

Environment Protection Authority

Thermal energy from waste (EfW) activities

Position Statement

Thermal energy from waste (EfW) activities – Position Statement

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Purpose

This position statement will assist planning authorities, licensees and proponents of development understand the position of the Environment Protection Authority (EPA) and the regulatory requirements for thermal energy from waste (EfW) activities¹.

The EPA will use this position statement to assess development assessment referrals and activities of prescribed environmental significance requiring a licence under Schedule 1 of the *Environment Protection Act 1993* (EP Act) relating to thermal energy from waste (EfW) activities.

The aim of this position statement is to provide guidance to industry so that the recovery of EfW in South Australia supports the Objects of the EP Act and the Waste Management Objective of the *Environment Protection (Waste to Resources) Policy 2010*, and assists in achieving the objectives of the *South Australia's Waste Strategy 2015–2020* (Waste Strategy) now and into the future. This position statement meets the objectives by promoting the waste management hierarchy (Figure 1) to drive circulation of materials through the material resource recovery process and back into the productive economy prior to undertaking EfW activities.

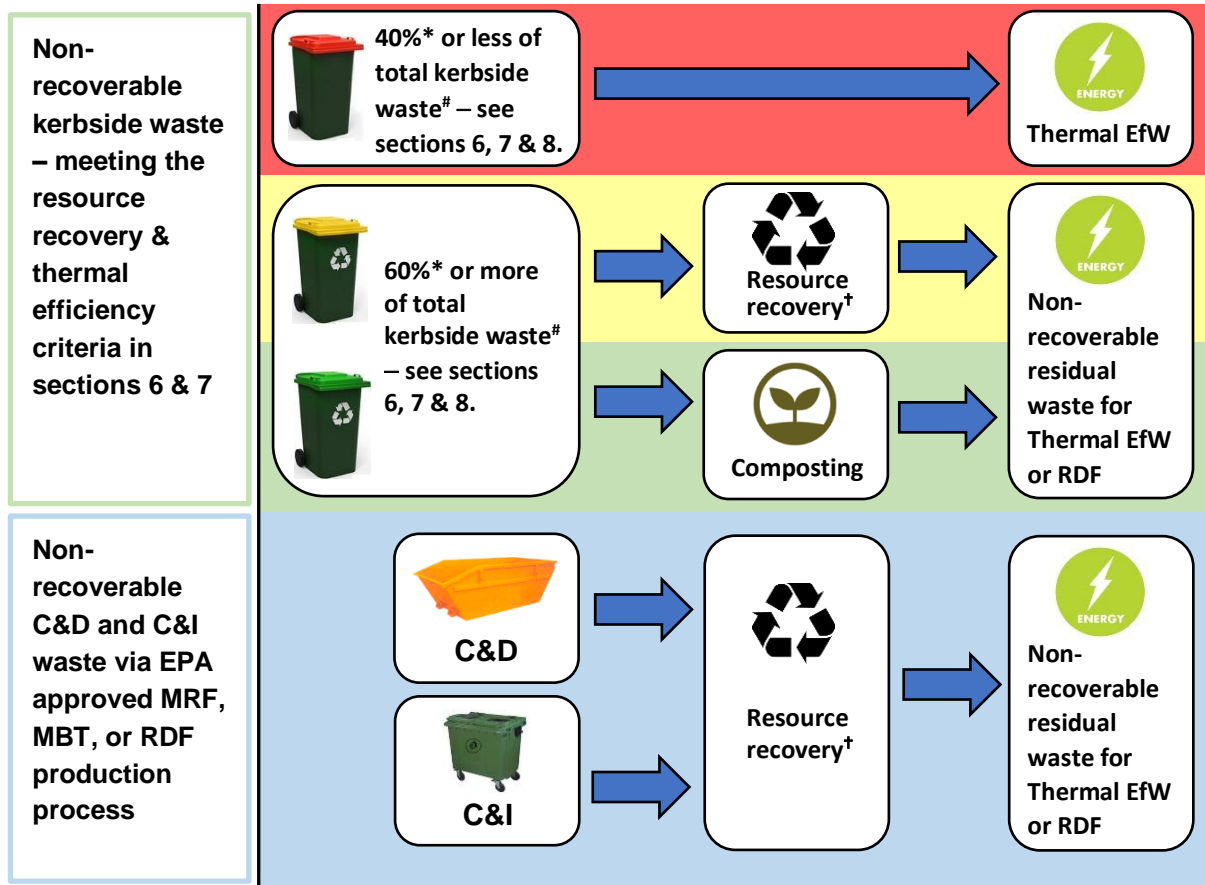
As such, enhanced material resource recovery and the circulation of materials through the economy are preferred policy outcomes ahead of energy recovery and disposal in accordance with the waste management hierarchy. The volumes of waste required by EfW activities must not undermine the Waste Strategy targets, and must also be secure to avoid an underutilised or stranded EfW asset.

