



Toxics Free
Australia

Wollert community information session 6th April 2024

Waste to Energy Incineration



Zero Waste Australia



Zero Waste Australia

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more life - less stuff

“Zero Waste is a goal that is both pragmatic and visionary, to guide people to emulate sustainable natural cycles, where all discarded materials are resources for others to use. Zero Waste means designing and managing products and processes to reduce the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them. Implementing Zero Waste will eliminate all discharges to land, water, or air that may be a threat to planetary, human, animal or plant health.”

Definition of Zero Waste as adopted by the [Zero Waste International Alliance](#)



Waste - a window into our materials production systems



Australian waste export ban



The key to resolving the market challenges for mixed plastic is a combination of:

- **Better packaging design** to specify more recyclable polymers (e.g. PET, HDPE, LDPE and PP) and to ensure that all components, such as labels, caps and adhesives, are compatible in the recycling system. As strong markets exist for PET, HDPE, LDPE and PP, the preferred use of these plastics in consumer packaging, without other polymer additives, would see more packaging sorted and sold at higher prices. Plastics infrastructure analysis update – Project report Envisage Works – Positive Impact Consulting Page 19
- **More diligent sorting** of the recycled material by automated and manual means. This could be achieved, for example, by upgrading polymer sorting equipment to positively identify and sort additional polymer types, such as; LDPE, polypropylene and polystyrene packaging, and additionally, to improve the current positive polymer sorting of PET and HDPE to increase sorting recovery rates. This would reduce the amount of mixed, low value plastic product being generated.
- **Drive recycled content plastic products** market pull-through with more supportive procurement practices from governments at all levels and major businesses, particularly those with a product stewardship exposure.
- The potential introduction of **chemical recycling** technologies to enable the recycling of mixed polymer, composite and other hard to recycle plastic products (e.g. textiles). See Section 6 for an overview of chemical recycling.
- **Highly contaminated or composite scrap plastics** to waste to energy.



Malaysia to send up to 100 tonnes of plastic waste back to Australia

Environment minister says recycling sent from Australia included plastic bottles that were 'full of maggots'



▲ Malaysia cracks down on imported plastic - video

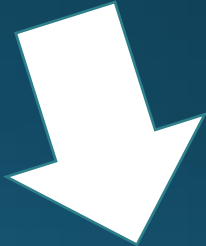




Chemical Recycling



Refuse Derived Fuel



Incineration

\$7.8 billion investment

Energising resource recovery:
the Australian
opportunity



Investment Outlook

ARUP



Avertas Energy, Perth

Project cost	\$700 million
CEFC commitment	\$90 million
Technology	Moving grate (thermal)
Throughput capacity	400,000 tonnes p.a.
Power capacity	38 MWe
Feedstocks	MSW and C&I waste
Carbon abatement	~400 ktCO ₂ -e p.a.
Jobs	Construction: 800 Operations: 60
Waste supply agreements	MSW take or pay contracts with Rivers Regional Council and City of Kwinana
Strategic equity investors	Macquarie Capital, DIF
Engineering, procurement and construction	Acciona
Operation and maintenance	Veolia
Tech provider	Keppel Seghers
ARENA grant	\$23m non-recoupable

Australian first
Australia's first large-scale EFW project to reach financial close. Setting a strong precedent for the bankability of an EFW, particularly with merchant exposure.

International recognition
Asia Pacific's Clean Energy Deal of the Year at the 2018 Project Finance International (PFI) Awards.

Trends in bioenergy and thermal energy from waste



East Rockingham Waste to Energy Facility, Perth

Project cost	\$511 million
CEFC commitment	\$57.5 million
Technology	Moving grate (thermal)
Throughput capacity	300,000 tonnes p.a.
Power capacity	29 MWe
Feedstocks	MSW and C&I
Carbon abatement	~300 ktCO ₂ -e p.a.
Jobs	Construction: 300 Operations: 50
Waste supply agreements	MSW and C&I contracts
Strategic equity investors	John Laing, Masdar Tribe, Acclona, HZI
Engineering, procurement and construction	Acciona, HZI
Operation and maintenance	Suez, HZI
Tech provider	HZI

Australian first
Australia's first subordinated debt tranche to an EFW and first EFW project to reach financial close with "waste arising" waste supply agreements.

International recognition
2019 IJ Global Awards Asia Pacific Waste Deal of the Year and Renewable Energy Waste-to-Energy deal of the year by The Asset magazine.

Asia Pacific Waste Deals of the Year!

Avertas waste incinerator
International recognition.
Asia Pacific's Clean Energy Deal
of the Year at the 2018 Project
Finance International (PFI)
Awards.

East Rockingham Waste Incinerator
International recognition 2019
IJ Global Awards Asia Pacific Waste
Deal of the Year and Renewable
Energy Waste-to-Energy deal of the
year by The Asset magazine.

