



Waste to Energy Scheme

Guidance on the Scope of the Scheme

December 2024

Acknowledgment

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.

We are committed to genuinely partner, and meaningfully engage, with Victoria's Traditional Owners and Aboriginal communities to support the protection of Country, the maintenance of spiritual and cultural practices and their broader aspirations in the 21st century and beyond.



© The State of Victoria Department of Energy, Environment and Climate Action 2024



This work is licensed under a Creative Commons Attribution 4.0 International licence. You are free to re-use the work under that licence, on the condition that you credit the State of Victoria as author. The licence does not apply to any images, photographs or branding, including the Victorian Coat of Arms, the Victorian Government logo and the

Department of Energy, Environment and Climate Action (DEECA) logo. To view a copy of this licence, visit

Disclaimer

This publication may be of assistance to you but the State of Victoria and its employees do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.

Accessibility

If you would like to receive this publication in an alternative format, please telephone the DEECA Customer Service Centre on 136186, email customer.service@delwp.vic.gov.au or via the National Relay Service on 133 677 www.relayservice.com.au. This document is also available on the internet at www.recycling.vic.gov.au.

Contents

1. Scope of the Waste to Energy Scheme.....	2
2. Technology / process	6
2.1 Thermal waste to energy processes.....	6
2.2 Processes that are not thermal waste to energy processes.....	6
3. Waste categories under the Scheme	14
3.1 Permitted waste	16
3.2 Exempt waste.....	20
3.3 Banned waste.....	22

1. Scope of the Waste to Energy Scheme

Purpose

This document provides guidance on whether a proposed waste to energy facility is in or out of scope of the Waste to Energy Scheme (the Scheme) under the *Circular Economy (Waste Reduction and Recycling) Act 2021* (CE Act) and associated regulations. The document also provides guidance on the consequence of being within scope of the Scheme, including whether a facility requires a waste to energy (existing operator¹ or cap) licence to operate.

Scope overview

The Scheme is designed to regulate only certain types of thermal waste to energy facilities in Victoria. Whether a facility falls within the scope of the Scheme is determined by a combination of the following:

- The type of technology/process it will use.
- The type of waste it will process.
- The outputs from the process.

Each of these elements are set out in the:

- CE Act
- Circular Economy (Waste Reduction and Recycling) (Waste to Energy Scheme) Regulations 2023 (the Regulations).

What it means to be in or out of scope of the Scheme

Thermal waste to energy processes under the CE Act are in scope of the Scheme. If the process is a thermal waste to energy process, the definitions of permitted, exempt and banned waste must be considered. (See [section 3 Waste categories under the Scheme](#).)

Depending on the type of waste processed, a waste to energy licence may or may not be required for the facility to operate.

- **Permitted waste:** Under section 74O of the CE Act, a person operating a thermal waste to energy facility must **not** process permitted waste at the facility using a thermal waste to energy process **except** as authorised by a waste to energy licence. Civil penalties apply to anyone who processes permitted waste without a waste to energy licence.
- **Exempt waste:** Facilities processing *only* exempt waste, as prescribed in regulation 6 of the Regulations, do not require a waste to energy licence to operate.
- **Exempt and permitted waste:** Facilities that process both exempt and permitted waste require a waste to energy licence to operate. The licence is for the portion of permitted waste only.

¹ Existing operators are those who had approval for permitted waste to be processed using a thermal waste to energy process under the *Environment Protection Act 2017* or *Planning and Environment Act 1987* before 1 November 2021. Applications for existing operator licences closed 4 December 2023.

- **Banned waste:** Processing banned waste using a thermal waste to energy process is an offence under section 74Q of the CE Act. The operator of a thermal waste to energy facility must **not** process banned waste at the facility using a thermal waste to energy process.

Processes that are not thermal waste to energy processes under the CE Act are out of scope of the Scheme. This means that operators using processes that are not thermal waste to energy processes, as defined under the CE Act or Regulations, do not require a waste to energy licence to operate.

Table 1 provides a high-level overview of the scope of the Scheme by showing how each of the 3 elements – technology/process, waste and output – interact with each other to determine whether a facility is in or out of scope of the Scheme and whether a waste to energy licence is required to operate the facility.

Table 1: Scope overview

Technology / Process	Waste / Input	Output	In or out of scope of the Scheme	Waste to Energy licence required?
Thermal waste to energy processes as defined in section 74M(1) of the CE Act				
A thermal process such as gasification, pyrolysis, or incineration (including a thermal process such as gasification or pyrolysis to change the chemical structure of a material or substance)	Permitted waste only	Heat (converted to steam or electricity) / fuel	In scope	Yes
	Exempt waste only	Heat (converted to steam or electricity) / fuel	In scope	No
	Permitted <u>and</u> exempt waste	Heat (converted to steam or electricity) / fuel	In scope	Yes (with a cap allocation for the portion of permitted waste only)
	Banned waste only	Heat (converted to steam or electricity) / fuel	In scope	Banned – must not operate (s 74Q)
Non-thermal waste to energy processes as defined in section 74M(2) of the CE Act or regulation 5 or 7 of the Regulations				
A process that treats waste biomass through a pyrolysis process or gasification process to sequester carbon	Waste biomass (as defined in regulation 4 of the Regulations)	Sequestered carbon (e.g. biochar that is applied to land)	Out of scope – regulation 7(b) of the Regulations	No
Advanced recycling process (changing the chemical structure of a material or substance)	A material or substance	<u>Monomer</u> or chemicals <u>intended</u> for production	Out of scope – section 74M(2)(a) of the CE Act, as	No

Technology / Process	Waste / Input	Output	In or out of scope of the Scheme	Waste to Energy licence required?
through cracking, gasification, pyrolysis or depolymerisation)		of polymer materials (other than fuels)	further defined in regulation 5 of the Regulations	
Biological waste to energy process meaning a process that uses microbial action to recover energy from waste For example: anaerobic digestion and fermentation.	All types of waste	Any energy, e.g. biogas or fuel products	Out of scope – section 74M(2)(b) of the CE Act	No
Landfill gas collection and combustion	Landfill gas	-Methane flaring or energy	Out of scope – section 74M(2)(c) of the CE Act	No
Incineration of waste without energy recovery	All types of waste	(No energy recovery)	Out of scope – section 74M(2)(d) of the CE Act	No
A process that recovers energy from a material other than waste	Material other than waste (e.g. coal)	Energy	Out of scope - section 74M(2)(e) of the CE Act	No
A thermal waste to energy process in respect of which a pilot project licence has been issued under the <i>Environment Protection Act 2017</i> and is in force	-	-	Out of scope – regulation 7(a) of the Regulations	No

There are definitions in the CE Act and Regulations for some of the terms used in Table 1. These terms are explained in more detail at Sections 2 and 3.