In keeping with the waste management hierarchy and circular economy objectives, thermal EfW activities using waste that would otherwise be disposed to landfill are supported once sufficient material resource recovery has been undertaken. The production and use of refuse derived fuel from waste that would otherwise be disposed to landfill will be supported where it includes appropriate material resource recovery, as set out by this position statement.

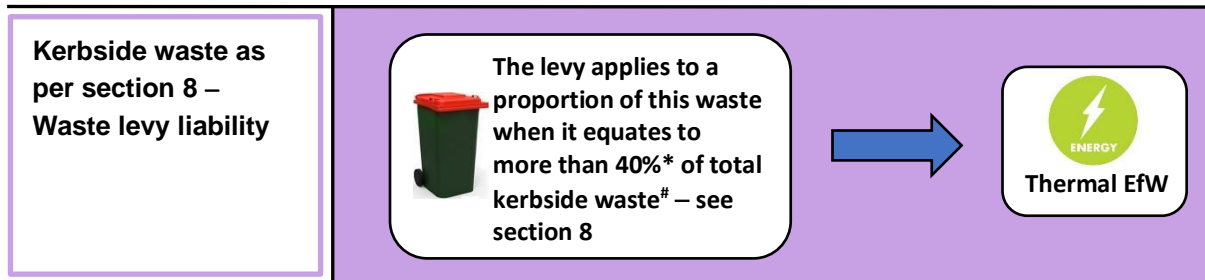
¹ This criteria will vary over time to mirror the Municipal solid waste–kerbside diversion targets as published in successive South Australian waste strategies (currently 5-year horizons).

General overview diagram

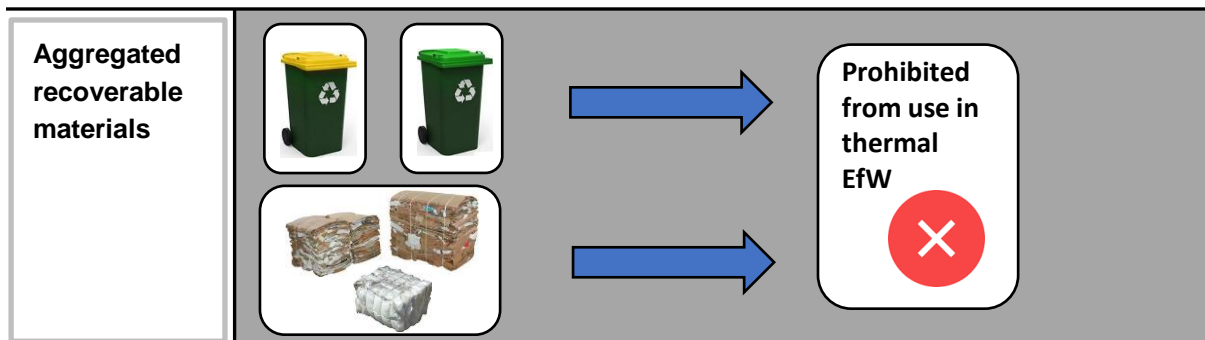
Resource recovery & thermal efficiency criteria apply (sections 6 & 7)



Waste levy applies (Section 8)



Prohibited from use in thermal EfW (Section 6, Table 1)



* This criterion will vary over time to mirror the Municipal solid waste – kerbside bin collection diversion targets as published within successive South Australian waste strategies (currently 5-year horizons).

Total kerbside waste means the sum of the three kerbside bins.

† Resource recovery means EPA-approved resource recovery process.

1 Introduction

This position statement sets out the policy context and environmental assessment criteria applying to thermal energy from waste (EfW) activities and describes how these activities are to be sited, designed and operated to meet the requirements of the *Environment Protection Act 1993* (EP Act), *Environment Protection Regulations 2009* and *Environment Protection (Waste to Resources) Policy 2010* (Waste to Resources Policy).

This position statement aligns with the objects of the EP Act and is consistent with *South Australia's Waste Strategy 2015–2020* (Waste Strategy) including the waste management hierarchy as defined by section 4B of the EP Act (Figure 1).

The Waste Strategy supports the efficient recovery of energy from residual waste and niche waste streams through best available technologies that suit local conditions, and can deliver environmental benefits and economic opportunities. The strategy iterates EfW should support and not disregard any viable options for higher order beneficial uses of waste, and have regard to impacts to businesses and supply chains that compete for the same feedstock materials.