International Conventions

Stockholm Convention

Waste Incineration is a major source of UPOP's. (ANNEXE C)

The objective of the Stockholm Convention on Persistent Organic Pollutants (POPs) is: "to protect human health and the environment from persistent organic pollutants." (Stockholm Convention 2010)

Australia is a signatory to the Stockholm Convention



Minamata Convention

Waste Incineration is in the top 5 industrial sources of Mercury emissions (ANNEXE D)

The objective of the Minamata Convention is to protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds.



Basel Convention

The Basel Convention aims to protect human health and the environment against the adverse effects resulting from the generation, management, transboundary movements and disposal of hazardous and other wastes.

The convention identifies residues arising from the incineration of household waste as hazardous waste.



Why are there no Environmental Impact Assessment requirements for Victorian projects?

Basel Convention D10 Page 13

UNITED
NATIONS



BC

UNEP/CHW.15/6/Add.4



Distr.: General
18 March 2021

English only

**Conference of the Parties to the Basel Convention
on the Control of Transboundary Movements of
Hazardous Wastes and Their Disposal
Fifteenth meeting**

Geneva (online), 26–30 July 2021*

Item 4 (b) (i) of the provisional agenda**

**Matters related to the implementation of the
Convention: scientific and technical matters:
technical guidelines**

Technical guidelines

Addendum

**Technical guidelines on the environmentally sound incineration of
hazardous wastes and other wastes as covered by disposal operations D10
and R1**

Note by the Secretariat



Brussels, 26.1.2017
COM(2017) 34 final

**COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN
PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL
COMMITTEE AND THE COMMITTEE OF THE REGIONS**

The role of waste-to-energy in the circular economy

- Legislation to require all member states to source separate organics for composting.

Policy Recommendations:

- those countries heavily dependent on landfills, should focus on rolling out effective separate collection, focus on organics and, in case they want to extract energy, look primarily at anaerobic digestion.
- those countries heavily dependent on incineration should raise taxes, end subsidies and other economic incentives, decommission old facilities and set up a moratorium for new ones.

