans[16] for bread and bakeries, food rescue, dairy, horticulture, and the cold chain sector. Work is currently underway to develop plans with the hospitality and foodservice sectors, including work with cafes, catering companies, quick service restaurants, hospitals and aged care facilities.

Stop Food Waste Australia was recently awarded a grant by the Australian Government to establish a new nationwide consumer behaviour change campaign to reduce the amount of food wasted in Australian homes.

Investment in technology and infrastructure

It is important that Tasmania has the capacity to process the organic waste that is collected through kerbside collection services and directly disposed of at waste management facilities by the public. The Tasmanian Government has recently invested $6 million to increase organics reprocessing and composting capacity at waste facilities in the north and south of Tasmania.

Other opportunities include increasing gas capture technologies at landfills and wastewater treatment plants and supporting development technologies and infrastructure for the generation and use of biogas, biochar and other organic waste products.

[14] https://www.stopfoodwaste.com.au/about/

[15] https://www.stopfoodwaste.com.au/australian-food-pact/

[16] https://www.stopfoodwaste.com.au/sector-action-plans/

Policy and regulation

The introduction of a landfill waste levy is a key regulatory mechanism for diverting waste from landfill and stimulating investment in waste processing infrastructure. Other regulatory mechanisms being implemented or explored in other Australian jurisdictions and around the world include:

- introducing fines for organisations that send food waste to landfill
- incentivising the diversion of waste from landfill through tax rebates
- mandating landfill and wastewater gas capture
- requiring AWTS in new homes rather than conventional septic systems.

However, it is important that any unintended consequences of these measures are managed (for example, increased costs of landfilling may lead to increased illegal dumping of waste in the absence of measures to prevent this).

Co-benefits of reducing organic waste

Disposal of organic waste in landfill not only results in the generation of methane, but also in the landfilling of valuable resources that could be repurposed as other products, and cost households thousands of dollars each year. Co-benefits of reducing, recycling and recovering organic waste include:

- improving productivity and profitability in sectors such as horticulture, food manufacturing, retail and hospitality due to improved resource efficiency and lower waste disposal costs
- supporting new industries for alternative uses of organic waste
- saving Tasmanian households up to $2,500 a year[17] by helping them to reduce the amount of food wasted at home
- reducing emissions from other sectors such as transport and energy through the use of bioenergy made from organic waste
- reducing air and pollution from landfills, benefiting public health and the environment
- improving soil health and increasing agricultural productivity through the use of compost
- increasing Tasmania's food security due to the redistribution of edible food.

[17] Food and Agribusiness Growth Centre (2021) 'The National Food Waste Strategy Feasibility Study – Final Report' https://www.fial.com.au/sharing-knowledge/food-waste

Business Resource Efficiency Program

The Tasmanian Government, through the Climate Change Office, has supported two rounds of the Business Resource Efficiency Program (BREP),[18] delivered by Business Action Learning Tasmania.

BREP supports businesses to reduce emissions and adopt innovative practices. The program can assist businesses to manage financial and climate risks and strengthen their competitive advantage in the transition to a low emissions economy.

Across two rounds, BREP has supported 26 small and medium-sized organisations in Tasmania to improve resource efficiency and reduce waste.

Resources and tools have been developed which summarise the key program learnings and outcomes to help other businesses improve their resources and efficiency. The resources are available on the ReCFIT website at: www.stategrowth.tas.gov.au/recfit/business_resource_efficiency_program

Resilience opportunities

The opportunities to increase the resilience of waste and wastewater management facilities to the impacts of climate change will depend on the risks for each facility. Most options are extremely costly and include installation of infrastructure to protect sites from fire or flood, removing toxic materials from at-risk sites to prevent them from entering the environment in the case of extreme weather events or coastal erosion, and relocation of at-risk facilities.

Tasmania's first statewide climate change risk assessment is currently being developed, and a project is underway to update the fine-scale climate projections for Tasmania. These projects will improve our understanding of the risks to waste and wastewater management sites to assist in identifying priority sites and adaptation measures.

The global transition to net zero emissions also presents opportunities for Tasmania's waste sector. This includes the potential to generate income through the sale of carbon credits from projects that reduce emissions and/or generate bioenergy, and through the sale of products such as compost and bioenergy. Use of bioenergy on-site can also reduce costs for landfill operators.

Challenges and barriers

Tasmania historically has a lack of clear and comprehensive statewide information on product supply chains, recyclable materials, and waste flows, which has limited the ability to identify priorities and strategic investment opportunities in the waste and resource recovery sectors. Work is underway to address these issues. For example, the *Waste and Resource Recovery Act 2022* and associated Regulations establish reporting requirements for operators of landfills and resource recovery facilities. A key action in the draft Tasmanian Waste and Resource Recovery Strategy is to establish and maintain efficient data collection and public reporting systems. The Tasmanian Government's Waste Data Readiness Grant Program supports landfill operators to modify their business systems and infrastructure to comply with the new legislative requirements.