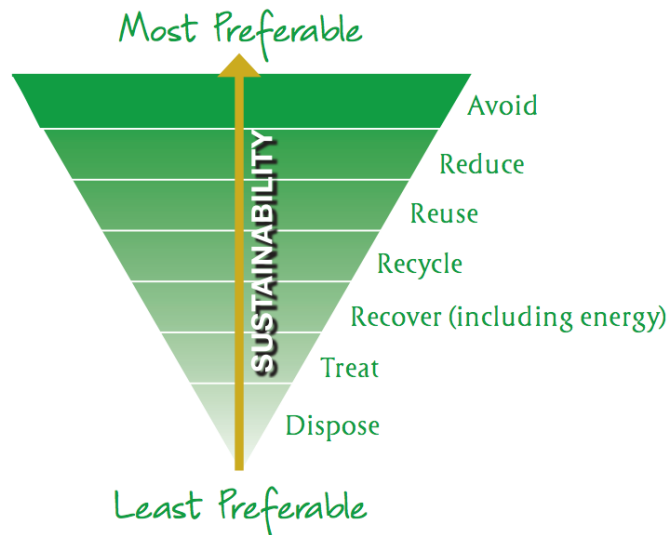


Figure 1 The waste management hierarchy

While the recovery of EfW is preferable to disposal, it is less desirable than avoidance, reuse, recycling and other material recovery activities that better contribute toward a more circular economy.

2 Scope

EfW or 'waste to energy' are terms often used to describe a range of mechanical, thermal and biological waste processing activities undertaken for the primary purpose of generating and maximising the production of a usable form of energy including heat, electricity or fuel.

This position statement addresses thermal EfW technologies including direct combustion of waste, gasification, pyrolysis, the production and use of refuse derived fuel (RDF), and the mechanical biological treatment of waste where this activity results in the production of RDF.

This position statement must be read in conjunction with the *Standard for the production and use of refuse derived fuel* (EPA 2010)².

The following activities are out of scope:

- Anaerobic digestion and other non-thermal EfW activities.
- The recovery of EfW from raw untreated biomass materials such as untreated timber and sawdust generated by sawmills, woody biomass from forestry, straw and grain husks. The use of these materials in thermal EfW activities can be assessed by the EPA under existing regulatory instruments including the *Environment Protection (Air Quality) Policy 2016* (Air Quality Policy), EP Act, and the associated pre-requisite development assessment referrals process.
- Landfill gas extraction and combustion is also excluded from this position statement as it is regulated by the EPA under conditions of environmental licence relating to landfill activities.
- The thermal treatment of contaminated soils.

² RDF Standard available at: https://www.epa.sa.gov.au/files/4771351_standard_rdf.pdf

3 Development assessment and environmental authorisation

The conduct of a thermal EfW activity that triggers one or more prescribed activities of environmental significance under Schedule 1 of the EP Act will be referred to the EPA for environmental assessment following formal lodgement of a development application with the relevant planning authority.

When assessing a development application referral involving one or more prescribed activities, the EPA has the power to request further information, direct conditions for approval by the planning authority, or direct the refusal of the application as a referral body according to the *Planning, Development and Infrastructure Act 2016*.

Following the receipt of formal development approval, the conduct of any prescribed activity of environmental significance will also require an environmental authorisation from the EPA in the form of a licence.

For specific advice on licensing or development assessment referral triggers for thermal EfW activities, contact the EPA directly on (08) 8204 2004 or 1800 623 445 (free call for non-metropolitan callers), or email epainfo@sa.gov.au.

4 Community consultation and ongoing engagement

A proposal to undertake a thermal EfW activity has the potential to generate interest and concern within the community including non-government environmental organisations or other interest groups. EfW projects requiring development approval will be subject to community consultation and/or notification as required by the *Development Act 1993*³, and the EP Act during the development assessment and licensing notification processes respectively.

Proponents of thermal EfW activities must engage in a genuine dialogue with the community ensuring the provision of accurate and reliable information about the proposal, and during the establishment and operation of the activity. Proponents of thermal EfW activities are required to develop a dedicated communication and engagement strategy or framework.

Community views, concerns and acceptance of EfW facilities may vary over time in response to changes in regional contexts. The EPA expects good neighbour and corporate citizen principles to be implemented during all stages of design, development, construction and operation of thermal EfW activities.

The community consultation approach must emphasise the building of respectful relationships with the community and encourage active participation from representatives in order to understand community perceptions and expectations, which can then be used to inform project decisions. An understanding of expectations will greatly improve the relationship between the proponent or operator and the community.

The EPA Partnership and Engagement Framework⁴ provides a model of how it supports positive working relationships with all of its stakeholders.