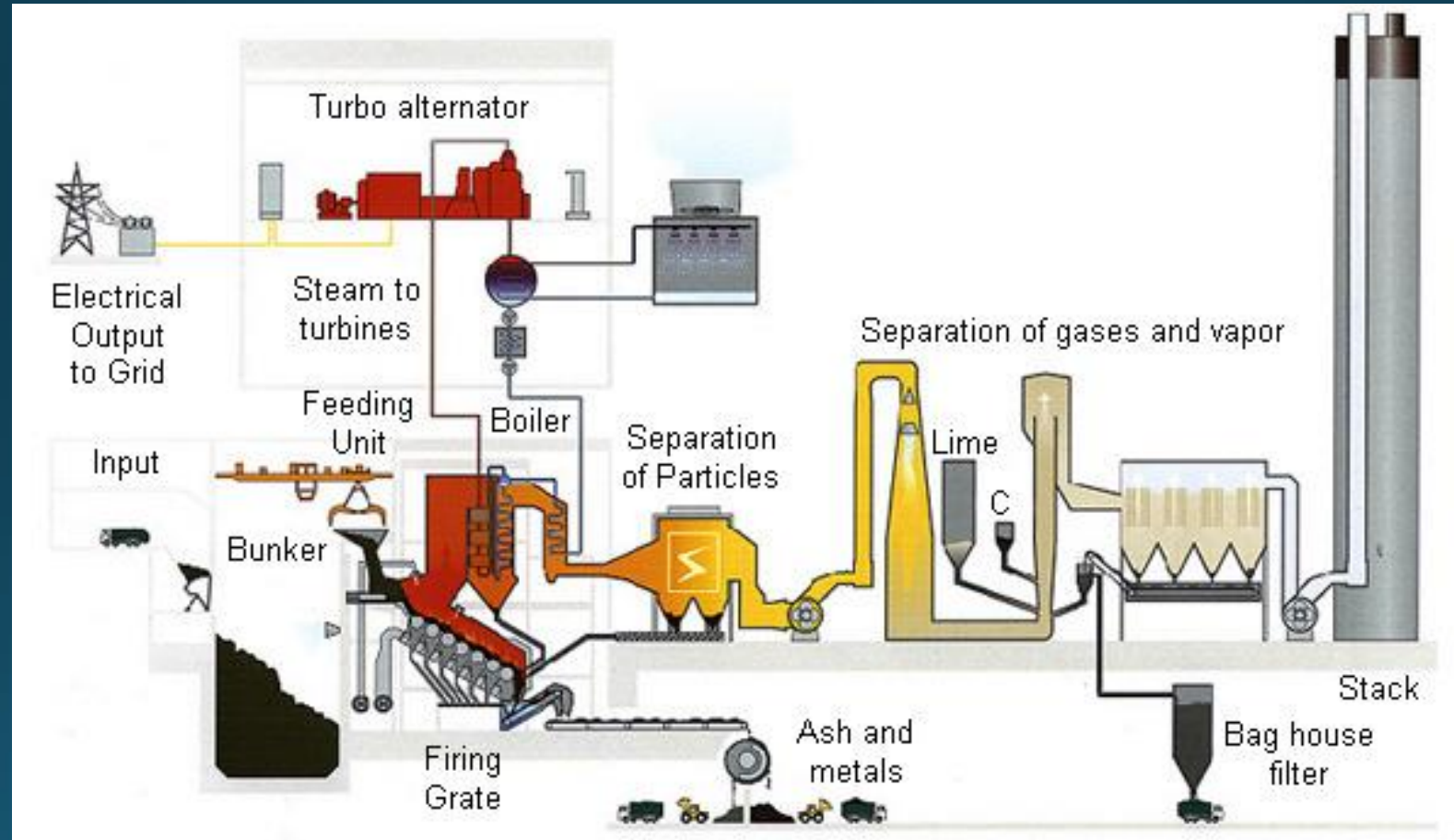


“It’s time to recognise that Waste-to-Energy incineration is a significant barrier to the circular economy because it burns valuable materials that could be recycled, composted or reused. Burning these resources comes at a high environmental and climate cost and given the urgent need to mitigate exacerbated climate change, we must phase out incineration as soon as possible to keep us below 1.5 degrees warming.”