There have also been concerns that inadequate resource recovery infrastructure in the state may limit the capacity of members of the community and industry to repair and reuse products and recycle materials. The Tasmanian Government has announced significant investment in resource recovery

[18] https://businessactionlearningtas.com.au/brep/

infrastructure in recent years, including to increase Tasmania's organic waste reprocessing and composting capacity.

Tasmania's smaller economies of scale and relative isolation compared to other Australian jurisdictions also create challenges, and it is important that initiatives are managed in a way that maintain the viability of commercial operations and support the adoption of national measures such as product stewardship programs.

For business and industry, the emissions from organic waste that is disposed to landfill or wastewater sent to TasWater for treatment are classed as scope 3 emissions, meaning they are not directly attributed to the businesses that produce them. They are instead attributed as scope 1 emissions to the relevant waste management facility. Regulatory and financial mechanisms, such as the introduction of the landfill waste levy, can incentivise business and industry to divert waste from landfill.

In some local government areas, kerbside FOGO collection is not currently economically feasible. However, other options to reduce waste include supporting residents to compost organic waste, use as mulch or feed to animals such as chickens. This could be complemented with commercial FOGO collection and public FOGO bins.

Image: Business Action Learning Tasmania

Trends, targets and initiatives

International

International targets:

- halve global food waste per capita by 2030 (UN Sustainable Development Goal 12.3)
- reduce global methane emissions across all sectors by at least 30 per cent below 2020 levels by 2030 (Global Methane Pledge).

Other countries around the world have a range of measures and targets in place to reduce organic waste, for example:

- France introduced laws to prohibit supermarkets from destroying unsold or expired food products in 2016. Fines apply to organisations that destroy unsold food products that are fit for consumption, and food must instead be donated to food banks and food rescue organisations.
- Italy passed a similar law in 2016 that incentivises the donation and distribution of food nearing use-by dates through tax rebates.
- The Norwegian and Danish governments have signed voluntary agreements with food business operators to reduce food waste by 50 per cent by 2030, supported by measures such as changes to management of food nearing use-by dates and technologies to help businesses and consumers increase food efficiency.
- Japan has set a legislated target to halve its food loss and waste by 2030, supported by initiatives such as food banks to rescue edible food from food retailers and a focus on community education.

National

Australia's organic waste targets:

- halve the amount of organic waste sent to landfill by 2030
- halve food waste by 2030.

In 2018, Australian Environment Ministers recognised the need to respond to the challenges from recent changes in global waste markets.

Relevant policies and initiatives include:

- the *National Waste Policy and Action Plan*, which provides a framework for collective action by businesses, governments, communities and individuals until 2030, informed by circular economy principles
- the *National Food Waste Strategy,* which provides a framework to support collective action towards halving Australia's food waste by 2030
- the Australian Government's Food Waste for Healthy Soils Fund, which supports investment in organic waste recycling infrastructure to divert organic waste from landfill and into nutrient rich compost and other soil enhancers

- Environment Ministers from all jurisdictions agreeing to work with the private sector to achieve a circular economy by 2030, supported by the establishment of the Ministerial Advisory Group on the Circular Economy.

The Australian Government also regulates the accreditation of product stewardship schemes that support the environmentally sound management of products and materials over their life, including at the end of their useful life.

Tasmanian Government

Tasmania's organic waste targets:

- reduce the volume of organic waste sent to landfill by 25 per cent by 2025
- reduce the volume of organic waste sent to landfill by 50 per cent by 2030
- reduce food waste by 50 per cent by 2030.

Key measures to improve waste and resource recovery in Tasmania, with a focus on organic waste, include:

- Establishment of the WRR Board in 2022 to provide strategic oversight and drive a circular economy agenda.
- Introduction of a statewide landfill levy from 1 July 2022, both to encourage the diversion of waste from landfill and increase the recovery of resources from waste.
- Funding of $6 million to improve and increase FOGO reprocessing capacity across Tasmania. The funding has been allocated to the Dulverton Organics Transformation Organics Recycling Facility Upgrade in the north, and Barwick's Boyer In-Vessel Composting Facility in the south, both with additional Australian Government investment.
- Partnering with Tasmania's regional waste management groups to deliver the Rethink Waste initiative, providing a centralised source of information for communities and businesses on how to reduce waste.

Further information on Tasmania's progress with a range of waste and resource recovery initiatives across the state is available on the NRE Tas website at: https://nre.tas.gov.au/environment/waste-and-resource-recovery

The *Bioenergy Vision for Tasmania*[19] aims to embed bioenergy as a valued renewable resource for the Tasmanian economy, community, and environment as an aid to energy production, waste management and resource recovery, and reduction of greenhouse gas emissions.