³ The *Development Act 1993* is being progressively repealed and will be replaced by the *Planning, Development and Infrastructure Act 2016*.

⁴ https://www.epa.sa.gov.au/about_us/communications_and_engagement_framework

5 Environmental assessment and design

5.1 Siting

The siting of an EfW activity must have regard to the [Evaluation distances for effective air quality and noise management](#) (EPA 2019). However, the EPA requires an individual assessment to be undertaken for all thermal EfW proposals. An individual assessment of potential air emissions (including odour) and noise impacts must be undertaken to the satisfaction of the EPA. The following sections detail requirements when undertaking an individual assessment.

5.2 Noise

It is a requirement for all new development and prescribed activities of environmental significance to meet the requirements of the *Environment Protection (Noise) Policy 2007*. The [Position statement: Noise and the South Australian Planning System](#) (EPA 2016) should be used by proponents to inform the siting and design of a thermal EfW activity with regard to noise at the development application stage.

Potential sources of noise associated with EfW activities include low frequency sounds from thermal processes, movement of vehicles to/from and within a site, loader buckets scraping hard surfaces, reversing alarms, and impulse noises caused by moving or dropping materials. Low frequency noise can travel across long distances, penetrate buildings and become more problematic in the quiet of night when other ambient noise is reduced.

5.3 Odour, air quality and emissions management

In determining any matters relating to licensing and development assessment, the EPA must take into account clause 18 of the *Environment Protection (Air Quality) Policy 2015* (Air Quality Policy) which sets out the following considerations:

- ground level concentrations
- odour levels
- stack emissions
- evaluation distances (individual assessment)
- localised air quality objectives, and
- any other kind of air pollution requirements to be imposed by legislation on all relevant persons.

For further details on each of these considerations see [Appendix 1](#) which states clause 18 of the Air Quality Policy.

The potential for odour to be caused by the receipt, loading, unloading, storage, sorting, treatment and processing of waste must be addressed by a thermal EfW activity proponent. The [Position statement: Air quality and the South Australian Planning System](#) (EPA 2016) provides relevant advice to proponents of thermal EfW activities.

Thermal EfW activities will, at some stage, involve the production of exhaust gases or gas combustion emissions including the release of particulates and gases from a stack or flue. The EPA uses a range of regulatory instruments for assessing development applications and monitoring required by conditions of environmental authorisations (licences) with regard to air quality. This includes assessing applications against maximum non-mandatory stack emission levels and ground level concentrations (GLCs).

In order to demonstrate compliance, potential air emissions including particulates, gases, and odour from a proposed thermal EfW activity must be assessed. The guidelines on [Ambient air quality assessment](#)⁵ (EPA 2016) must be

⁵ https://www.epa.sa.gov.au/environmental_info/air_quality/assistance_and_advice

consulted for further information on air emissions impact assessment during the siting and design stage and will assist in informing a development application.

Thermal EfW activities are required by licence conditions to undertake the following air emissions monitoring requirements (where relevant):

- Continuous monitoring of air emissions for key parameters. For example, nitrogen oxides (NO_x), carbon monoxide (CO), total particles, total organic carbon (TOC), hydrogen chloride (HCl), hydrogen fluoride (HF) and sulfur dioxide (SO₂).
- Air emissions data from continuous monitoring available to the public in real time, eg published live on the internet. This is consistent with international best practice according to the European Parliament Industrial Emissions Directive⁶.
- Continuous measurements of other relevant critical operational parameters undertaken, including temperature at a representative point in the combustion chamber, concentration of oxygen, pressure and temperature in the stack and water vapour content of the exhaust gas.
- All data obtained by these monitoring requirements are to be held by the licensee for a minimum of three years.

⁶ Directive 2010/75/EU of the European Parliament and the Council on industrial emissions (Industrial Emissions Directive or IED, <http://ec.europa.eu/environment/industry/stationary/ied/legislation.htm>)

6 Resource recovery criteria

The state government's Waste Strategy provides a landfill diversion target of 60% for Municipal solid waste (MSW) arising from kerbside bin collection, where 60% of the sum of the three bins (by weight) is diverted to resource recovery activities. This target provides the rationale for the resource recovery criteria in Table 1. This diversion target is typically reviewed at 5-year intervals.

The resource recovery criteria set out in Table 1 applies to those waste streams proposed for use in a thermal EfW activity including the production of RDF. The criteria reflect the position of energy recovery within the waste management hierarchy, including thermal EfW activities.

Section 6.1 is to be read in conjunction with Waste levy liability (section 8).