Janek Vahk, ZWE Climate, Energy and Air Pollution Programme Coordinator

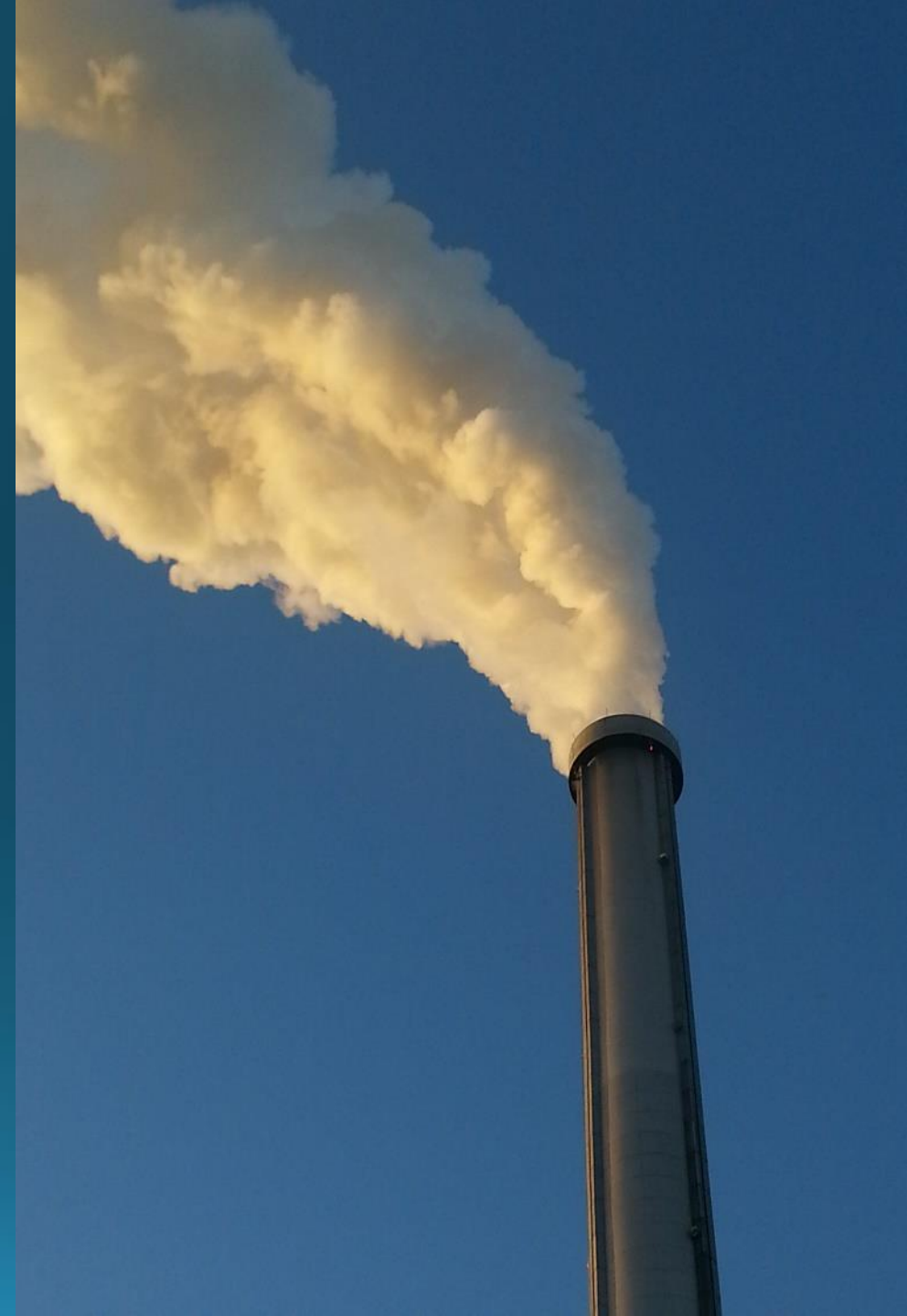


Mass combustion incineration



Incinerator air emissions

- oxides of nitrogen (NO_x)
- carbon monoxide (CO)
- sulfur dioxide (SO₂)
- particulates (TSP, PM₁₀, PM_{2.5} and nano-particles),
- volatile metals (As, Sb, Co, Cr, Cu, Pb, Mn, Ni, V)
- Mercury and cadmium
- acid gases (HCl, HF and SO₂)
- volatile organic compounds (VOCs),
- polycyclic aromatic hydrocarbons (PAHs),
- dioxins and furans.



Incineration & nanoparticles

Nanoparticles from incinerators contain:

- neurotoxic metals,
- stabilized free radicals
- thousands of newly synthesized compounds (including PCBs, dioxins and furans).
- Any toxic element used in commerce has the potential to end up in nanoparticles produced by incinerators



The global dangers of nanoparticles

- Nanoparticles are not efficiently captured by air pollution control devices,
- travel long distances,
- penetrate deep into the lungs



Children's environmental health protection – a policy driver



- Children are not little adults.
- Chemicals interrupt fundamental windows of development, causing long term impacts.
- Children inhale, ingest and absorb more pollution than adults.
- Children's toxic elimination processes are undeveloped.
- Chemical body burdens are increasing by generation.
- Our children (including in-utero) are the most vulnerable.

Protect children's environmental health and you protect the planet



AFTER INCINERATION: THE TOXIC ASH PROBLEM



IPEN Dioxin,
PCBs and
Waste
Working
Group

Re-print from
April 2005
Report



TOXIC ASH POISONS OUR FOOD CHAIN

Jindrich Petrlik and Lee Bell, IPEN

UPDATED: February 2020





Bachelor thesis in chemistry, 30HP

Analysis of PFAS in ash from incineration facilities from Sweden

Dennis Wohlin

Supervisor: Anna Kärman

January 2020 – June 2020

0



No. 2422
September 2021

PFAS in waste residuals from Swedish incineration plants

A systematic investigation

Johan Strandberg, Raed Awad, Dämien Johann Bolinius, Jing-Jing Yang, Jasmin Sandberg, Musbau Adeoye Bello, Laura Gobelius, Liselott Egelrud, Eva-Lena Härnwall



In cooperation with Avfall Sverige



Is incineration the terminator of plastics and microplastics?

Zhan Yang^{a,c}, Fan Lü^{a,b,c}, Hua Zhang^{a,b,c}, Wei Wang^{a,b}, Liming Shao^c, Jianfeng Ye^d, Pinjing He^{a,*}

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GRAPHICAL ABSTRACT



ARTICLE INFO

Editor: R. Teresa

Keywords:
Microplastics
Incineration
Bottom ash
Loss in ignition
Managed waste

ABSTRACT

It is widely accepted that incineration can permanently eliminate plastic waste. However, unburned material still exists in the bottom ash that is a solid residue from incinerators. In this study, microplastics extracted from bottom ash in 12 mass burn incinerators, one bottom ash disposal center and four fluidized bed incinerators were identified by micro-Fourier transform infrared spectroscopy. The results showed that bottom ash was a neglected microplastics source with an abundance of 1.9–565 n/kg, which indicated that per metric ton waste produce 360 to 102,000 microplastic particles after incineration. Nine types of plastics were identified, of which polypropylene and polystyrene were the predominant types. Microplastics sized between 50 µm and 1 mm accounted for 74 %. Granules, fragments, film, and fibers accounted for 43 %, 34 %, 18 %, and 5 % of the microplastics, respectively. The abundance of microplastics differed significantly with whether the local waste was source-separated, the local gross domestic product per capita, and the types of furnace. The global microplastic emission from incineration bottom ash was then estimated. Our observations provide empirical evidence proving that incineration is not the terminator of plastic waste, and bottom ash is a potential source of microplastics released into the environment.