As shown in Table 1, being in scope of the Scheme does not automatically mean that a facility will need a waste to energy licence under the CE Act to operate.

Outputs

Section 74M(1) of the CE Act describes what the outputs of a waste to energy process must be for it to be defined as a thermal waste to energy process and therefore within scope of the Scheme.

The outputs of a thermal waste to energy process are:

- energy recovered from waste in the form of heat (which may be converted to steam or electricity)
- fuel produced from waste.

If neither of these are the outputs from a thermal process, then the process is out of scope of the Scheme — it is not a thermal waste to energy process under the CE Act.

The outputs from certain processes may be relevant to determining whether they are out of scope of the Scheme. See [Section 2.2 Processes that are not thermal waste to energy processes](#) for more information.

What if it is unclear whether I am in or out of scope of the Scheme?

Recycling Victoria can determine whether a facility is in or out of scope of the Scheme. Recycling Victoria may require further evidence or documentation to confirm whether your facility is in or outside the scope of the Scheme, as required under the CE Act and/or Regulations.

Recycling Victoria can be contacted at: wastetoenergy.licence@deeca.vic.gov.au

Where a process is outside the scope of the Scheme, other co-regulatory approvals may still be required, such as an Environment Protection Authority Victoria (EPA) development licence or planning permit for the construction and operation of a waste processing facility.

2. Technology / process

The type of technology/process that a facility adopts, together with the waste it processes and the outputs from the process, will determine whether a facility is in or out of scope of the Scheme, and whether a waste to energy licence is required.

Waste to energy processes are categorised as:

- thermal waste to energy processes – these are in scope of the Scheme
- processes that are not a thermal waste to energy process as defined under the CE Act – these are out of scope of the Scheme.

2.1 Thermal waste to energy processes

Thermal waste to energy is defined in section 74M(1) of the CE Act as:

- a thermal process used to recover energy from waste in the form of heat (which may be converted to steam or electricity), or
- a thermal process used to produce fuel from waste, or
- a thermal waste to energy process prescribed by the Regulations.

Note there are currently no thermal waste to energy processes prescribed by the Regulations.

Examples of technology that can be used in a thermal waste to energy process include:

- **Gasification** – technology where waste materials are heated to very high temperatures (generally between 1000 to 1500 degrees Celsius) with some oxygen or steam that breaks down the molecules into a syngas. See definition of ‘gasification process’ in regulation 4 of the Regulations.
- **Pyrolysis** – the treatment of waste with heat (generally between 400 and 1000 degrees Celsius) in the absence of oxygen, with or without catalysts. See definition of ‘pyrolysis process’ in regulation 4 of the Regulations.
- **Incineration or combustion** – a process of thermal oxidation of waste or otherwise burning waste at high temperature (typically between 800 and 1200 degrees Celsius) in the presence of oxygen to reduce the volume of waste and to generate heat, steam and electricity.

Note that no definition is provided for ‘incineration’ or ‘combustion’ in the CE Act or Regulations and this definition is based on a generally accepted industry definition of the technology.

2.2 Processes that are not thermal waste to energy processes

Processes that are not thermal waste to energy processes are listed in section 74M(2) of the CE Act and regulations 5 and 7 of the Regulations. These include:

- an advanced recycling process as defined in regulation 7 of the Regulations (see [sub-section 2.2.1 below on advanced recycling processes](#) for details and how it differs from waste to liquid fuel processes)
- a biological waste to energy process, which is defined in section 74L of the CE Act as ‘a process that uses microbial action to recover energy from waste’. This would include anaerobic digestion.
- landfill gas collection and combustion

- the incineration of waste without energy recovery
- a process that recovers energy from a material other than waste
- a thermal waste to energy process in respect of which a pilot project licence has been issued under the *Environment Protection Act 2017* and is in force
- a process that treats waste biomass through a pyrolysis process or gasification process to sequester carbon, for example, a process that produces biochar that is applied to land (see [sub-section 2.2.2 below on treating waste biomass through pyrolysis or gasification to sequester carbon](#) for details).

2.2.1 Advanced recycling processes

A thermal waste to energy process does **not** include an advanced recycling process under section 74M(2)(a) of the CE Act. An advanced recycling process is further defined in regulation 5 of the Regulations as:

...the conversion of a material or substance to monomer or chemicals intended for the production of polymer materials (other than fuels) by changing the chemical structure of a material or substance through cracking, gasification, pyrolysis or depolymerisation.

Example

A facility processing post-consumer soft plastics back into industrial-quality soft plastics.

Advanced recycling is also known as chemical, molecular or feedstock recycling. Recycling Victoria considers that advanced recycling should operate in a manner complementary to mechanical recycling. These technologies achieve higher order circular economy outcomes than waste to energy and accordingly are **not** subject to the cap in the Scheme.

CSIRO has published the 'Advanced recycling technologies to address Australia's plastic waste' report dated August 2021 that details the different kinds of advanced recycling processes available worldwide.²

Regulation 5 of the Regulations is flexible and adaptable to new or emerging technologies, such as those referred to in the CSIRO report. Where it is unclear whether a proposed recycling activity falls within scope of this provision Recycling Victoria may provide further advice. Recycling Victoria can be contacted at: wastetoenergy.licence@deca.vic.gov.au.

What advanced recycling technologies are within the scope of regulation 5 of the Regulations?

Where a process uses a combination of one or more of the technologies below, this may fall within the definition of an 'advanced recycling process' set out in regulation 5 of the Regulations provided that the primary, genuine and ongoing intention of the proponent is to produce chemicals intended for the manufacture of polymer materials. This is discussed further below.

The following technologies may be considered an advanced recycling process:

- Purification of plastics by using solvents to dissolve plastic materials (including through addition of heat in the process) to extract or remove additives and to extract any undissolved impurities, where the primary output is polymeric material, not heat and/or fuel. This is followed by removal of the solvent to leave a final pure output polymer pellet. Despite the addition of heat in the process, these activities will fall within the scope of regulation 5 of the Regulations and are **not** a thermal waste to energy process. Further, where these processes do not recover energy or fuel, they will **not** be a

² Advanced recycling technologies to address Australia's plastic waste, CSIRO August 2021 <https://www.csiro.au/en/news/all/news/2021/august/advanced-recycling-turning-plastic-waste-into-resources>

thermal waste to energy process under section 74M of the CE Act and are out of scope of the Scheme.

