METROPOLITAN WASTE AND RESOURCE RECOVERY GROUP

VICTORIA State Government

Advanced waste processing technical fact sheet

Vernéa Integrated Waste Treatment Facility, France

The information contained in this fact sheet has been provided by the procurement technical advisors - Arcadis and Fichtner.

Since 2019, a group of councils in Melbourne's south east have been working with the Metropolitan Waste and Resource Recovery Group (MWRRG) to seek proposals from industry for advanced waste processing solutions for household rubbish.

The procurement will deliver a vital alternative to landfill with strong environmental outcomes and is expected to attract multi-million dollar investment and create up to 400 temporary jobs during construction and up to 100 permanent operating jobs.

Advanced waste processing solutions have great potential as part of a total approach to managing the rubbish we produce. Alongside recycling, and separating food and green waste for composting, advanced waste processing is a smarter solution for household rubbish than burying it in the ground.

Waste to energy is the most common form of advanced waste processing technology, with hundreds of facilities operating safely and reliably throughout the world.

Meeting international safety standards

Advanced waste processing facilities are being used safely and reliably around the world, including in the United Kingdom, Europe, Asia and North America. Modern, best practice facilities have strong safety track records and are designed to meet strict emissions standards. These types of plants are sophisticated and by far the most developed for energy recovery for household rubbish.

The technology has been developed to a mature level where technical risks are low, and costs are well understood. As a result, modern facilities achieve the low emission levels required by the European Union's Industrial Emissions Directive (IED) and the updated Best Available Techniques (BAT) requirements.

The newest facilities in Europe and North America have sophisticated emission control equipment to minimise pollution including real-time emission monitoring. Facilities are inspected and tested regularly to ensure safety standards are achieved. Many of them outperform standards.

Regulating advanced waste processing

In Victoria, advanced waste processing facilities are regulated by the Environment Protection Authority Victoria (EPA). Any facility will need to be appropriately located, constructed and operated according to strict regulations to protect people's health and the environment.

The EPA's current *Victorian Energy from Waste guideline* has adopted the *European Commission Waste Framework Directive* methodology to determine if a facility is a 'recovery' or a 'disposal' facility based on energy efficiency criteria. Modern waste to energy facilities typically achieve the 'recovery' rating without difficulty, which means that they are a better option than landfill disposal.

To further regulate the industry, the Victorian Government has put a limit on how much rubbish can be processed through waste to energy facilities.

For more information see our factsheet – *Regulating advanced waste processing facilities*. The facility in Melbourne's south east will be constructed and operated according to best practice international standards.

How waste to energy technology works

Step 1

In a conventional waste to energy facility, waste is burned on a moving grate to produce very high temperature flue gases.

Many potential pollutants are eliminated by the very high temperatures reached during the combustion process, which limits the creation of emissions. This ensures the destruction of dioxins, furans, polycyclic aromatic hydrocarbons (PAHs) and other organics, and aligns with European Union safety requirements.

Step 2

Flue gases are cooled by a heat recovery boiler to create steam, which is then diverted to a steam turbine to generate power.

Step 3

The flue gases are cleaned by a flue gas treatment system before being discharged via a stack.

All combustion plants have extensive gas cleaning processes that remove dioxins, furans, acid gases, particulates and heavy metals from the flue gases before they are released.

Step 4

The main material left over from the waste to energy process is bottom ash - burnt-out residue made up of non-combustible material such as ceramics, metals, glass, rocks and dirt.

Typically the bottom ash falls into a water filled trough to cool and moisten to limit particulate emissions and to ensure an airtight seal to the furnace.

The bottom ash is transferred, typically by conveyor belt, to an ash bunker or other storage facility. Most transfer systems include metal separators to remove metals, such as steel, copper and aluminium, that are then generally sold to the scrap metal industry. This metal recovery allows recycling of materials that would otherwise be sent to landfill.

The remaining bottom ash can potentially be recycled for use in the construction industry as fill material, road base, concrete or brick making.

Step 5

Flue gas treatment residues are the second main type of residue generated in a conventional waste to energy facility. They are typically five per cent of the mass of the waste sent to the facility and are made up of small particulates from the combustion process and residue from flue gas treatment. They contain heavy metals and alkaline reagents and are normally considered hazardous waste. Therefore, they must either be disposed of in a hazardous waste landfill or reprocessed for potential use as an inert construction material.

Step 6

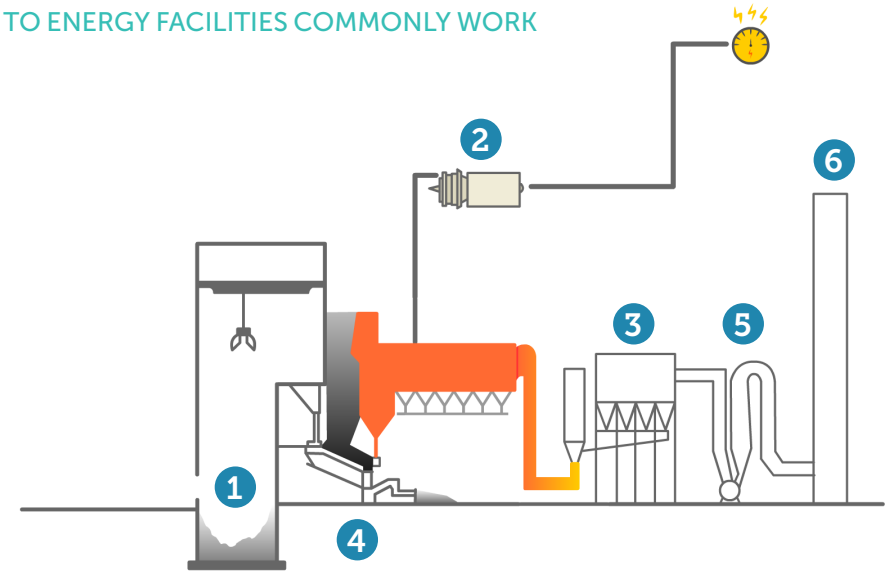
Emissions monitoring enables the control system to act if there is an issue. Continuous emission monitoring system will be installed and must comply with the requirements of the Australian National Association of Testing Authorities.

The continuous emission monitoring system typically monitors flue gas composition including:

- oxygen
- nitrogen oxides
- carbon monoxide
- ammonia
- volatile organic compounds
- particulates.

In addition to providing continuous online measurement of the emissions to the operator, the data can also be provided to the public to ensure transparency and will form part of the facility's reporting to the EPA. A back-up emissions monitoring system will also be provided that can be switched on automatically when needed.

HOW WASTE TO ENERGY FACILITIES COMMONLY WORK



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