



Waste incineration: A climate, health, and sustainability threat.



Contact:

Jane Bremmer, NTN Zero Waste Coordinator

0432 041397

Joanna Immig, NTN Coordinator

02 66871527

The **National Toxics Network (NTN)** is a community-based network working to ensure a toxic-free future for all. Formed in 1993, NTN has grown as a national network giving a voice to community and environmental organisations across Australia, New Zealand and the South Pacific.

NTN is the Australian focal point for the [International Pollutants Elimination Network \(IPEN\)](#) and works towards the full implementation of the [Stockholm Convention on Persistent Organic Pollutants \(POPs\)](#) 2001 and other global chemical conventions. NTN is a member of the NGO delegation to the POPs Review Committee which is the United Nations scientific committee assessing new POPs nominations.

NTN represented Australian and global NGOs at the [OECD Chemical Joint Meetings](#) and was actively involved in the [Intergovernmental Forum on Chemical Safety \(IFCS\)](#), providing an Australian focal point for their INFOCAP information and capacity building program. NTN participates in the [Strategic Approach to International Chemical Management](#) and is part of the NGO delegation to the [negotiations for a Mercury treaty](#).

NTN supports communities involved in hazardous waste management, pesticide pollution and environmental health issues. Our committee members are involved in a range of national advisory bodies including the Hazardous Waste Reference Group, the Stockholm Stakeholders Reference Group, the National Industrial Chemicals Notification Assessment Scheme (NICNAS) Community Engagement Forum and Australian Pesticides and Veterinary Medicines Authority committees. We also participate in related technical advisory panels.

Greenhouse gas and air quality impacts of incineration and landfill

This briefing paper summarises the key findings of the Eunomia report NTN commissioned – *Greenhouse gas and air quality impacts of incineration and landfill (2022)*.

The Eunomia report investigated the potential impacts of several residual waste treatment options, particularly waste to energy incineration scenarios, on

greenhouse gas emissions and air quality. Waste to energy incineration is being actively promoted and considered by Governments across Australia.

Australia generates comparatively large volumes of waste per capita and relies on landfill as the main residual waste disposal technology – that being the waste left over after composting, reusing, and recycling.

Residual waste volumes in Australia, like elsewhere in the world, are increasing rapidly due to issues like Fast Moving Consumer Goods (FMCG), single use plastic products, globalisation and trade and a disposable culture that relies on a linear economy of *take, make, waste*.

At the same time, our world is facing catastrophic climate change threats, resource depletion, biodiversity collapse, chemical and toxic contamination threats to our marine and terrestrial ecological systems pushing us closer and closer to irreversible tipping points.

Waste, as a representation of our entire materials production systems, provides a unique window into just how damaging our linear economy is and why we must move urgently to a Zero Waste and Circular Economy future if we want to meet net zero climate change targets.

In March 2022, [*the Climate Change 2022 Impacts, Adaptation and Vulnerability Working Group II Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*](#), warned that time is rapidly running out to keep our planet below a 1.5C temperature increase and that urgent action is needed to drastically reduce greenhouse gas emissions.

In this context, the widespread introduction of waste to energy incineration in Australia is cause for significant concern. Waste incinerators emit large volumes of GHG's and toxic air pollutants and create tonnes of hazardous ash that requires disposal.

Waste incinerators maintain a linear approach to resource use, further exacerbating climate change by increasing the extraction of new raw materials to feed increasing materials production systems.

To better understand the direct climate and pollution impacts that residual waste technologies in Australia create, NTN engaged Eunomia Consulting UK to assess the current and proposed waste to energy incinerators, landfills and other residual waste technologies in Australia.

Method

Eunomia's methodology included consideration of the following treatment systems:

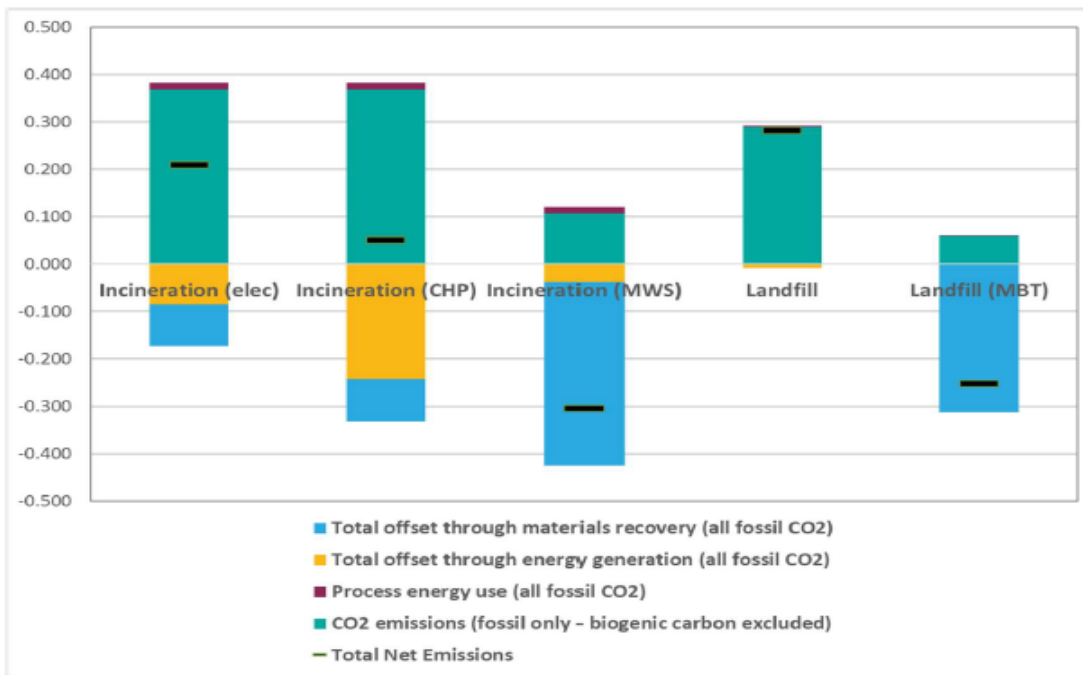
1. Incineration ('straight')
2. Incineration with Mixed Waste Sorting (MWS)
3. Incineration with Heat production (CHP)
4. Landfill ('straight')
5. Landfill with Advanced Mechanical Biological Treatment (MBT)
6. Refuse Derived Fuel Sent to Co-Incineration