- Depolymerisation – breaking down of certain types of well-sorted plastic wastes to constituent monomers or small groups of monomers using chemical (chemolysis/solvolysis), thermal (thermolysis) or biological (enzymolysis) processes. Although some of these processes may include the application of heat and oxygen, they are likely to fall within the definition of an advanced recycling process where the primary output is polymeric material, not heat and/or fuel. If there is no recovery of heat or energy from the processes, they will **not** be a thermal waste to energy process.
- Pyrolysis – the treatment of waste with heat (generally between 400 and 1000 degrees Celsius) in the absence of oxygen, with or without catalysts. This will generate a few products, typically char, syngas, wax and oils (which may be referred to by a few different names, including pyrolysis oil, circular naphtha or bio-crude, etc). Whether a pyrolysis process will fall within the definition of an advanced recycling process is explored in detail below.
- Gasification – where waste materials are heated to very high temperatures (generally between 1000 and 1500 degrees Celsius) with some oxygen or steam that breaks down the molecules into a syngas. Gasification of waste plastics will produce syngas, waste tar and ash. The syngas could be separated and scrubbed, cooled and condensed, and then may be purified and used as a feedstock to produce certain polymer materials. Where gasification technology is intended to be used to convert waste plastics back into polymer materials and not for the combustion of syngas to generate heat and electricity (which will require a licence under the CE Act), it may fall within definition of an advanced recycling process.

Note that mechanical recycling processes (whether conventional or utilising innovative or novel processes) will also be outside of scope of the Scheme where these processes do not recover energy from waste.

Are two stage chemical recycling processes captured by regulation 5 of the Regulations?

Recycling Victoria notes that advanced chemical recycling using pyrolysis or gasification is likely to be undertaken in two distinct stages:

1. Conversion of mixed plastics (typically first requiring pre-sorting and pre-treatment) or other feedstocks (such as tyres) into a raw 'pyrolysis oil' using a purpose-built pyrolysis plant
2. Using refinery and cracking technology to process the pyrolysis oil into fractions, some of which are suitable to produce new plastic products (such as ethylene).

Recycling Victoria considers that this two-stage process will fall within the definition of an advanced recycling process so long as the persons or entities undertaking the processes can demonstrate a chain of custody (such as through a Mass Balance Attribution System (MBAS)) showing that input waste plastic material can be attributed to specific polymer product output.

The requirement to demonstrate an 'intention' to convert waste product into polymers

As noted above, the definition of 'advanced recycling process' in regulation 5 of the Regulations refers to the 'conversion of a material or substance to monomer or chemicals intended for the production of polymer materials (other than fuels)'. Recycling Victoria considers the word 'intended' in this context to mean a primary intention to use the chemicals (pyrolysis oil) to produce polymer materials, as opposed to a primary intention to use those chemicals to produce fuels. This intention must be genuinely held and continue throughout the life of the advanced recycling process for the facility to remain out of scope of the Scheme.

Provided that an operator can demonstrate a primary, genuine and ongoing intention to produce polymer materials from the mixed plastic inputs and pyrolysis oil, they will not be required to hold a waste to energy licence under the CE Act. This extends to advanced recycling processes that use a small proportion of the output to generate energy to fuel the process.

How to demonstrate an intention to convert waste product into polymers?

Anyone proposing to undertake an advanced chemical recycling process in Victoria should contact the Waste to Energy Team at Recycling Victoria as soon as practicable to discuss the proposed process and to ensure consistency with this guidance. The Waste to Energy Team can be contacted at wastetoenergy.licence@deeca.vic.gov.au.

Some possible ways to demonstrate the requisite intention noted above are:

- Statutory declarations from senior representatives of the companies involved at key stages of the process as to the intention to produce polymer materials in undertaking the relevant process.
- Appropriate use of a MBAS* (including a free attribution method) in accordance with an internationally accredited system – including any required independent auditing and self-reporting or declarations.
- Appropriately worded contractual conditions between the pyrolysis oil producer and any other party undertaking processing of that oil, agreeing to comply with any MBAS auditing requirements and detailing expectations that the pyrolysis oil processor will maximise production of chemicals suitable to produce polymer materials.
- Demonstrated use of processes and technologies that maximise plastics recovery.

*A Mass Balance Attribution System (MBAS) is a method of tracking the flow of materials through a value chain from the input material to the output product. In relation to advanced recycling processes, an appropriately accredited MBAS will enable industry participants to account for where inputs end up and make appropriate claims (such as in advertising) as to the ultimate recycled polymer content in each product.

There are multiple MBAS accrediting organisations that operate globally.

Recycling Victoria is open to considering proposals from persons proposing to undertake an advanced chemical recycling process as to how the requisite 'intent' will be demonstrated initially and through the life of the chemical recycling process.

Use of overseas infrastructure to process pyrolysis oil

The CE Act does not prohibit plastics or plastic-derived products from being processed overseas.

The export of pyrolysis oil may require Australian Government approvals. Information relating to export restrictions on plastics and categories of processed products (including by-products) is available on the Department of Climate Change, Energy, the Environment and Water (**DCCEEW**) [website](#).

Recycling Victoria will scrutinise any company proposing to undertake a pyrolysis process in Victoria with an intention to then process pyrolysis oil internationally to ensure that they intend to produce recycled material for the purposes of satisfying this exclusion from the Scheme.

What about if I want to produce 'renewable or recycled' fuel oil products?

If you want to produce fuel oil from waste, you will need a waste to energy licence under the CE Act.

Appropriate use of MBAS will require you to identify a specific output product. For the purposes of regulation 5 of the Regulations, this must be polymer materials (or chemicals capable of producing polymer materials). If you intend to market any fuel products generated from the processing of pyrolysis oil as 'renewable' or 'recycled', then you are not intending to produce polymer materials and you will need a waste to energy licence.

Does the production of by-products from the pyrolysis process cause this process to fall outside of scope of regulation 5 of the Regulations?

Recycling Victoria considers that the production of by-products from a pyrolysis process will not automatically cause the use of that process to fall outside of the definition of an 'advanced recycling process' in the Regulations. What is important is how those by-products are intended to be used.

Syngas

Gasses produced by a pyrolysis process will technically be fuel products. However, provided that all syngas is used as part of the heating process required to run the pyrolysis process, Recycling Victoria considers that the process will remain within scope of regulation 5 of the Regulations. This is because the gasses are 'chemicals intended for the production of polymer materials' given their use to produce a pyrolysis oil product which is also intended to be used to produce polymer materials or other non-fuel materials such as lubricating oils.

If excess syngas is produced that the operator intends to on-sell or use for any purpose other than the production of polymer materials, this may cause the process to fall outside the scope of regulation 5 of the Regulations and require a waste to energy licence under section 74M(1)(a)(ii) of the CE Act.

Similarly, if it is proposed to further refine the syngas with an intention to produce hydrogen or other fuels for sale or other uses, this may also cause the activity to no longer be an advanced recycling process within the meaning of regulation 5 of the Regulations.

