



Melbourne Energy and Resource Centre (MERC)

Responding to community feedback in
early engagement

April 2023



1. Introduction

By 2046 Victoria is forecast to send an estimated 5.9 million tonnes of waste to landfill each year. That's enough to fill almost 5,000 Olympic size swimming pools or almost 8 MCG's every year. Cleanaway is committed to developing a sustainable alternative to landfill to manage residual waste.

Cleanaway is proposing to build a waste-to-energy facility in Victoria, named the Melbourne Energy and Resource Centre (MERC). It will use safe, proven technology that has been successfully used in cities across Europe, North America, Japan and many other developed countries. The MERC will comply with the Victorian waste-to-energy framework and regulations.

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Benefits Snapshot

The MERC will:

- Aim to divert up to 95% of the residual waste it receives from landfill.
- Generate over 40 megawatts of electricity that will power over 70,000 homes.
- Recover an estimated 10,000+ tonnes of recyclable metals every year.
- Create 800 jobs during construction and 50 highly skilled jobs for on-going operations and maintenance.
- Support Victoria's transition to a circular economy by recovering resources that will otherwise be buried.
- Support Victoria's transition to net zero Greenhouse Gas (GHG) emissions, by reducing landfill gas emissions and producing electricity from non-recyclable waste.



Engagement so far

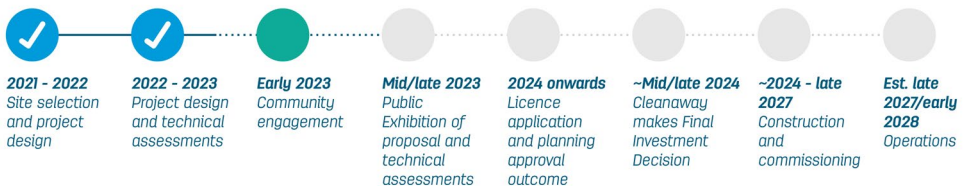
Since 2021, Cleanaway has been consulting with key stakeholders including regulatory bodies, local Councils, adjoining landowners, Traditional Owners, Industry and non-regulatory government agencies. A project website was launched in December 2022.

In 2023, Cleanaway will engage with the local community and provide multiple opportunities for the community to ask questions and seek further information about the Proposal.

This document provides a brief introduction to the MERC Proposal and presents responses to community feedback received during the first phase of engagement.

Cleanaway is committed to supporting the local community to understand the MERC Proposal. Information about the Proposal will be continuously updated to reflect the latest responses from Cleanaway to the key themes raised by the community throughout the engagement process.

Where are we at in the process?



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2. Waste-to-energy

What is waste-to-energy?

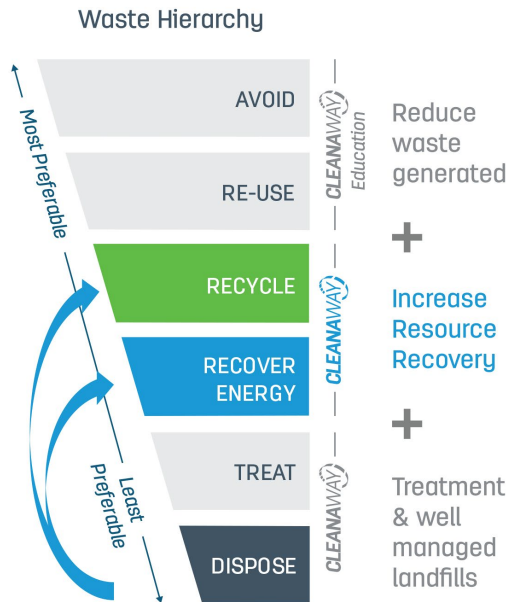
Waste-to-energy is a thermal treatment of residual waste that results in the recovery of energy and other resources. The MERC aims to better manage residual waste by using waste-to-energy technology to treat waste that would otherwise be disposed of in a landfill.

Why do we need waste-to-energy?

The waste hierarchy preferences higher order solutions for the waste we generate.

Our priority is to avoid producing waste in the first place. Where this is not possible, we seek to reduce the amount of waste created and then to pursue the highest order “reuse, recycling and recovery options” available in order to prolong and preserve the value of our finite resources at their highest value.

Even after the avoidance of waste, removal of recyclables and food and organics from general waste, Victorians will still





be sending over three million tonnes of waste to landfills each year if alternative solutions are not implemented.

Cleanaway supports Victorians by operating many waste recycling services in Victoria. We recycle food and garden organic waste, glass, paper, cardboard and plastic. Cleanaway also invests in education programs and supports innovative ideas to reduce waste.

