



# DISCUSSION PAPER: WASTE TO ENERGY

This discussion paper is part of consultation on the draft **Waste and Resource Recovery Strategy 2030**. We are seeking views via our website at [participate.melbourne.vic.gov.au/waste-resource-strategy](https://participate.melbourne.vic.gov.au/waste-resource-strategy)

Recovering energy is one option for managing waste. Energy recovery is typically through thermal or biological processing. Each type of technology has different input materials, outputs (heat, electricity, gas etc.) and residual materials. The main technology types are outlined on page two.

Modern landfills such as that used by City of Melbourne also have a form of energy recovery by capturing methane gas emanating from the landfill and burning this for energy. This is a relatively inefficient way of generating energy. Other alternatives to landfill include advanced sorting technologies. Methane capture and sorting are not the focus of this discussion paper.

## What are the current issues?

**Environmental benefits** – energy recovery from waste reduces greenhouse gas emissions through avoiding methane that is generated in landfill and by reducing the amount of electricity that needs to be generated using fossil fuels.

**Land use** – Reducing the amount of material disposed to landfill means less land is required for landfill.

**Required standards** – The Victorian EPA requires that waste to energy facilities must incorporate measures to ensure air quality and protection of land and water. The residual material produced by some facilities may require disposal to a specialised landfill.

**Facility size** – Large scale waste to energy facilities can process upwards of 100,000 tonnes per year. Smaller facilities are also available.

**Relative cost** – Cost estimates for processing residual waste at a waste to energy plant vary widely, from 1.2 to 4 times the current landfill cost.

Photo credit: The State Government of Victoria  
DELWP (2017)

Technology	Feedstocks	Outputs	Residues
Thermal:			
Combustion	Mixed residual MSW, mixed C&I and C&D wastes, refuse derived fuels (e.g. Pellets manufactured from residual materials)	Heat, electricity, (Bottom ash residues may in some circumstances have value as road base or as an additive in building blocks)	Bottom ash, fly ash, air pollution control residues, metals
Gasification	Typically refuse derived fuel (RDF) prepared from mixed residual MSW, mixed C&I and C&D wastes, organic waste	Heat, electricity, syngas, (see above re Bottom ash)	Bottom ash, air pollution control residues
Pyrolysis	Homogenous feedstocks from sorted C&I + C&D waste (e.g. wood, tyres), sorted residual MSW (e.g. plastics), organic waste	Syngas, biochar (when biomass used as feedstock), pyrolysis oil to make liquid fuels	Air pollution control residues
Biological:			
Mechanical Biological Treatment	Residual MSW, C&I waste, organic waste	Biogas, electricity, refuse derived fuels, separated recyclables (eg. plastics, paper, glass, metals), compost-like material – depending on technology configuration	Process water, air pollution control residues, inert materials and residual materials that have no economic value
Anaerobic Digestion	Biosolids, food waste, green waste, crop residues	Digestate, compost, heat, electricity, biogas	Liquid residues, wastewater, inert and non-compostable material, contaminants (e.g. plastics)

Table reproduced from: The State Government of Victoria DELWP (2017) Turning waste into energy. [www.environment.vic.gov.au](http://www.environment.vic.gov.au)

What are other cities doing?

**City of Sydney** proposed an Advanced Waste Treatment Master Plan in 2014 to convert non-recyclable waste into gas. They are yet to identify a site that is suitable for this technology that is accessible to the city and has the right connections to the gas and electricity grids.

**Europe** - The Confederation of European Waste-to-Energy Plants identifies 500 plants across 23 European countries. Many European countries use waste-to-energy as a means of reducing their waste to landfill. For example, Germany recycles or composts 68 per cent of their waste and uses the remaining 32 per cent to generate energy.

What should be done to address these issues in Melbourne?

City of Melbourne is working with the Metropolitan Waste and Resource Recovery Group to establish the business case for Advanced Waste and Resource Recovery Technology facilities and has partnered with City of Port Phillip and South-East Water to investigate the feasibility of a Sustainability Hub, including advanced waste technologies, in Fishermans Bend.

Funding for Advanced Waste and Resource Recovery Technology facilities (which may include waste to energy plants) should be made available by the Victorian Government from landfill levy funds.

What if?

A network of waste to energy plants was established across metropolitan Melbourne to process the material that is currently being disposed to landfill. Local governments across metropolitan Melbourne continue to dispose residual waste to landfill. This would require new landfills to accommodate the extra one million tonnes of annual landfill capacity required by 2041-42.

We want your thoughts

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