Other oil or heavy products

Recycling Victoria notes that a chemical recycling value chain may result in the production of other non-fuel materials, such as lubricating oils, wax waterproofing compounds, other waxes (to be used as additives in polymer production), industrial solvents and detergents.

So long as the primary and ongoing intention of the operator undertaking the thermal processing of the feedstock material or substance is to produce polymer materials as described above, the production of these other non-fuel materials will not cause the process to fall outside of scope of the definition of an 'advanced recycling process.'

Char

Recycling Victoria considers that the char produced by the pyrolysis process also generally does not cause the activity to fall outside the scope of regulation 5 of the Regulations. However, this may change depending on how the char product is proposed to be used, such as where the char is proposed to be used as a fuel product in steel production as a high carbon additive.

Where it can be demonstrated that the char product is produced solely from organic contaminants of mixed plastic feedstock or that it is inseparable from that plastic feedstock (such as multilayered plastic), and where that input meets the definition of 'waste biomass' in regulation 4 of the Regulations and will be converted into a product that sequesters carbon, this may also be out of scope of the Scheme under regulation 7(b) of the Regulations.

Example 1

Company A wishes to operate a pyrolysis process where they would take separated soft plastics and convert the soft plastics into a raw pyrolysis oil using a purpose-built pyrolysis plant. Company A (or another corporate entity) would then process, refine and convert the pyrolysis oil (combined with other raw crude oil products) into propylene and various other refined fuel products using refinery technology and a fluidised catalytic cracker.

The pyrolysis plant stage would produce pyrolysis oil, as well as char by-products (15-30% depending on contamination rates), and process syngas, which would be fully consumed in the pyrolysis process to generate process heat. The oils produced from the polypropylene would then be processed (or sold to a customer to be processed) into various plastic products that are intended to be marketed as either containing a 'content of recycled material' or '100% recycled'.

Company A will use MBAS to demonstrate a verifiable conversion factor for all waste plastic inputs to pyrolysis oil, propylene and final plastic products. Company A has ensured that all major parties involved in the processing of waste back into plastic materials have been audited and accredited by an internationally respected and transparent MBAS accreditation body. Company A will ensure that it receives declarations at key stages pertaining to specific batches of its products and that conversion factors have been verified. Company A has agreed to provide these materials to Recycling Victoria when asked to do so.

Company A will **not** require a thermal waste to energy licence under the CE Act as it is carrying on an advanced recycling process within the definition provided in regulation 5 of the Regulations.

Example 2

Company B runs a recycling facility that uses a depolymerisation process using thermolysis to process and convert certain kinds of well-sorted plastics (like PET) into monomers (90%), char (8%) and gas (2%). Company B wants to understand whether it falls within scope of regulation 5 of the Regulations (advanced recycling process) based on the type of products produced.

Monomers are expressly captured in the definition of an advanced recycling process. The char produced through this process is a by-product. Although gas is produced through this process, the activity may still be considered to still fall within scope of regulation 5 of the Regulations where that gas (as a fuel product) is re-used on site by Company B to help power the advanced recycling process.

If Company B can demonstrate that it continues to 'intend' to use any fuel chemicals (i.e. syngas generated during the processing of materials) to produce polymer materials (i.e. through using the gasses to generate electricity or heat that powers the pyrolysis process or other related processes in producing polymer materials), then Recycling Victoria considers that the process will be an advanced recycling process within the definition in regulation 5 of the Regulations.

As a result, the process is out of scope of the Scheme and Company B does **not** require a waste to energy (operating or cap) licence to operate. Other regulatory approvals (such as a development licence under the *Environment Protection Act 2017*) may still be required.

In future, if Company B wishes to use the gas to produce other fuel products (including hydrogen) for sale or a purpose other than the production of polymer materials, it would likely require a waste to energy (cap) licence to operate. This is because the process would no longer fall within the definition of an advanced recycling process under regulation 5 of the Regulations.

In future, Recycling Victoria may seek to audit facilities that do not hold a waste to energy licence to ensure compliance with requirements under the CE Act including appropriate reliance on the 'advanced recycling process' definition in the. Material demonstrating compliance should be retained in the event of any such audit by Recycling Victoria.

2.2.2 Treating waste biomass through pyrolysis or gasification to sequester carbon

Certain processes have been prescribed **not** to be a thermal waste to energy process under section 74M(2)(f) of the CE Act. Regulation 7(b) of the Regulations prescribes the following to not be a thermal waste to energy process:

A process that treats waste biomass through a pyrolysis process or gasification process to sequester carbon.

Example: A process that produces biochar that is applied to land.

For the purposes of this regulation, waste biomass is defined in regulation 4 of the Regulations as wastes that are:

- biological in origin
- animal or plant matter (such as food and garden waste)³
- wood waste⁴
- crop waste
- biosolids⁵.

Biochar is defined in regulation 4 of the Regulations as ‘a stable type of charcoal produced from heating organic matter in a high temperature, low oxygen combustion process such as pyrolysis or gasification.’

If all of the following elements are satisfied, the process will be outside of scope of the Scheme:

- A suitable pyrolysis or gasification process is used (such as a process that uses sufficiently high temperature and pressure as to achieve desired carbon sequestration)
- The only feedstock is waste biomass.
- The process will result in the effective sequestration of carbon in a stable form of charcoal, biochar or similar products.

When waste biomass is not the sole feedstock

If any feedstock other than waste biomass is treated, the process will **not** be within the scope of regulation 7(b) of the Regulations and you may need a waste to energy licence.

Additionally, if the type of waste biomass treated is listed under r 6(a) of the Regulations, the waste biomass would be ‘exempt waste’. This means that the thermal waste to energy facility does **not** require a waste to energy licence to operate.

Waste biomass that is not listed under regulation 6(a) of the Regulations is banned and **must not** be processed by a thermal waste to energy facility.

What if the process creates other byproducts?

The production of syngasses, which are substantially consumed in running the pyrolysis or gasification process, will not cause the activity to fall outside the scope of regulation 7(b) of the Regulations.

³ This could include municipal food organics and garden organics (FOGO) waste material and large woody plant matter – such as branches or large diameter logs.

⁴ Defined in regulation 4 of the Regulations as having the same meaning as wood waste in the Renewable Energy (Electricity) Regulations 2001 of the Commonwealth.

⁵ Defined in regulation 4 of the Regulations as solid organic residues from the wastewater treatment process and treated sewage sludge.

Similarly, the production of wood vinegar, tars, waxes or other byproducts will not cause the process to fall outside the scope of r 7(b) of the Regulations so long as a substantial proportion of the waste biomass is converted into a product that effectively sequesters carbon.

Sequestering carbon is key

The effective sequestration of carbon through this process is a key element to the process being out of scope of the Scheme.