To better manage waste, we need to find ways to work at higher levels of the waste hierarchy. The MERC proposal aims to do this by recovering energy from residual Municipal Solid Waste (general household waste bins), and residual Commercial and Industrial (C&I) waste that would otherwise be disposed in a landfill.

Waste-to-energy is only one tool in managing waste and should always be complimented with other waste management activities.

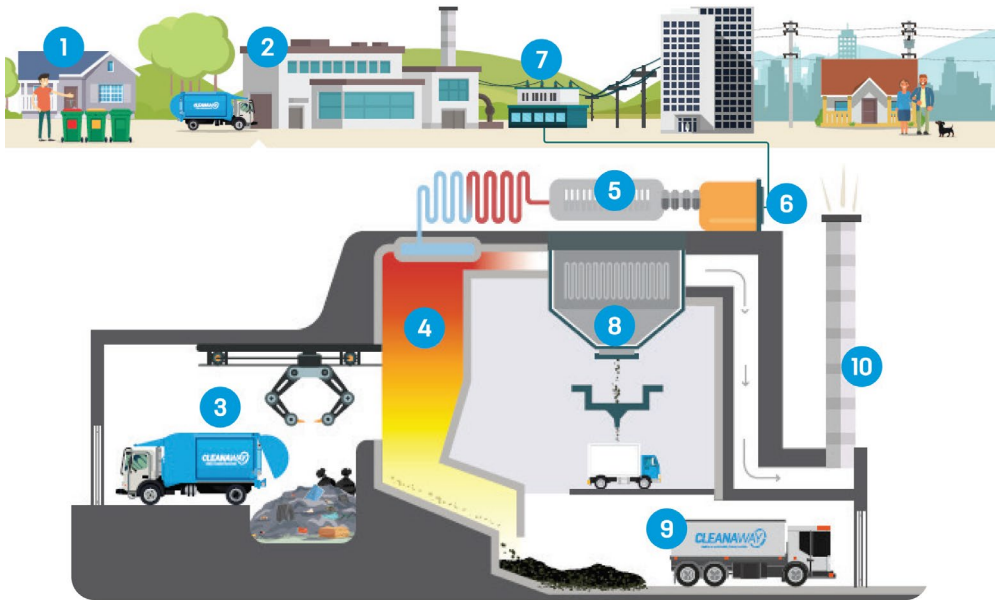
Cleanaway currently operates a range of waste management facilities which cover recycling and disposal. However, energy recovery and treatment will become more important as existing landfills are filled up and landfilling become a less desirable or viable option for waste management in the future.

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How does it work?



- 1 At home and work, we sort our waste into recyclable and non-recyclable items.
- 2 The non-recyclable items in the general waste bins will be sent to the MERC.
- 3 In the bunker, waste is mixed, ensuring consistency, by large crane claws before placement into the combustion chamber.
Waste is combusted for over an hour as it moves along the grate. This ensures that waste combusts completely. Flue gases are held above 850°C for at least two seconds to destroy organic pollutant and odour.
- 4 Water is heated in a boiler to recover energy from hot flue gas, creating steam that turns a turbine.
- 5 Electricity is generated.
- 6 Electricity is put back into the grid and used to power homes and businesses.
- 7 Gases created during combustion pass through a multi-step flue gas treatment system where lime and activated carbon are injected to remove pollutants from the gases. The solid residues and pollutant residues are collected in a sealed system for treatment before disposal.
- 8 Bottom ash from the combustion process is collected and stored. Metals are recovered for recycling, and the ash is sent for reuse in construction.
- 9 Cleaned gases are dispersed high into the atmosphere, mixing well to ensure no impact on surrounding air quality.
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Has the waste-to-energy technology been used in other countries?

Moving grate technology is used in many European and international waste-to-energy facilities processing mixed residual waste. This proposal referenced the technology used in existing waste-to-energy facilities that have been in operation for at least three years that are processing similar waste streams. The reference facilities are located in the United Kingdom.

In Australia, there are currently two waste-to-energy facilities under construction in Western Australia. Victoria currently has three approved waste-to-energy facilities however none have started construction yet.

What are the outputs from the MERC?

The MERC treats waste thermally at a high temperature. This process will turn waste into ash and flue gases that are cleaned prior to being safely released into the atmosphere.

Energy released in the thermal treatment process is recovered as high pressure and high temperature steam in a boiler that is integrated with the moving grate combustion system. This steam can be used as a heat source and/or used to generate electricity in a steam turbine generator. Like a fireplace, non-combustible materials remain and are recovered as bottom ash. After a maturation period (approximately 2-12 weeks) the bottom ash is sorted to remove recyclable metals and graded to meet civil construction material specifications for secondary and recycled aggregates. The air pollution control residues (APCr) will be treated and stabilised on site prior to being transported to landfill.