The government is currently updating *Tasmania's Population Strategy*[20] to focus on sustainable growth, as well as ensuring services and planning can support this growth.

[19] www.recfit.tas.gov.au/future_industries/bioenergy

[20] https://www.stategrowth.tas.gov.au/policies_and_strategies/populationstrategy

Waste and Resource Recovery Board

The WRR Board released the *Draft Tasmanian Waste and Resource Recovery Strategy 2022-25*[21] for public consultation in December 2022, and the final Strategy is currently under development. The WRR Board's targets are consistent with the Tasmanian Government targets.

The Strategy identifies objectives to divert waste from disposal at landfill facilities, maximise resource recovery, and improve waste management practices in Tasmania. It recognises the work already underway by individuals, communities, businesses and governments across Tasmania, and aims to improve coordination and planning to help position Tasmania to take advantage of the global shift towards circular and sustainable economic systems. Further information on the WRR Board and development of the Strategy can be found at: www.wrr.tas.gov.au

Local government

Specific actions and targets to reduce emissions from waste and build resilience for the sector vary across Tasmania's 29 councils and depend on a range of factors, including location, population and infrastructure in local government areas. For example, a number of local government areas have introduced FOGO collection services in recent years or have announced an intention to do so. In other local government areas, alternative options to reduce organic waste to landfill are being explored.

The Cradle Coast Waste Management Group's (CCWMG) *Strategic Plan 2023-28*[22] sets out four key strategic focus areas and action sectors for the region. The key performance indicators include establishing regionally-consistent practices for waste management in all member council areas, 60 per cent municipal solid waste resource recovery, less than 10 per cent contamination rate in kerbside recycling bins, and phasing out priority single-use plastics by 2028. Many of the CCWMG's seven member councils have implemented their own waste management strategies that include specific actions to meet this target.

The Northern Tasmanian Waste Management Program (NTWMP)[23] currently has an Interim Strategic Plan which supports the goals of the WRR Board and will be in place whilst the next five-year plan is developed, following the completion of its most recent plan in 2022. The new strategy will focus on improving circular economy capacity, reducing contamination in FOGO collections, and community involvement in resource management. NRM North coordinates the NTWMP and has a well-developed understanding of circular economy and environmental outcomes of carbon emissions. The region currently has four councils with FOGO collection services and will be encouraging the continued increase of this service over time.

The Southern Tasmanian Regional Waste Management Authority enables the 12 southern councils to work cooperatively on waste management, landfill diversion and resource recovery projects. Many of these councils have implemented their own strategies, such as the City of Hobart's *Waste Management Strategy 2015-30*[24], which aims to achieve zero waste to landfill by 2030.

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[21] https://wrr.tas.gov.au/Documents/Draft%20Waste%20Strategy%202022%20-%20final.pdf

[22] https://rethinkwaste.com.au/wp-content/uploads/2023/01/Cradle-Coast-WMG-strategic-plan-2023-28-Final.pdf

[23] https://nrmnorth.org.au/sustainability

[24] https://www.hobartcity.com.au/files/assets/public/v/1/strategies-and-plans/city_of_hobart_waste_management_strategy_2015-2030.pdf

TasWater

TasWater's long-term environmental objectives include:

- achieving net zero greenhouse gas emissions by 2050
- producing 30 per cent of its energy demand onsite from renewable sources.

TasWater plans to reduce greenhouse gas emissions by implementing new technology and modifying current treatment processes, as well as harnessing emissions for beneficial purposes such as the production of electricity. However, the complete elimination of greenhouse gas emissions from wastewater treatment is currently not technically feasible.

TasWater will work with its customers and communities to balance the costs of achieving net zero emissions with affordability for customers and the cost of emissions impacting future generations.

Business, industry and the community

Different businesses and industries have a range of targets and initiatives to reduce organic waste. For example:

- The Tasmanian Hospitality Association's *Hospitality 2030* outlines a vision for Tasmania's hospitality industry in 2030. The vision includes a goal to create sustainable and profitable businesses, with organic waste identified as a priority.
- The Australian Retailers Association has developed a Net-Zero Roadmap as part of its *Climate Action Plan*. It includes a focus on improving circularity and reducing waste to landfill, with a target to reach net zero emissions from residual waste to landfill by 2050.
- Through Stop Food Waste Australia's *Australian Food Pact*, signatories include Coles, Woolworths, Mars Australia, McCain Foods and Simplot Australia, who have committed to halve food waste by 2030.
- Tasmania's primary industries also have initiatives underway, such as Huon Aquaculture's targets to achieve 100 per cent reuse of fish by-product across the entire production cycle and 100 per cent reuse of fish waste solids from freshwater operations. Initiatives include reusing waste for pet food and treats, compost, and on farmland.