Sequestering carbon is defined in regulation 4 of the Regulations as ‘capturing and storing atmospheric carbon dioxide (other than by storing in landfill).’

Recycling Victoria is likely to consider the requirements of regulation 7(b) of the Regulations to be met where the product created is effective in sequestering carbon. Examples of products that may be produced through treating waste biomass using a suitable pyrolysis or gasification process and which are likely to effectively sequester carbon include:

- biochar
- carbon black
- activated carbon.

Projects seeking to sequester carbon in biochar or similar products, and rely on regulation 7(b) of the Regulations, should use a method approved by the Clean Energy Regulator, the Voluntary Carbon Standard or other similar program recognised by the Australian Government that would allow them to receive carbon credits equivalent to the amount of carbon sequestered. Having a project approved by a program administrator for an active program is likely to be sufficient evidence that the process is effective in sequestering carbon and meets the requirements of this provision.⁶

Accredited carbon credit schemes include:

- Clean Energy Regulator’s method ‘*Estimating soil organic carbon sequestration using measurement and models method*’⁷ that allows for the generation of Australian Carbon Credit Units (ACCUs) from the application of biochar on land where the biochar is produced from biosolids, municipal solid waste and other organic wastes; or
- Verified Carbon Standard ‘*Methodology for biochar utilisation in soil and non-soil applications*’⁸ that allows for the generation of Verified Carbon Units (VCUs) and contains the procedures required to calculate the carbon sequestration benefits of biochar production and utilisation using waste biomass.

What if I want to process waste biomass to generate energy?

Only a very limited category of waste biomass has been prescribed in the Regulations to be ‘exempt waste’ under section 74L of the CE Act and regulation 6(a) of the Regulations. This limited category of waste biomass can be processed using a thermal waste to energy process without a waste to energy licence issued under the CE Act. Any other category of waste biomass is prescribed to **not** be permitted waste under regulation 8(1) of the Regulations. That means it is banned waste and must **not** be processed using a thermal waste to energy process. See [Section 3.3 Banned waste](#).

Below are some examples that would be considered as treating waste biomass through pyrolysis or gasification to sequester carbon.

⁶ Note that, projects or processes that may receive carbon credits due to avoiding landfill emissions, or for any other reason, but that do not sequester carbon, will not be eligible to rely on this exemption.

⁷ Australian Government. Clean Energy Regulator. <https://cer.gov.au/schemes/australian-carbon-credit-unit-scheme/accu-scheme-methods/estimating-soil-organic-carbon-sequestration-using-measurement-and-models-method>

⁸ Verified Carbon Standard. <https://verra.org/methodologies/vm0044-methodology-for-biochar-utilization-in-soil-and-non-soil-applications/>

Example 1

Company C is proposing to use garden and woody waste from households (which is collected from a municipal food organics and garden organics (FOGO) kerbside service) through a pyrolysis process to generate biochar and apply the biochar to land and sequester carbon. The Clean Energy Regulator has approved the project. The project has generated or, once operational, will generate, Australian carbon credit units for the carbon sequestered. Company C would be out of scope of the Scheme.

This is because Company C would be treating waste biomass through a pyrolysis process to sequester carbon in biochar applied to land. Under regulation 7(b) of the Regulations, this is a process that is **not** a thermal waste to energy process and therefore out of scope of the Scheme. As such, Company C will **not** require a waste to energy (cap) licence to operate its facility.

For a further example of how regulation 6(a) of the Regulations applies, please see 'Wood Waste' below.

3. Waste categories under the Scheme

Waste type determines whether a licence is required

If a facility proposes to use a thermal waste to energy process as defined in section 74M of the CE Act (see [section 2. Technology/process](#)) and it intends to process permitted waste, or exempt waste and permitted waste, the operator must have a waste to energy licence to operate.

Waste types under the Scheme are categorised as permitted, exempt or banned waste. These are defined under sections 74L and 74N of the CE Act and regulations 6 and 8 of the Regulations. These waste categories are also summarised in Figure 1.

Under the Scheme, thermal waste to energy facilities are only allowed to process permitted and exempt waste. Facilities processing:

- permitted waste only require a waste to energy licence
- exempt waste only do **not** require a waste to energy licence
- permitted and exempt waste require a waste to energy licence (for the portion of permitted waste only)
- banned waste **must not operate**.

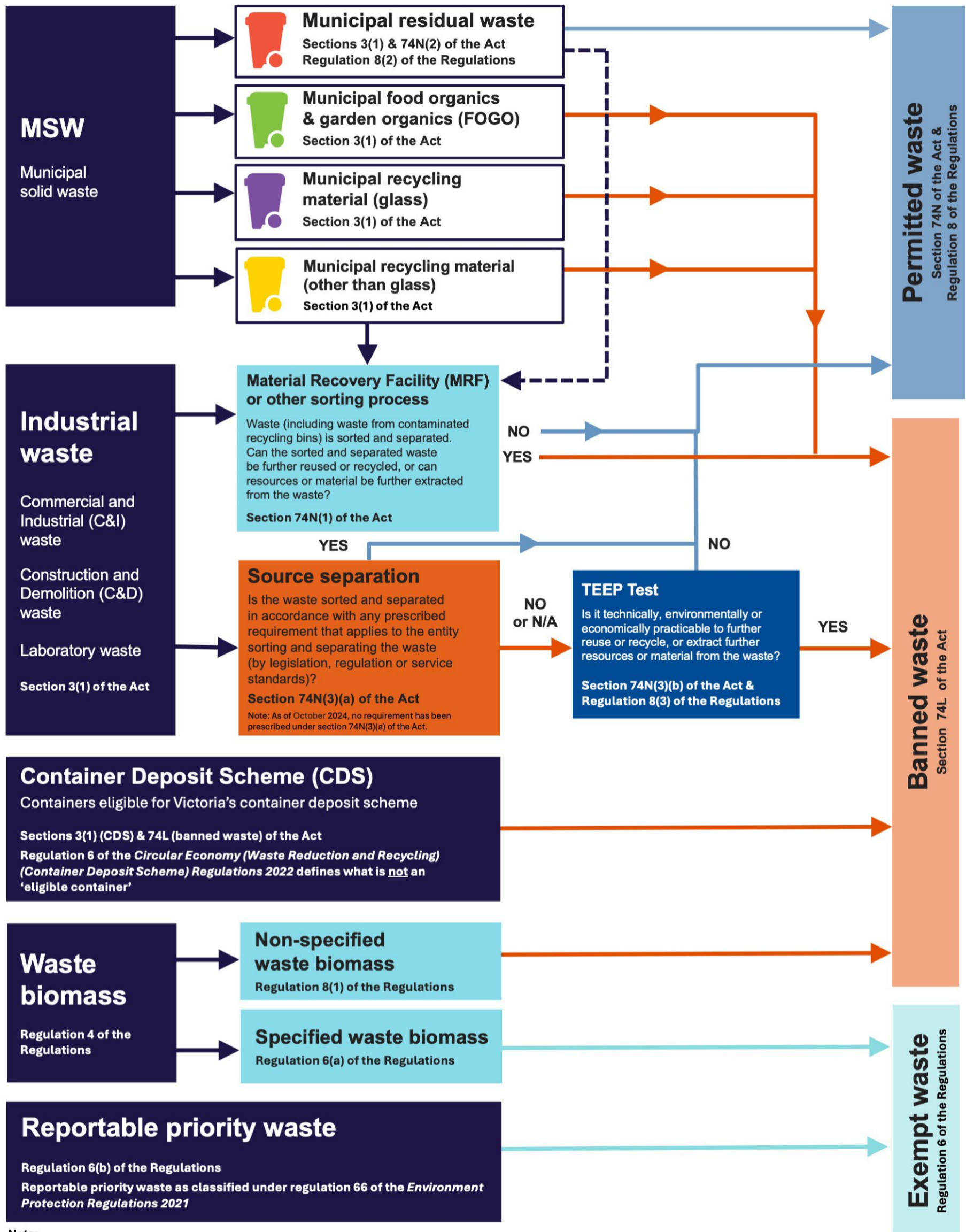
The total amount of permitted waste that can be processed under the Scheme per year will be the amount issued under waste to energy existing operator licences plus the cap limit allocated under waste to energy cap licences. Exempt waste is **not** part of the cap.