6.1 Requirement to obtain Resource Recovery Approval

A thermal EfW activity must hold a current EPA Resource Recovery Approval (RRA). In order to obtain approval, it must be demonstrated that all waste received complies with the Resource Recovery Criteria and the Thermal Efficiency Criteria (section 7) . The EPA will only issue a RRA for a thermal EfW activity where the activity is consistent with all relevant legislation, the waste management hierarchy, the waste strategy, and the waste that would otherwise be disposed to landfill.

Where the holder of a Resource Recovery Approval fails to demonstrate ongoing compliance with the resource recovery criteria, the EPA may cancel or revoke the approval or require actions by the licence-holder to validate compliance with the Resource Recovery Criteria and Thermal Efficiency Criteria.

The Resource Recovery Criteria set out by Table 1 applies prior to the use of waste in a thermal EfW activity including the production of RDF.

Table 1 Resource Recovery Criteria for waste used by thermal EfW activities including the production of RDF

Waste type	Resource Recovery Criteria
Refuse derived fuel (non-waste)	May be used in thermal EfW activities provided that it is produced in accordance with the RDF Standard and the resource recovery criteria set out by this table.
Municipal solid waste (MSW) – kerbside bin collection (excluding kerbside collected recyclable material, and kerbside collected green waste).	MSW collected by or on behalf of a council through kerbside bin collection is eligible for use in thermal EfW activities, including the production of RDF, provided that the council kerbside bin collection system: <ul style="list-style-type: none"> • provides a minimum mandatory 3-bin collection system per household for the separate collection of kerbside collected recyclable material, kerbside collected green waste, and general waste, and • includes a periodic kerbside waste audit program, that is able to identify the current kerbside MSW diversion percentage, and is undertaken in accordance with EPA approval.

Waste type	Resource Recovery Criteria
<p>Non-recoverable waste arising from a materials recovery facility (MRF), or other approved facility⁷ operating under an EPA Resource Recovery Approval processing MSW, Commercial and Industrial Waste, or Construction and Demolition Waste.</p>	<p>Eligible for use in thermal EfW activities provided that:</p> <ul style="list-style-type: none"> • it can be demonstrated that there is no market available⁸ for the material resource recovery, recycling or reuse of this waste in accordance with the waste management hierarchy, and • the MRF, MBT (or other approved facility) is operating in accordance with a Resource Recovery Approval.
<p>Waste arising from the mechanical and/or biological treatment (MBT) of waste</p>	
<p>Source separated or homogeneous waste materials⁹, as approved in writing by the EPA.</p>	<p>Eligible for use in thermal EfW activities provided that:</p> <ul style="list-style-type: none"> • the waste is homogeneous, and • it can be demonstrated that there is no market available for the material resource recovery, recycling or reuse of this waste in accordance with the waste management hierarchy.
<p>Aggregated recoverable materials as described by Schedule 4 of the Waste to Resources Policy¹⁰ and kerbside collected recyclable material and kerbside collected green waste</p>	<p>Must not be used in a thermal EfW activity.</p>

⁷ Including an EfW activity holding an Resource Recovery Approval.

⁸ Note on 'market availability': Thermal EfW activities can require waste supply contracts of 20–30 years in duration. Where referenced by Table 1, the EPA requires that the potential availability of a market for material recovery of these waste streams is critically assessed by a proponent, addressing potential market availability from the present up to 10 years and as otherwise reasonably foreseeable. Economic viability of accessing a potential material recovery market should also be taken into account in this assessment.

⁹ Note, the intent of this criteria is to allow for the use of emerging advanced waste treatment technologies such as pyrolysis of source-segregated homogeneous waste streams with limited or no other material resource recovery market. The EPA will assess proposals of this nature with regard to all relevant legislation, the Waste Management Hierarchy, and the Waste Strategy.

¹⁰ Those aggregated recoverable materials referred to by the Waste to Resources Policy are set out in the [Glossary](#).

7 Thermal efficiency criteria

The overall thermal efficiency of EfW activities must be demonstrated in order to distinguish the genuine recovery of energy from waste as opposed to the incineration of waste with an ancillary energy recovery process attached to it.

7.1 Refuse derived fuel

The EPA RDF Standard requires the following to be considered when determining the efficiency of use:

- There must be an acceptable and genuine energy benefit demonstrated by the proposal.
- The RDF use must constitute beneficial energy recovery via combustion in an industrial activity rather than disposal via incineration.
- The RDF must have a valuable net calorific value.
- RDF combustion must be efficient (including that the fuel is produced to maximise net calorific value and burn rate).
- RDF combustion must be beneficial and effective (such that it will replace or supplement the use of a fossil or other standard commercial fuel in an industrial process).

7.2 Dedicated thermal EfW activities

Proponents of dedicated thermal EfW activities must demonstrate that the activity will meet the minimum energy recovery level using the R1 Efficiency Indicator as defined by the European Union Industrial Emissions Directive.