1. Introduction

Microplastics (MPs, with size < 5 mm along their longest dimension) are now ubiquitous around the world (Allen et al., 2019;

Bergmann et al., 2019; Brandon et al., 2019; Zhang et al., 2020a), and have drawn increasing global attention for their potential toxicity (Huerta-Lwanga et al., 2016; Jacob et al., 2020). To reduce pollution by MPs, two principles are generally followed. One is to reduce plastic

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Article

Biomonitoring of Metals in Children Living in an Urban Area and Close to Waste Incinerators

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Received: 5 February 2020; Accepted: 10 March 2020; Published: 16 March 2020



Abstract: The impact of waste incinerators is usually examined by measuring environmental pollutants. Biomonitoring has been limited, until now, to few metals and to adults. We explored accumulation of a comprehensive panel of metals in children free-living in an urban area hosting two waste incinerators. Children were divided by georeferentiation in exposed and control groups, and toenail concentrations of 23 metals were thereafter assessed. The percentage of children having toenail metal concentrations above the limit of detection was higher in exposed children than in controls for Al, Ba, Mn, Cu, and V. Exposed children had higher absolute concentrations of Ba, Mn, Cu, and V, as compared with those living in the reference area. The Tobit regression identified living in the exposed area as a significant predictor of Ba, Ni, Cu, Mn, and V concentrations, after adjusting for covariates. The concentrations of Ba, Mn, Ni, and Cu correlated with each other, suggesting a possible common source of emission. Exposure to emissions derived from waste incinerators in an urban setting can lead to body accumulation of specific metals in children. Toenail metal concentration should be considered a noninvasive and adequate biomonitoring tool and an early warning indicator which should integrate the environmental monitoring of pollutants.

Keywords: metals; children; toenails; biomonitoring; waste; incinerators



Report

November 2015

Air Pollution from Waste Disposal: Not for Public Breath



EPIDEMIOLOGY

The health impacts of waste incineration: a systematic review

Peter W. Tait,^{1,2} James Brew,¹ Angelina Che,¹ Adam Costanzo,¹ Andrew Danyluk,¹ Meg Davis,¹ Ahmed Khalaf,¹ Kathryn McMahon,¹ Alastair Watson,¹ Kirsten Rowcliff,¹ Devin Bowles^{1,3}

Waste management encompasses the avoidance, reduction, collection, transport, storing and disposal of waste products from municipal, health and industrial sources. Current disposal strategies include recycling, landfill and incineration.^{1,2}

Waste management is of growing concern for communities globally and in Australia, with alternatives to traditional landfill increasingly being employed. Waste incinerators provide one alternative for reducing pressure on landfill. Modern incinerators are also designed to generate electricity, which increases their appeal to policymakers.³⁻⁵

Waste incinerator systems have traditionally been associated with emission of toxic pollutants, impacting human and environmental health. The Stockholm Convention provides international guidance on the safe management of persistent organic pollutants (POPs). The objective of the Convention is to minimise or prevent human exposure to POPs. It incorporates a precautionary and manufacturer/user pays approach. The guidelines cover waste incineration because this is a potential source of POPs, including dioxin-like compounds. Waste reduction is a key recommendation.⁶

Newer waste incinerator technologies are claimed to run more cleanly and with less environmental impact. Nevertheless, pollutants are still produced, with upgraded facilities requiring regular service to maintain emission levels.

Despite technological advancements, local and global health impacts from waste incinerators remain a concern for

Abstract

Introduction: Waste incineration is increasingly used to reduce waste volume and produce electricity. Several incinerators have recently been proposed in Australia and community groups are concerned about health impacts. An overview of the evidence on health effects has been needed.

Method: A systematic review of English language literature for waste incinerators and health using PRISMA methodology.

Results: A range of adverse health effects were identified, including significant associations with some neoplasia, congenital anomalies, infant deaths and miscarriage, but not for other diseases. Ingestion was the dominant exposure pathway for the public. Newer incinerator technologies may reduce exposure.

Discussion: Despite these findings, diverse chemicals, poor study methodologies and inconsistent reporting of incinerator technology specifications precludes firmer conclusions about safety.

Conclusion: Older incinerator technology and infrequent maintenance schedules have been strongly linked with adverse health effects. More recent incinerators have fewer reported ill effects, perhaps because of inadequate time for adverse effects to emerge. A precautionary approach is required. Waste minimisation is essential.

Implications for public health: Public health practitioners can offer clearer advice about adverse health effects from incinerators. We suggest improved research design and methods to make future studies more robust and comparable. We offer ideas for better policy and regulation.

Key words: waste, health, cancer, incineration, toxin

communities where they are being built.

Adverse health outcomes in populations near waste incinerators, including cancers and reproductive dysfunction, have been demonstrated in primary studies.⁷⁻¹² Unfortunately, precise evaluation of the health impact of waste incinerators can be difficult due to confounding factors, including pollution from industries, automobiles and agriculture chemicals, latency for carcinogenicity, subacute and delayed reproductive/intergenerational effects,

mobility of populations and other factors.

This systematic review aims to identify the health effects on human populations living near waste incinerators to inform the public and guide policymakers, and to define appropriate criteria for approving current and future waste incinerator proposals.

We reviewed primary studies investigating levels of known pollutants in human and environmental samples as well as the health effects associated with waste incineration pollutants.