Local waste versus waste from other jurisdictions

The Scheme does **not** prohibit facilities in Victoria from processing waste from interstate or overseas.

The Scheme regulates the type and amount of permitted waste processed by thermal waste to energy facilities in Victoria, not the source of the waste. Any permitted waste processed from interstate or overseas is included in the cap. However, the Victorian Government does encourage localised waste and resource recovery solutions that limit the inter-jurisdictional transport of large amounts of waste.

Figure 1: Permitted, banned and exempt waste under the Scheme



Note:

The Act refers to the *Circular Economy (Waste Reduction and Recycling) Act 2021* unless another Act is referenced.

Regulation refers to the *Circular Economy (Waste Reduction and Recycling) (Waste to Energy Scheme) Regulations 2023* unless another regulation is referenced.

--- Dotted line denotes a possible pathway but is not required under the Act.

3.1 Permitted waste

Permitted waste is defined under section 74N of the CE Act and regulation 8 of the Regulations.

Permitted waste is:

- waste that cannot reasonably be the subject of any further recycling
- waste prescribed to be permitted waste (but does **not** include exempt waste or any waste prescribed not be permitted waste) under the Regulations.

Permitted waste can be processed at a thermal waste to energy facility under a licence up to the amount specified on that licence.

Permitted waste may include municipal solid waste (MSW) and industrial waste, provided that the relevant sorting requirements specified in the CE Act and Regulations have been met.

Licence requirement

Under section 74O of the CE Act, a person operating a thermal waste to energy facility must **not** process permitted waste at the facility using a thermal waste to energy process except as authorised by a waste to energy licence. A civil penalty applies to those who process permitted waste without a waste to energy licence.

Municipal solid/residual waste

For MSW to be permitted waste under the Scheme, it must be 'municipal residual waste' as defined under section 74N(2) of the CE Act and regulation 8(2) of the Regulations.

Municipal residual waste collected by or on behalf of a council

Municipal residual waste (other than municipal food organics and garden organics (FOGO) and municipal recycling materials) that has undergone source separation (i.e. household-level source separation) is prescribed to be permitted waste. This is achieved if councils and Alpine Resorts Victoria are providing services where the MSW is proposed to be sourced from, as detailed below.

Those 'services' are determined by whether the Household Waste and Recycling Service Standard 2024 (the **Service Standard**) has come into effect.

Before the Service Standard comes into effect, municipal residual waste is permitted waste under the Scheme if the council or Alpine Resorts Victoria provides separate collection services for:

- municipal residual waste (general rubbish)
- mixed recycling
- FOGO.

After the Service Standard comes into effect, municipal residual waste is permitted waste under the Scheme if the council or Alpine Resorts Victoria provides separate collection services for:

- municipal residual waste (general rubbish)
- mixed recycling (except glass)
- glass recycling
- FOGO.

Mixed recycling and glass that is further sorted and separated, for example at a material recovery facility (MRF) is also permitted waste if the waste cannot be further reused or recycled, or resources or materials cannot be further extracted from it.

Municipal residual waste collected by private companies

Waste from multi-unit developments (MUDs) such as apartment blocks may be collected by private companies contracted by a body corporate instead of a local council or council contractors. Under regulation 8(2) of the Regulations, municipal residual waste from MUDs is permitted waste if it has undergone source separation (separated and sorted at the household level). In order to satisfy regulation 8(2), waste to energy operators should only accept residual waste from MUDs where there are collection systems available to separately collect recyclable material.

Industrial waste and the TEEP test

Under section 74N(3) of the CE Act, industrial waste is permitted waste if:

- (a) the industrial waste is sorted and separated in accordance with any prescribed requirement that applies to the entity sorting and separating the waste; or
- (b) if no prescribed requirement described in (a) applies, the operator of a waste to energy facility shows, in accordance with the Regulations, that it is **not** technically, environmentally or economically practicable (TEEP) to further reuse or recycle, or to extract further resources or material, from the waste (i.e. it satisfies the TEEP test); or
- (c) the waste is prescribed to be permitted waste under the Regulations.

To date, no requirement has been prescribed under section 74N(3)(a) of the CE Act and no industrial waste has been prescribed to be permitted waste for the purposes of section 74N(3)(c).

Section 3 of the CE Act defines 'industrial waste' to mean:

- (a) waste arising from commercial, industrial or trade activities or from laboratories; or
- (b) waste prescribed to be industrial waste.

To date, no waste has been prescribed to be industrial waste in the Regulations.

This definition of 'industrial waste' will include:

- commercial and industrial (C&I) waste
- construction and demolition (C&D) waste.

What is the TEEP test?