A factor equal to or greater than 0.65 is required in order to demonstrate energy recovery consistent with established international practice. The use of combined heat and power will increase overall efficiency and assist in meeting the R1 indicator of 0.65 or greater.

The R1 Energy Efficiency formula¹¹:

$$R1 = \frac{E_p - (E_f + E_i)}{0.97 \times (E_w + E_f)}$$

Where:

- E_p : means annual energy produced as heat or electricity. It is calculated with energy in the form of electricity being multiplied by 2.6 and heat produced for commercial use multiplied by 1.1 (GJ/year).
- E_f : means annual energy input to the system from fuels contributing to the production of steam (GJ/year).
- E_w : means annual energy contained in the treated waste calculated using the net calorific value of the waste (GJ/year).
- E_i : means annual energy imported excluding E_w and E_f (GJ/year).
- 0.97: a factor accounting for energy losses due to bottom ash and radiation.

For further information visit: [Guidelines on the interpretation of the R1 energy efficiency formula for incineration facilities dedicated to the processing of Municipal Solid Waste according to Annex II of Directive 2008/98/EC on waste.](#)

¹¹ European Union Waste Framework Directive 2008/98/EC.

Note, the R1 Energy Efficiency formula cannot be used to demonstrate the efficiency of dedicated pyrolysis processes. The overall efficiency of a pyrolysis process must be demonstrated by an efficiency analysis having regard to:

- The efficiency of the initial thermal treatment stage having regard to the resulting products (syngas or oils).
- Efficiency of any subsequent energy conversion or combustion process to which the thermal treatment stage is attached or associated with, and
- Net energy created by undertaking the process.

8 Waste levy liability

RDF produced with EPA approval in accordance with the RDF Standard, Resource Recovery Criteria and Thermal Efficiency Criteria, is no longer considered to constitute a waste under clause 4(a) of the Waste to Resources Policy, and its use in a thermal EfW activity does not attract the payment of the waste levy.

Thermal EfW activities receiving waste in accordance with the Resource Recovery Criteria, Thermal Efficiency Criteria, and holding an EPA Resource Recovery Approval will not be liable for payment of the waste levy, with the exception of thermal EfW activities receiving kerbside collected MSW.

For thermal EfW activities receiving kerbside collected MSW from a council or any other party contracted by a council, it is an additional requirement to demonstrate that the council's kerbside collection system achieves the current MSW diversion target published within the Waste Strategy. The waste levy applies to the balance of kerbside collected MSW from a council or any other party contracted by a council, falling short of the published diversion target when received by a thermal EfW activity. Diversion of waste must be demonstrated at the kerb – a minimum three-bin system must be used that provides for source segregation of recyclable material and green waste.

For example:

- The Waste Strategy (2015–2020) provides a 60% diversion target for kerbside collected MSW.
- The remaining 40% of non-diverted kerbside MSW that would otherwise be disposed to landfill does not attract payment of the waste levy when received by a thermal EfW activity, provided that the Resource Recovery Criteria and Thermal Efficiency Criteria are met (see sections 6 and 7).

Where a kerbside collection system falls short of the published diversion target, the balance of kerbside collected MSW making up the difference between the published diversion percentage and the actual diversion percentage achieved, will attract the payment of the waste levy when this waste is received from a council or any other party contracted by a council.

For example:

As at 2019, where a kerbside collection system achieves a 55% diversion rate, falling 5% short of the published 60% diversion target, 5% of the MSW received from that kerbside collection system will attract the payment of the waste levy when received by a thermal EfW activity.

Future kerbside collected MSW diversion targets published in the Waste Strategy must be met to avoid the payment of the waste levy when this waste is received by a thermal EfW activity. As such, the levy liability going forward is subject to change should the published Waste Strategy diversion targets change (currently reviewed at 5-year intervals).

All waste produced as a result of an EfW activity requiring subsequent disposal to landfill will attract the payment of the waste levy, and may require treatment in order to comply with landfill facility acceptance conditions and published EPA waste classification criteria¹².

¹² https://www.epa.sa.gov.au/files/4771346_current_waste_criteria.pdf

EPA publications

Guidelines

Stockpile management: Waste and waste derived products for recycling and reuse (2019),
https://www.epa.sa.gov.au/files/4771349_guidelines_stockpile.pdf

Ambient air quality assessment (2016), https://www.epa.sa.gov.au/files/12194_ambient_aq_assessment.pdf.

Evaluation distances for effective air quality and noise management (2019),
https://www.epa.sa.gov.au/files/12193_eval_distances_2019.pdf.

Waste definitions (2009), https://www.epa.sa.gov.au/files/4771336_guide_waste_definitions.pdf .