1. Australian National University Medical School, Australian Capital Territory

2. Public Health Association of Australia, Australian Capital Territory

3. Council of Academic Public Health Institutions Australasia, Australian Capital Territory

Correspondence to: Dr Peter Tait, Public Health Association of Australia, Canberra, Australian Capital Territory; e-mail: apeter@bigpond.com

Submitted: September 2018; Revision requested: May 2019; Accepted: August 2019

The authors have stated they have no conflict of interest.

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Aust NZ J Public Health 2020; 44:40-8; doi: 10.1111/1753-6405.12930

The Health Effects of Waste Incinerators

4th Report of the British Society for Ecological Medicine

Second Edition
June 2008

Moderators: Dr Jeremy Thompson and Dr Honor Anthony

NCBI Resources How To

PubMed.gov US National Library of Medicine National Institutes of Health

PubMed Advanced

COVID-19 is an emerging, rapidly evolving situation. Get the latest public health information from CDC: <https://www.coronavirus.gov>. Get the latest research from NIH: <https://www.nih.gov/coronavirus>.

Format: Abstract Send to

Epidemiology, 2013 Nov;24(6):863-70. doi: 10.1097/EDE.0b013e3182a7121f.

Air pollution from incinerators and reproductive outcomes: a multisite study.

Candela S¹, Ranzi A, Bonvicini L, Baldacchini F, Marzaroli P, Evangelista A, Luberto F, Carretta E, Angelini P, Sterrantino AF, Broccoli S, Cordioli M, Ancona C, Forastiere F.

Author information

Abstract
BACKGROUND: The few studies that have investigated the relationship between emissions from municipal solid-waste incinerators and adverse pregnancy outcomes have had conflicting results. We conducted a study to assess the effects of air emissions from the eight incinerators currently in operation in the Emilia-Romagna Region of Italy on reproductive outcomes (sex ratio, multiple births, preterm births, and small for gestational age [SGA] births).


METHODS: We considered all births (n = 21,517) to women residing within a 4-km radius of an incinerator at the time of delivery during the period 2003-2010 who were successfully linked to the Delivery Certificate database. This source also provided information on maternal characteristics and deliveries. Each newborn was georeferenced and characterized by a specific level of exposure to incinerator emissions, categorized in quintiles of PM10, and other sources of pollution (NOx quartiles), evaluated by means of ADMIS-Urban system dispersion models. We ran logistic regression models for each outcome, adjusting for exposure to other pollution sources and maternal covariates.

RESULTS: Incinerator pollution was not associated with sex ratio, multiple births, or frequency of SGA. Preterm delivery increased with increasing exposure (test for trend, P < 0.001); for the highest versus the lowest quintile exposure, the odds ratio was 1.30 (95% confidence interval = 1.08-1.57). A similar trend was observed for very preterm babies. Several sensitivity analyses did not alter these results.

CONCLUSIONS: Maternal exposure to incinerator emissions, even at very low levels, was associated with preterm delivery.

“While the results were not consistent across the literature, based on a precautionary principle there is insufficient evidence to conclude that any incinerator is safe.”

Public Health Association of Australia 2020



Zero waste with EfW

📅 Thursday, 27th Oct
🕒 11:00 - 11:30


Today's EfW (Energy from Waste) plants recycle aggregate, metals, and clean flue gas; and, they achieve around 96% landfill diversion. The last 4% are soluble salts (harmless), heavy metals (mostly zinc), dust (inert), and organic residues. Together, they are the Flue Gas Treatment Residues (FGTR), which typically go to landfill either "as is" or are stabilised with cement.

Some projects further minimise the residues to the landfill with wet flue gas treatment, directing the soluble salts into wastewater or recycling. Optionally, a heavy metal concentrate can get extracted.

- Overview of options for dry and wet flue gas treatment and residue processing
- WtE wastewater treatment options
- Achieving 0.1% of residues to landfill

WtE & EfW

♥ Add to Plan



Marc Stammach

Managing Director, HZI Australia Pty Ltd

Dr Marc Stammach designed, marketed and built recycling and processing facilities for more than 30 years in environmental and large-scale investment industries in Australia and Europe. Today, he manages the local subsidiary of HZI to deliver EfW solutions to the Oceania market. The 300,000 tpy East Rockingham RRF is currently in construction and scheduled for operation in late 2022.

Richard Kirkman Veolia.

“We just need to convince them of the science and of the evidence that there aren’t problematic air emissions or any impact on their soils,” he says.