The illustration below summarises the key inputs and outputs from the MERC.



Key inputs



- Nearly all (99.9%) of the flue gas is oxygen, carbon dioxide, nitrogen and water vapour. The combustion byproducts (remaining 0.1%) are controlled to very low concentrations in accordance with stringent international best practice emission limits by dedicated cleaning systems employing best available techniques and technologies.
- Approximately 40 MW of gross electricity will be generated to support 70,000 homes.
- Approximately 95,000 tonnes (dry basis) per year of bottom ash from the combustion process will be collected and stored prior to processing on site. More than 10,000 tonnes per year of metals are expected to be recovered from the bottom ash for recycling. The bottom ash further processed to enable its reuse for construction purposes, which would allow the facility to divert approximately 95% of the incoming waste from landfill.
- Approximately 15,000 tonnes of Air Pollution Control residues will be collected in sealed silos. It is then treated on site to 'stabilise' the residue into cement-like blocks. The stabilised blocks will then be transported to an appropriate landfill for disposal.

How do you ensure that only non-recyclables will be treated?

The MERC must adhere to the Victorian Waste to Energy Framework (2021) which states that only residual municipal waste collected from a council that has at least a three-bin kerbside system in place and residual commercial waste that cannot be recycled can be accepted.

To ensure the quality of waste sent to the facility, Cleanaway will:

- Undertake pre-approval review and checking of waste to ensure it is suitable prior to acceptance.
- Conduct regular inspections of the waste feed at various stages of the process to confirm that waste deliveries are consistent with contractual requirements.
- Reject unacceptable waste deliveries.
- Undertake periodic waste sampling.
- Provide a clear contractual Waste Acceptance Protocol to suppliers outlining what waste is acceptable.
- Manage commercial waste collection routes to exclude wastes that are not classified as acceptable wastes under the Waste Acceptance Protocol.



Where would waste delivery inspections happen in the facility?

- When waste arrives at the facility waste trucks will be randomly selected for pre-inspection by MERC operations staff. These loads will be tipped in a dedicated inspection area inside the tipping hall to verify whether the waste delivery is suitable for thermal treatment.
- The waste crane operators will observe waste deliveries either directly or via CCTV. Waste which is too large or too long will be removed by crane from the waste bunker. An on-site shredder can be utilised to resize oversized waste materials that are suitable for energy recovery.
- Any waste that is unsuitable will be rejected from the facility and sent offsite for treatment and / or disposal.



3. Site Context



Figure 1 A map showing where MERC is located and surrounding land use

- **Proposed location:** 510 Summerhill Road, Wollert.
- **Site area:** 82ha*
- **Facility footprint:** 24ha*
- **Capacity of facility:** treat 380,000* tonnes of waste per year
- **Energy generation capacity:** 40* megawatts electricity generated to supply to the grid
- **MERC includes a visitor and education centre** to support waste education.
- **Nearby facilities:** an existing operational quarry; adjacent to an approved quarry; high voltage electricity transmission lines; a future wastewater treatment facility; a potential future gas-fired power station; and the existing Brickworks brick-making plant.

** all figures used are approximate values*

Why has this location been chosen?

Finding the right location has been a key consideration for this project. Cleanaway undertook a comprehensive assessment of over 200 potential sites in Victoria before determining that the proposed site is the most appropriate for development of the proposed MERC facility. This has been considered from an environmental, operations and location perspective with respect to separation from existing and planned future residential areas. The site has the following attributes:

- The site provides significant buffers between the proposed facility and existing and future sensitive land uses.
 - The proposed MERC is compatible with nearby existing and future land uses. Neighbouring activities include existing and proposed quarries, future sewage treatment works, potential future gas fired power station and existing industrial facilities such as the Brickworks factory.
 - Electricity transmission infrastructure is in place to allow energy produced to feed into the local electricity grid.
 - The site is centrally located within the Melbourne's northern corridor, allowing the MERC to receive waste deliveries from all parts of greater Melbourne. The site is located near to major arterial roads, allowing waste to be aggregated at existing transfer station infrastructure prior to transfer to the MERC. This is expected to reduce waste transportation from east to west, since two of the existing landfills with significant remaining operational life (i.e. Melbourne Regional Landfill and Werribee) are located on the west side of Melbourne.
 - Wollert is expected to have significant population growth within the next 10 years which will be supported through local job creation.
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How far is the facility from residential areas?

- The nearest residential areas are Shenstone Park Precinct (approximately 1.2km to the north), Mickleham (approximately 1.6km to the north-west), Craigieburn (approximately 3km to the west), Epping (approximately 2km to the south) and Wollert (approximately 2km to the east).
- There are a few closer residents living along Summerhill Road.