Industrial waste can be permitted waste in certain circumstances. If a waste to energy operator wants to process industrial waste at their facility, they must demonstrate that the waste satisfies the TEEP test. The TEEP test is set out in section 74N(3)(b) of the CE Act and is described in further detail in regulation 8(3) of the Regulations as follows:

*For the purposes of section 74N(3)(b) of the Act, the operator of a thermal waste to energy facility must show that it is **not** technically, environmentally or economically practicable to further reuse or recycle, or to extract further resources or material, from the industrial waste by:*

- (a) *demonstrating that a technology or process does not exist that could sort or recycle the waste; or*

- (b) *demonstrating that the reuse or recycling of the waste is prohibited by [the CE Act] or any other Act; or*
- (c) *performing an assessment that compares the environmental impacts of reusing or recycling the industrial waste with the environmental costs of recovering thermal energy from that waste; or*
- (d) *performing an economic analysis that demonstrates that the financial costs of available options to reuse or recycle the waste (including transportation costs) are disproportionate to the environmental, social and economic benefits of reusing or recycling the waste.*

The TEEP test is dynamic in nature; processes of sorting and separation that are uneconomic or not technically possible today may become viable in future. Licence holders should regularly review their system-level controls (see Conditions Guidance) and emerging technologies/processes to ensure they continue to comply with the TEEP test and only process permitted industrial waste.

What the TEEP test applies to

The TEEP test only applies to C&I and C&D waste. The TEEP test does **not** apply to industrial waste that is prescribed as exempt waste in regulation 6 of the Regulations (see section [3.2 Exempt waste](#) for details). This means that if industrial waste also falls within the definition of 'exempt waste' in regulation 6 of the Regulations (that it is wood waste from an industrial site or agricultural waste), the operator will not be required to demonstrate that the TEEP test has been applied in relation to that 'exempt waste.'

Industrial waste collected by or on behalf of a council

Some small businesses may have their waste collected by or on behalf of a council (such as local shops and milk bars). Some of this waste may be aggregated with other municipal solid waste however this waste is classified as 'industrial waste' under the CE Act. If a thermal waste to energy operator wanted to use this waste at their facility, the operator must demonstrate that the waste satisfies the TEEP test for the waste to be prescribed as permitted waste.

If these commercial and industrial waste customers had access to source separation, such as separate bins and collection services for general rubbish, mixed recycling and FOGO, Recycling Victoria considers that this will satisfy the TEEP test.

Applying the TEEP test

To satisfy the TEEP test, waste to energy licence applicants and waste to energy licence holders must demonstrate that it is **not** practicable to further reuse or recycle or extract further resources or material from the industrial waste for **at least one** of the 4 reasons specified in regulation 8(3) of the Regulations.

If **none** of the reasons are met, it means that it is practicable to recycle the materials and that the licence holder/applicant does **not** satisfy the TEEP test. This means that the industrial waste must not be processed at the waste to energy facility and should be recycled instead.

What does 'practicable' mean?

Application of the TEEP test also include an assessment of whether it is technically, environmentally or economically practicable to **sort and separate** the material into a form that can be recycled, and by extension whether it is practicable for the thermal waste to energy operator to undertake or incentivise (such as through contracts with feedstock providers) improvement of the separation of that material before it reaches the facility.

Satisfying the TEEP test

Applicants for a thermal waste to energy licence will need to demonstrate how they will satisfy the TEEP test in their application for a licence, for the types and volumes of waste proposed to be received. If an applicant becomes a licence holder, they must also be able to continually demonstrate that they satisfy the TEEP test as required under the CE Act and through the provision of material required under licence condition. This is because the TEEP test is an **ongoing** obligation. Recycling Victoria will require licence holders to periodically provide evidence of TEEP test compliance as part of our ongoing monitoring and compliance activities.

Industrial waste that does not satisfy at least one element of the TEEP test is banned waste under the CE Act and cannot be processed. It is an offence under section 74Q of the CE Act to process banned waste.

TEEP test checks

To demonstrate whether an applicant or licence holder satisfies the TEEP test, Recycling Victoria will require the applicant/licence holder to provide proof of their system-level controls and any routine checks that they undertake (or propose to undertake once the facility is operational) to ensure compliance with the TEEP test. The TEEP test checks should work through each of the four reasons in regulation 8(3) of the Regulations, and describe the steps used for determining any claims or conclusions made regarding the TEEP test.

It is proposed that the licence conditions on cap licences will require the development and maintenance of a document which details 'system-level controls' at the facility to ensure that industrial waste meets the TEEP test under regulation 8(3) of the Regulations, and to ensure that no banned waste is processed.

System-level controls are the policies and procedures, such as waste acceptance protocols, and physical sorting and auditing processes a licence holder implements to ensure that only 'permitted' or 'exempt' waste is processed in accordance with sections 74O and 74Q of the CE Act.

In practice, system-level controls may include a combination of:

- source separation requirements for feedstock providers (including through use of appropriate contractual conditions)
- periodic and appropriate audits of waste being received to identify any issues in feedstock being provided – and suitable processes to provide feedback and require improvements from feedstock providers
- onsite sorting machinery or use of MRF sorting to remove any recyclable material or banned waste
- appropriate analysis to ensure compliance with elements of the TEEP test set out in regulation 8(3) of the Regulations for industrial waste.

Licence holders may change which element they use to satisfy the TEEP test over time. For example, if legislation is amended or if new technology becomes available, it may change a licence holder's ability to rely on one element of the TEEP test and they may need to satisfy another element to continue to meet the TEEP test.

Further TEEP test guidance

Recycling Victoria may release further guidance in relation to the TEEP test in future. If you have further questions in relation to the TEEP test you can contact Recycling Victoria at: wastetoenergy.licence@deeca.vic.gov.au

3.2 Exempt waste

Exempt waste is defined in section 74L of the CE Act as waste prescribed to be exempt waste. Regulation 6 of the Regulations prescribes the following to be exempt waste:

- specific types of waste biomass, and
- reportable priority waste.

Licence requirement

Exempt waste on its own can be processed at a thermal waste to energy facility without a waste to energy licence. However, if a facility processes both exempt and permitted waste, it will require a thermal waste to energy licence to operate. The cap specified for this licence will apply only to the portion of permitted waste.

Specified waste biomass

The types of waste biomass that are prescribed to be exempt waste under the Scheme are exhaustively listed in regulation 6(a) of the Regulations. Only the items included in the following list are exempt waste:

- wood waste, which has the same meaning as wood waste in the *Renewable Energy (Electricity) Regulations 2001* of the Commonwealth
- waste from any of the following primary production activities:
 - straw, chaff and other waste from agricultural crops
 - nut hulls and shells
 - pips, pits and seeds from olives and other fruits
 - grape marc and other grape processing waste
 - poultry litter
 - paunch and abattoir wastes
- waste from any of the following manufacturing activities:
 - fruit and vegetable processing waste
 - residues from pulp and paper manufacturing and processing that cannot be recycled into new paper products
- biosolids (solid organic residues from the wastewater treatment process and treated sewage sludge).

See section [3.3 Banned waste](#) for waste biomass that has **not** been specified as exempt waste under the Scheme.