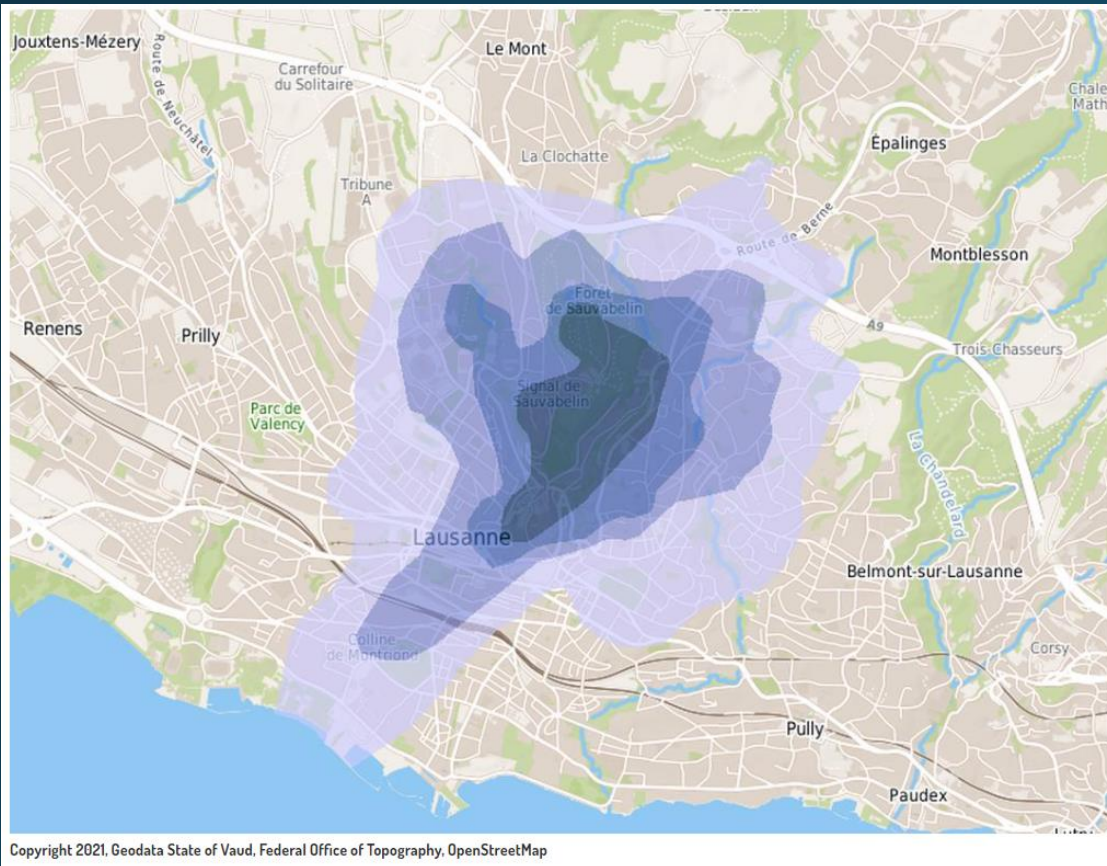
“New incinerators should be located away from areas of food production.”

“Food grown near an incinerator should be avoided.”

Public Health Association of Australia 2020



City of Lausanne, Switzerland



Citizens advised not to eat eggs or root vegetables and prevent children from being exposed to the soil.

In effect Lausanne is now a massive contaminated site.

Dioxin pollution affects a large part of the City of Lausanne



According to the latest analyzes from the canton of Vaud, dioxin pollutes a large part of Lausanne. / 7:30 p.m. / 2 min. / October 11, 2021

Discovered at the start of the year, soil pollution with dioxins concerns a good part of Lausanne: from the city center to Sauvabelin. In the two most affected areas, the canton recommends no longer consuming eggs and cucurbits produced on site.

State Councilor Béatrice Métraux presented an [inventory](#) on Monday which specifies the perimeter concerned by pollution with dioxins and furans. "It is a projection on the basis of the 126 sites which were analyzed", she explained to the press.

>> Reread: [From the dioxin pollution discovered in the soils of Lausanne](#)

The area extends over a large part of Lausanne, but also to the south of the municipalities of Mont-sur-Lausanne and Epalinges. Pully and Prilly are marginally concerned. According to the investigations, which are still ongoing, it seems to be confirmed that the fumes from the old Vallon incineration plant are involved.



2 min.
According to the latest analyzes from the canton of Vaud, dioxin pollutes a large part of Lausanne.
7:30 p.m.
On October 11, 2021 at 7:30 p.m.



2 min.
According to the latest analyzes from the canton of Vaud, dioxin pollutes a large part of Lausanne. Analysis by ecotoxicologist Nathalie Chèvre.
7:30 p.m.
On October 11, 2021 at 7:30 p.m.



6 min.
Dioxin pollution affects a large part of the city of Lausanne: interview with David Vernez
Forum
October 11, 2021 at 6:00 PM

12 million people in France advised by health authorities not to eat their own backyard eggs and produce.

Millions in France warned not to eat eggs from backyard chickens due to forever chemical pollution



By [Ian Smith](#)

Published on 21/11/2023 - 17:31 • Updated 22/11/2023 - 10:54

Ivry-Paris XIII waste incinerator: dioxin emissions were not measured for nearly 7,000 hours in 2020 and 2021



Zero Waste Australia

Media Statement

24th November 2023

Damning new evidence of under-reported incinerator pollution in France.