Information Sheets

Undercover storage requirements for waste/recycling depots (2010),
https://www.epa.sa.gov.au/files/4771348_info_storage_waste.pdf.

Position Statements

Air quality and the South Australian Planning System (2016),
https://www.epa.sa.gov.au/files/11363_aq_position_statement.pdf

Noise and the South Australian Planning System (2016),
https://www.epa.sa.gov.au/files/11364_noise_position_statement.pdf

Waste and the South Australian planning system (2016),
https://www.epa.sa.gov.au/files/12329_waste_position_statement.pdf.

Waste depots and the South Australian planning system (2016),
https://www.epa.sa.gov.au/files/12328_waste_depot_position_statement.pdf.

Standards

Production and use of refuse derived fuel (2009), https://www.epa.sa.gov.au/files/4771351_standard_rdf.pdf.

Production and use of waste derived soil enhancer (2010), https://www.epa.sa.gov.au/files/4771360_standard_wdse.pdf.

Production and use of waste derived fill (2013), https://www.epa.sa.gov.au/files/4771359_standard_wdf.pdf

Glossary

Aggregated recoverable materials: in accordance with Schedule 4 of the *Environment Protection (Waste to Resources) Policy 2010*):

- Cardboard and paper waste aggregated for resource recovery separately from other waste.
- Glass packaging aggregated for resource recovery (whether alone or with other recyclables).
- Metals such as aluminium, copper, steel, iron or a blend or alloy of any such metals aggregated for resource recovery (whether alone or with other recyclables), other than metal products with components of different metals that cannot be readily separated.
- PET or HDPE plastic packaging aggregated for resource recovery (whether alone or with other recyclables).
- Vegetative matter aggregated for resource recovery and collected by a council by a kerbside waste collection service operated as a separate collection service for such waste, other than such waste collected from within a quarantine area declared under the *Fruit and Plant Protection Act 1992*.
- PP or LDPE plastic packaging aggregated for resource recovery (whether alone or with other recyclables).
- PVC or PS plastic packaging aggregated for resource recovery (whether alone or with other recyclables).

Anaerobic digestion: involves a series of processes in which micro-organisms break down biodegradable material to biogas in the absence of oxygen. It is used for industrial, agricultural or domestic purposes to manage waste and/or produce fuels for energy generation.

Commercial and industrial waste: the solid component of the waste stream arising from commercial, industrial, government, public or domestic premises (not collected as Municipal solid waste or MSW).

Construction and demolition waste: the solid component of waste stream arising from the construction, demolition or refurbishment of buildings or infrastructure but does not contain municipal solid waste, commercial and industrial waste, listed waste, hazardous waste or radioactive waste.

Direct combustion of waste: the most commonly used technology for converting fuel to heat and/or electrical energy. During direct combustion, waste or a fuel derived from waste is burnt in excess oxygen (from air) to produce heat or release the energy contained in the fuel. Excess oxygen/air means there is more air available than necessary for the combustion process. See also **Thermo-chemical conversion/decomposition**.

Gasification: a process that converts organic or fossilised organic materials such as coal, at elevated temperatures and with controlled amounts of oxygen, into a synthetic gas (syngas) comprising carbon monoxide, hydrogen, carbon dioxide, nitrogen, methane and other low molecular weight organic molecules.

Hazardous waste: listed waste having a characteristic described in Schedule A, List 2 of the *National Environment Protection (Movement of controlled waste between States and Territories) Measure*, as amended from time to time. Hazardous waste includes any unwanted or discarded material (excluding radioactive material), which because of its physical, chemical or infectious characteristics can cause significant hazard to human health or the environment

Incineration: the thermal destruction of waste for the primary purpose of disposal, with or without recovery of energy. The direct combustion of waste is incineration. The term 'incineration' generally means 'the act of burning to ashes' however the above definition is the meaning used by the EPA in relation to waste.

Kerbside collected green waste: means green waste collected during the regular domestic council waste collection.

Kerbside collected MSW: has the same meaning as **Municipal solid waste – kerbside bin collection**.

Kerbside collected recyclable material: means the segregated portion of **Municipal solid waste – kerbside bin collection** consisting of dry recyclable materials including beverage containers, paper, cardboard, plastics, glass and metals.

Listed waste: wastes listed in Part B of Schedule 1 of the *Environment Protection Act 1993*.

Materials recovery facility (MRF): a depot for the treatment of waste for resource recovery, other than a composting depot.

Medical waste: listed in Part B of Schedule 1 of the *Environment Protection Act 1993*.