Wood waste

Regulation 4 of the Regulations defines 'wood waste' as having the same meaning as regulation 8 of *Renewable Energy (Electricity) Regulations 2001* of the Commonwealth. In accordance with this regulation 'wood waste' means:

- biomass produced from non-native environmental weed species
- biomass harvested for the control or eradication of the species, from a harvesting operation that is approved under relevant Commonwealth, State or Territory planning and approval processes

- a manufactured wood product or a by-product from a manufacturing process such as:
 - packing case
 - pallet
 - recycled timber
 - engineered wood product (including one manufactured by binding wood strands, wood particles, wood fibres or wood veneers with adhesives to form a composite)
- waste products from the construction of buildings or furniture, including timber off-cuts and timber from demolished buildings
- sawmill residue.

How is biomass from municipal FOGO (green lidded bins) treated?

The definition of wood waste does **not** include woody products or material from municipal FOGO (such as branches, offcuts, household organic matter or leaf litter). This means that wood waste as a form of waste biomass referred to in regulation 6 of the Regulations (exempt waste) does **not** include municipal FOGO material.

Municipal FOGO is **not exempt waste** under the Scheme. It is **banned** waste and cannot be processed at a thermal waste to energy facility (see [section 3.3 Banned waste](#)). Municipal FOGO can still however be processed using a non-thermal waste to energy process (without a licence under the CE Act), such as anaerobic digestion or composting.

How are briquettes, refuse derived fuel or pellets created from waste material treated?

Processes that use products created from waste and used to generate heat or energy do not require a cap licence. This includes the use of manufactured pellet/briquette products and refuse derived fuel (RDF) where it can be demonstrated that the products or RDF is no longer a 'waste'.

A person proposing to use manufactured RDF, pellets and briquettes (or any other product intended to be used as a fuel) can seek further guidance from the Waste to Energy Team at Recycling Victoria.

Recycling Victoria can be contacted at: wastetoenergy.licence@deeca.vic.gov.au

Reportable priority waste

Reportable priority waste is prescribed to be exempt waste under the Scheme in regulation 6(b) of the Regulations.

Certain 'priority waste' is classified as 'reportable priority waste' under regulation 66 of the *Environment Protection Regulations 2021*. Examples include:

- clinical and pharmaceutical wastes (including biomedical wastes)
- paints, lacquers, varnish, resins, inks, dyes, pigments and adhesives
- pesticides including herbicides and insecticides
- asbestos
- tyres.

See regulation 66 of the *Environment Protection Regulations 2021* for details.

Is municipal residual waste permitted or exempt waste if it is contaminated with reportable priority waste?

Municipal residual waste contaminated with reportable priority waste is still municipal residual waste under the CE Act and therefore permitted waste if it otherwise meets the definition of permitted waste in section 74N of the CE Act.

Example: Clinical waste is classified as reportable priority waste under the *Environment Protection Act 2017*. Any reportable priority waste must be disposed of in accordance with any applicable requirement under the *Environment Protection Act 2017*. If, however, clinical waste was found in a general rubbish bin (municipal residual waste) or in a truck that had collected general rubbish bins from a local government area, the contents of the general rubbish bin (and the truck) will still be considered permitted waste (not exempt waste) despite it containing an amount of 'reportable priority waste.'

Can certain hazardous waste types be processed through waste to energy?

The CE Act does not prohibit the processing of certain hard to dispose of waste, such as medical waste, biosecurity response waste, quarantine waste, confiscated waste and shredder floc.

Certain waste to energy technologies may be a suitable for safely and effectively treating and disposing of this waste.

These wastes are likely to be:

- 'exempt waste' where they meet the definition of 'reportable priority waste' under the *Environment Protection Regulations 2021*⁹
- 'permitted waste' where it is 'waste that cannot reasonably be the subject of any further recycling' (see s 74N of the CE Act).

Where the waste is 'exempt waste' it may be processed without a cap licence (if the facility solely processes 'exempt waste') or without contributing to usage of a cap allocation.

Where the waste is 'permitted waste', it may be processed under a cap licence and will contribute to usage of a cap allocation.

Any reportable priority waste or hazardous wastes must still be disposed of in accordance with any applicable requirement under the *Environment Protection Act 2017*.

3.3 Banned waste

Banned waste is defined in section 74L of the CE Act as:

- waste other than permitted waste or exempt waste, and
- eligible containers.

Table 4 lists waste that is banned under the Scheme.

⁹ Note that shredder floc is classified as 'priority waste' under Sch 5, Item 109 of the *Environment Protection Regulations 2021* and is therefore not 'exempt waste' under the *Circular Economy (Waste Reduction and Recycling) Act 2021*. It Recycling Victoria's view that shredder floc will be 'waste that cannot reasonably be the subject of further recycling' and therefore meet the definition of 'permitted waste'.

Table 4: Banned waste according to waste type

Waste type	Banned waste
Municipal solid waste	<ul style="list-style-type: none"> • Municipal FOGO (green lidded bin) without post collection sorting to remove any non-FOGO material. • Glass (purple lidded bin) without post collection sorting. • Mixed household recycling (yellow lidded bin) without post collection sorting.
Industrial waste	<ul style="list-style-type: none"> • Industrial waste that is technically, environmentally and economically practicable to reuse or recycle, or to extract further resources or materials from (the TEEP test is not satisfied). See the TEEP test section for details.
Victoria’s Container Deposit Scheme (CDS Vic)	<ul style="list-style-type: none"> • Containers eligible for CDS Vic. See regulation 6 of the <i>Circular Economy (Waste Reduction and Recycling) (Container Deposit Scheme) Regulations 2022</i> for details.
Non-specified waste biomass	<ul style="list-style-type: none"> • Waste biomass as defined in regulation 4 of the Regulations (wastes that are biological in origin, animal or plant matter, such as FOGO, wood waste*, crop waste and biosolids) and which has not been specified in regulation 6(a) of the Regulations. <p>* Wood waste has the same meaning as wood waste in the <i>Renewable Energy (Electricity) Regulations 2001</i> of the Commonwealth</p>

Banned waste intermixed with permitted waste that is processed at a facility

Processing banned waste at a thermal waste to energy facility using a thermal waste to energy process is an offence under section 74Q of the CE Act.

Processing banned waste (including containers eligible for CDS Vic) using a thermal waste to energy process will technically contravene section 74Q of the CE Act, regardless of whether the operator knows they are doing so or intend to do so.

There is no threshold for small infractions. There is not a specific number of eligible containers or amount of banned waste that the facility needs to process before the operator contravenes section 74Q of the CE Act.

Recycling Victoria will decide the appropriate regulatory action to take in response to a contravention of section 74Q of the CE Act. The Head, Recycling Victoria will base the decision on a number of factors in line with Recycling Victoria’s regulatory principles and approach, including the severity of the contravention and whether the operator has appropriate and robust systems and controls in place to ensure that the processing of banned waste is minimised or avoided.