Results and discussion

The study concludes:

Incineration cannot be considered a 'green' or low carbon source of electricity, as the emissions per kWh of energy produced are higher than CCGT, renewables, and the likely aggregated future marginal source of electricity in Australia. The carbon intensity deficit of residual waste incinerators will increase as the electricity grid decarbonises. The use of incineration is therefore also incompatible with the achievement of local net zero climate change targets in respect of emissions from energy generation, unless coupled with carbon capture and storage. This technology is not yet commercially viable, and its use will considerably increase the cost of waste treatment.

Figure 3-1 GHG impacts - Central scenario



Key to the challenges facing Australia in both attempting to meet net zero climate change targets while addressing Australia’s increasing residual waste volumes, is the urgent need to invest in residual waste pre-treatment.

The Eunomia report shows that landfill with pre-treatment of residual waste outperforms incineration. However, this fact is not being given the attention it deserves in any narrative by industry or government about future investment in waste management technologies in Australia.

Indeed, the dominant narrative in Australia, reflected in Government waste management policies, is that landfill must be avoided at all costs and that incineration provides a better alternative. Perversely, Australia’s Zero Waste to Landfill policy is driving a massive push towards waste incineration.

As the Eunomia report demonstrates, landfill with pre-treatment emits less GHGs and toxic air pollutants than incineration, this is further enhanced when Landfill Gas Capture technology is also utilised.

Health costs associated with residual waste disposal technologies

The Eunomia report also demonstrates that the air quality impacts of the modelled scenario's show that landfill with pre-treatment delivers the lowest cost for air quality impacts per tonne of waste treated.

Table 3-3 Air quality impacts of waste treatment systems – central case

	Air Quality Impacts, \$ per tonne of waste treated ¹				
	Landfill	Landfill with bio-stabilisation	Incineration		Incineration with pre-treatment ²
			Typical	Low NO _x	
NH ₃	\$7.27	\$2.93			
PM2.5	\$0.23	\$0.04	\$9.18	\$9.18	\$1.07
SO _x	\$0.32	\$0.05	\$8.08	\$8.08	\$0.75
NO _x	\$2.05	\$0.14	\$17.51	\$3.84	\$8.65
TOTALS	\$9.87	\$3.16	\$34.77	\$21.10	\$10.47
Notes					
1. Impacts consider the direct emissions from facilities, excluding the potential impact of avoided emissions occurring elsewhere (e.g., energy generation and recycling).					
2. Assuming typical performance of incineration facilities					

Recommendations

Australia's waste management is at a crossroads. The Prime Minister announced an "Australian wide waste export ban". The large volumes of plastic (and other) waste that Australia has exported, primarily to the Asia Pacific region, has come to an end and this is good outcome.

The new federal Waste and Recycling Act enshrines a new era for waste management in Australia and heralds the start of a massive investment in waste recycling infrastructure.

On closer inspection however, Australia's waste policies and industry activity show these noble aims look more like a shadow plan to build plastic reprocessing facilities to turn plastic waste into fuel, perpetuating fossil fuel dependence, while also providing justification to roll out waste to energy incineration and co-incineration infrastructure across Australia subsidised with public funds.

Considering the findings of the Eunomia report, and other international studies and policy direction, the National Toxics Network advocates that we should take a different road and recommends:

1. The Australian government place a moratorium on all waste to energy incineration projects.
2. The Australian government amends the Renewable Energy Act to remove all renewable and clean energy subsidies for all waste to energy incineration and co-incineration technologies.
3. The Australian government prioritises investment in non-combustion residual waste disposal technologies.
4. The Australian government invests in existing and proven Zero Waste policy initiatives, that includes:
 - a. Better, more advanced waste collection and source separation methods and technologies for all waste streams.
 - b. More effective Material Recovery Facilities that reduce the generation of residual waste and increase the volumes of recyclable and reusable waste resources.
 - c. Increased separate collection and composting of all organic wastes.
 - d. Establishing targets of 90% removal of organic materials from landfill and diversion to composting.
 - e. Investment in Anaerobic Digestion as a preferred energy from waste technology.
 - f. Investment in dedicated residual waste research and treatment.
 - g. Investment in Landfill Gas Capture technology for all existing and future landfills.