Municipal solid waste – kerbside bin collection: the solid component of the waste stream arising from mainly domestic but also commercial, industrial, government and public premises including waste from council operations, services and facilities that is collected by or on behalf of the council via kerbside collection, but does not contain commercial and industrial waste, listed waste, hazardous waste or radioactive waste.

Pyrolysis: is described as a thermo-chemical decomposition of organic or inorganic material, eg synthetic tyres, at elevated temperatures in the absence of oxygen. Pyrolysis can occur in a vacuum or under any pressure and typically occurs at operating temperatures of 250–430°C and generates oils, tars, char residue and syngas.

Refuse derived fuel (RDF): a fuel material produced from waste that is otherwise destined to landfill and which will not cause harm to the environment or human health when used to beneficially replace or supplement a fossil or other standard commercial fuel in an industrial process. RDF must be produced to an approved consistent and fit for purpose specification with sufficiently high net calorific value by segregating, targeting and processing specific wastes. The EPA regulates RDF through its *Standard for the production and use of refuse derived fuel*.

Thermo-chemical conversion/decomposition: gasification and pyrolysis are thermo-chemical conversion/decomposition processes.

Waste: as defined under the *Environment Protection Act 1993*

(1) For the purposes of this Act, waste means—

- (a) any discarded, dumped, rejected, abandoned, unwanted or surplus matter, whether or not intended for sale or for purification or resource recovery by a separate operation from that which produced the matter; or
- (b) any matter declared by regulation to be waste for the purposes of this Act (following consultation by the Minister on the regulation with prescribed bodies in accordance with the regulations); or
- (c) any matter declared by an environment protection policy to be waste for the purposes of this Act, whether or not of value.

(2) However, waste does not include—

- (a) an approved recovered resource whilst it is being dealt with in accordance with the declaration of that resource— see section 4A; or
- (b) anything declared by regulation or an environment protection policy not to be waste for the purposes of this Act,

even though the resource or the thing so declared might otherwise, but for the declaration, fall within the definition of waste in subsection (1).

Appendix 1 Clause 18 of the Environment Protection (Air Policy) 2016

18—Matters relating to Part 6 of Act

- (1) In determining any matters under Part 6 of the Act in relation to an activity (including a related development), the Authority must take into account the following matters (to the extent to which they are relevant):
- (a) **ground level concentrations** – whether the activity has resulted, or may result, in the concentration of a pollutant specified in column 1 of the table in Schedule 2 clause 2 exceeding the maximum concentrations specified in column 4 or 5 for that pollutant over the averaging time specified in column 3 for that pollutant (based on evaluations at ground level using a prescribed testing, assessment, monitoring or modelling methodology for the pollutant and activity);
 - (b) **odour levels** – whether the activity has resulted, or may result, in the number of odour units specified in column 2 of the table in Schedule 3 being exceeded for the number of persons specified in column 1 over a 3 minute averaging time 99.9% of the time (based on evaluations at ground level using a prescribed testing, assessment, monitoring or modelling methodology for the pollutant and activity);
 - (c) **stack emissions** – if the Authority is satisfied that it is not reasonably practicable or feasible to make evaluations in relation to the activity under paragraph (a) or (b) – whether the activity (being an activity specified in column 2 of the table in Schedule 4) has resulted, or may result, in the emission to air of a pollutant specified in column 1 of the table in Schedule 4—
 - (i) at a level exceeding that specified for the pollutant in column 3; or
 - (ii) in contravention of a requirement (if any) specified for the pollutant in column 4,
 (based on evaluations at the stack using a prescribed testing, assessment, monitoring or modelling methodology for the pollutant and activity);
 - (d) **evaluation distances** – whether the assessment requirements set out in the document entitled Evaluation Distances for Effective Air Quality and Noise Management (2019) prepared by the Authority give rise to requirements for separation distances between the activity and other premises;
 - (e) **localised air quality objectives** – any localised air quality objectives (within the meaning of clause 14) that apply in relation to the activity;
 - (f) **any other kind of air pollution** – whether the activity has resulted or may result in the pollution of the air in any other manner;
 - (g) **requirements to be imposed on all relevant persons** – the requirements that should, in the event of an environmental authorisation being granted, be imposed on all relevant persons for the purposes of preventing or minimising the pollution of the air or its harmful effects.
- (2) In this clause—
- prescribed testing, assessment, monitoring or modelling methodology, for a pollutant or activity, means—
- (a) a testing, assessment, monitoring or modelling methodology set out for the pollutant or activity in—
 - (i) Ambient Air Quality Assessment 2016 prepared by the Authority; or
 - (ii) Emission Testing Methodology for Air Pollution 2012 prepared by the Authority; or
 - (b) some other testing, assessment, monitoring or modelling methodology approved by the Authority for the pollutant or activity.