Not-for-profit organisations and the community are also working to reduce organic waste. For example, Eat Well Tasmania's *Too Good to Waste* campaign partners with Tasmanian chefs and producers to help Tasmanians reduce the amount of food they waste in their homes and enjoy more seasonal local produce. The initiative was supported by the Tasmanian Government through the first round of the Healthy Focus grants program.

Glossary

Term	Description
Aerobic	Aerobic means 'with oxygen'.
Anaerobic digestion	A process through which bacteria break down organic matter in the absence of oxygen, producing biogas and digestate.
AWTS	Aerated Wastewater Treatment Systems
Biofuel	A fuel that is derived from biomass (plant, algae or animal material).
Biogas	Gas created from the anaerobic decomposition of organic matter (plant, algae or animal material). Biogas is principally a mixture of methane and carbon dioxide.
Bioenergy	A form of renewable energy produced using biomass (plant, algae or animal material). Bioenergy can include electricity, heat, gas and transport fuel.
Biological treatment	Biological treatment of solid waste or wastewater uses bacteria and other organisms to break down the waste. This can be done with oxygen (aerobic) or without oxygen (anaerobic).
Biosolids	Biosolids are a by-product of the wastewater treatment processes. They are commonly used in agriculture, for example as fertiliser.
Circular economy	A circular economy aims to maximise the value and use of materials and resources at every stage of the lifecycle of a product or material, for example through sharing, repairing, reusing, and recycling.
Compost	Compost is a product created by the breakdown of organic matter such as food and garden waste. It is rich in nutrients and can be used to improve soil quality.
Composting	Composting is an aerobic process (meaning there is oxygen present) which breaks down organic matter such as food and garden waste. This process principally produces carbon dioxide.
CO_2	Carbon dioxide; a greenhouse gas.
CO_2-e	Carbon dioxide equivalent. This is a standard unit to measure greenhouse warming potential of gases. Each different greenhouse gas is represented in terms of the amount of CO_2 that would create the same amount of warming.
DCCEEW	Australian Government Department of Climate Change, Energy, Environment and Water
Digestate	Digestate is a by-product of anaerobic digestion. It has many uses including as fertiliser and manufacturing of bio-based products such as bioplastics.
Direct combustion	Burning of fuel(s) for energy, predominantly in manufacturing, mining, residential and commercial sectors.
Diversion from landfill	Diverting waste away from landfill for another purpose, such as reuse or recycling.
Emissions	Greenhouse gas emissions.
EV	Electric vehicle.

Term	Description
FOGO	Food Organics and Garden Organics. This term is usually used in the context of FOGO kerbside collection services.
GWP	Global warming potential. Global warming potentials (GWPs) are values that allow direct comparison of the impact of different greenhouse gases in the atmosphere by comparing how much energy one tonne of a gas will absorb compared to one tonne of carbon dioxide.
IPCC	Intergovernmental Panel on Climate Change, an independent body that assesses the scientific, technical and socioeconomic information relevant for the understanding of the risk of human-induced climate change. This includes developing guidelines for national greenhouse gas inventories which are used under the UNFCCC.
IPPU	Industrial Processes and Product Use.
Kerbside collection	The collection of waste (usually in a wheelie rubbish bin) from residential properties.
kt	Kilotonnes. A kilotonne is equivalent to 1,000 tonnes or 1 million kilograms.
Landfilling	Disposing of waste in a landfill site (also called a tip).
Landspreading	Spreading organic waste across land, generally to act as a soil conditioner.
Leachate	Leachate is a liquid that forms when waste decomposes. It contains chemicals, organisms and the materials that are toxic to both humans and the environment.
LULUCF	Land Use, Land Use Change and Forestry.
Methane	A type of greenhouse gas, which contributes approximately 28 times more atmospheric warming than carbon dioxide.
Mt	Megatonnes. A megatonne is equivalent to 1,000 kilotonnes or 1 million tonnes.
Municipal solid waste	Organic waste collected in all kerbside bins and green waste disposed of by the public at transfer stations.
Nitrous oxide	A type of greenhouse gas, which contributes approximately 265 times more atmospheric warming than carbon dioxide.
NRE Tas	Department of Natural Resources and the Environment Tasmania
Organic waste	Waste that comes from plant or animal sources, including garden waste, food waste, paper and cardboard.
ReCFIT	Renewables, Climate and Future Industries Tasmania
Resource recovery	Resource recovery is the process of recovering materials from waste to: • reuse the waste • recycle the waste • recovery energy from the waste for use as an alternative to fossil fuel (bioenergy).
STGGI	State and Territory Greenhouse Gas Inventories
t	Tonnes. 1,000 kilograms.
UNFCCC	United Nations Framework Convention on Climate Change

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