4. Site Management

Air quality

During preliminary consultation with randomly selected community members across Melbourne, we heard that you are most concerned about air quality control associated with waste-to-energy technology.

Waste-to-energy has been used as a method for thermally treating waste to recover energy and other resources for many years. Significant improvements in technology performance including combustion control, flue gas treatment and emissions monitoring have been realised over the past decades.

The MERC is proposing to use modern technology that is classified as Best Available Techniques under European Union legislation, and is used in numerous countries throughout the European Union, the UK, the USA and Japan. Many waste-to-energy facilities using similar technology meet stringent emission limits and are located within large population centres such as Tokyo, Singapore, London, Paris and other major cities around Europe.

An independent air quality assessment has been developed and will be submitted to the EPA to ensure the facility will not adversely impact the air quality and comply with all relevant regulations.

Cleanaway is committed to ongoing air quality monitoring and data will be published on the public project webpage.





What are the policies in place to control air emission?

Waste-to-energy facilities are highly regulated in Victoria. The MERC will be required to adhere to EPA's stringent air standards for managing air quality. Under EPA's Guideline for waste-to-energy proposals, the MERC must incorporate best practice measures for the protection of the environment, energy efficiency and greenhouse gas emissions management.

Consequently, the MERC will be required to comply with the air emission standards set by the European Industrial Emissions Directive and the associated Best Available Techniques Reference Document (BREF). The European standards are seen as the international benchmark for waste-to-energy, as they are backed by decades of reporting data and on-going technical research.

How will the site be accessed?

Trucks will enter the MERC via Summerhill Road. Light vehicles and visitors' cars will access the site from a separate dedicated access point to maintain separation from operational traffic.

Will the site be noisy?

The noise level emitted from the facility will vary over the day-time and night-time periods. Noise limits for day, evening and night periods at the nearest residential noise sensitive receivers have been established based on Victoria Environmental Protection legislation. The facility will be designed to meet the required noise limits.

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Will water from the facility be discharged to local waterways?

MERC will not discharge any process wastewater from the site during normal operation. To achieve this, the MERC will recover and store all process wastewater on-site for reuse. Stormwater will be collected and managed for reuse or attenuation on site.

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5. Architecture design and visual impacts

The MERC facility has been designed to reduce the visual impact to the surrounding landscape and local community. Design measures included:

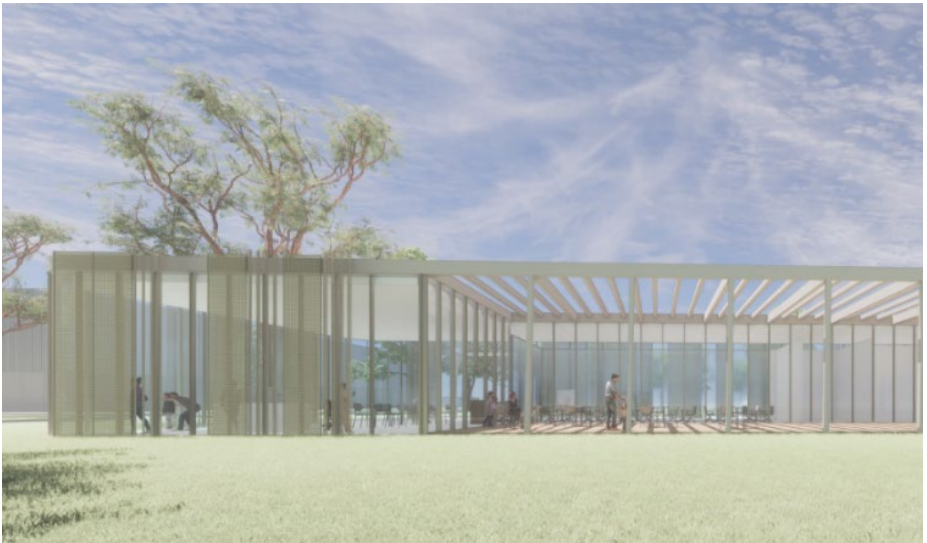
- Colours selected to blend in with the background and skyline to minimise visual impact.
- Trees, shrubs and earth mounds will be used to partially screen the building from the adjoining properties and Summerhill Road.
- Build earth mounds using site excavated materials to act as amenity and screening features, and sound dissipating elements.

Materials have been selected with consideration of sustainable procurement practices including its source, manufacturing processes, embodied carbon, life cycle and end of life strategy.



Visitor and Education Centre

A Visitor and Education Centre will be built as part of the MERC facility. This provides an opportunity for community members to visit and learn about waste-to-energy technology and other waste management, recycling and resource recovery related topics. Cleanaway is open to other ideas from the community about proposed uses for the centre.



Are there other things you would like to know more about MERC?

Email us at merc@cleanaway.com.au

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