A lesson for Australian environmental regulators.

Following revelations by French Health authorities this week confirming that large parts of Paris are contaminated with Persistent Organic Pollutants (POPs), including Dioxin, our colleagues in France - Collectif 3R and [Toxicowatch](#), have [warned](#) that up to 7000 hours of incineration emissions went unmonitored over 2 years, resulting in food chain contamination and a ban on eating home produced eggs. The recommendation applies to the entire population of the 410 municipalities concerned.

Paris residents and [Collectif 3R](#) have long complained to authorities that the [Synton](#) incinerator (the largest in Paris) has been affecting the surrounding community and failing to comply fully with their operational license.

"French health authorities have yet to release their report, however serious questions must be raised as to why civil society groups such as Collectif 3R and independent scientists at [Toxicowatch](#), were forced to do the job of the regulators to prove the excessive pollution emissions and non-compliant operations of one of the most highly promoted waste incinerators in France." States Jane Bremmer Coordinator Zero Waste Australia.

"The seriousness of the contamination identified by [French authorities](#) - Persistent Organic Pollutants - which included Dioxin, PCB's and some PFAS - leaves many local communities as victims of environmental injustice and toxic exposure. This follows closely revelations that much of the city of [Lausanne, Switzerland](#) also has serious dioxin contamination associated with their waste incinerator resulting in similar health advisories on growing and consuming eggs and vegetables in the region. French authorities have now [warned](#) the public not to eat eggs from domestic henhouses from the Paris metropolitan area."

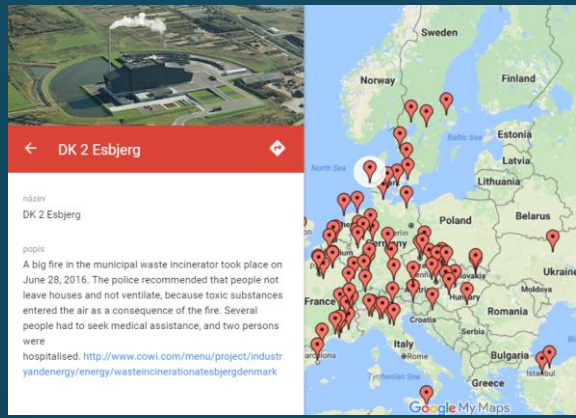
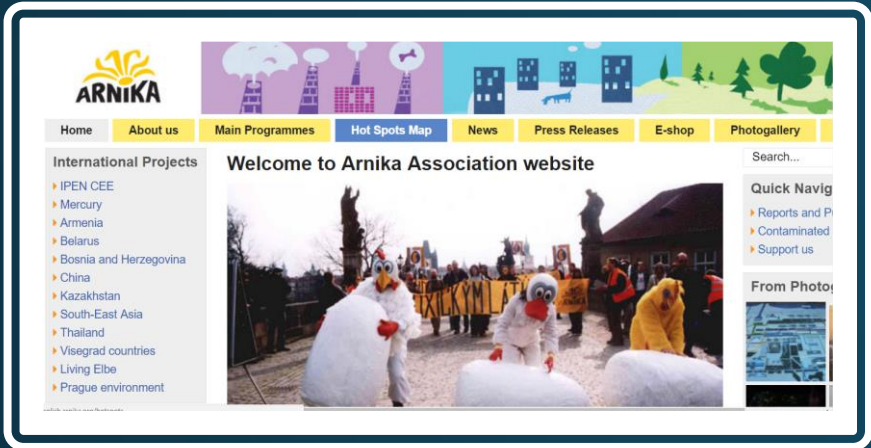
"Australia is currently facing a major waste incinerator industry push to establish these these polluting technologies as "the missing link" in Australia's waste management system. The Australian government needs to intervene immediately to place a moratorium on all approvals for waste to energy incinerator projects as this industry is incapable of coming clean on its real emissions and the threat they present to human health and our food supplies. We should learn from the contamination disasters in France and Switzerland."

"With communities in many regional food growing regions in [NSW](#), [Victoria](#) and [Queensland](#), facing large-scale waste to energy incinerator projects, a precautionary approach is urgently needed so as to avoid widespread contamination of the environment and food chain. Urgent action must also be taken now to reassess the [two largescale incinerators](#) being built close to residents in Western Australia."

"Australia already has a major [PFAS contamination problem](#). It would be indefensible for Australian state governments to proceed with the roll out of this industry while such damning evidence exists about the real pollution levels emitted by incinerators. [Recent studies](#) have shown that PFAS is not destroyed by incinerators but released via stack emissions and in the associated toxic ash.", warns Jane Bremmer Zero Waste Australia.

Melbourne Energy and Resource Facility





Fos-sur-Mer France 2013



Dumfries Scotland 2013



Grenoble France, 2016



Lysa nad Labem, Czech Republic 2013



Fuzfo Hungary 2010

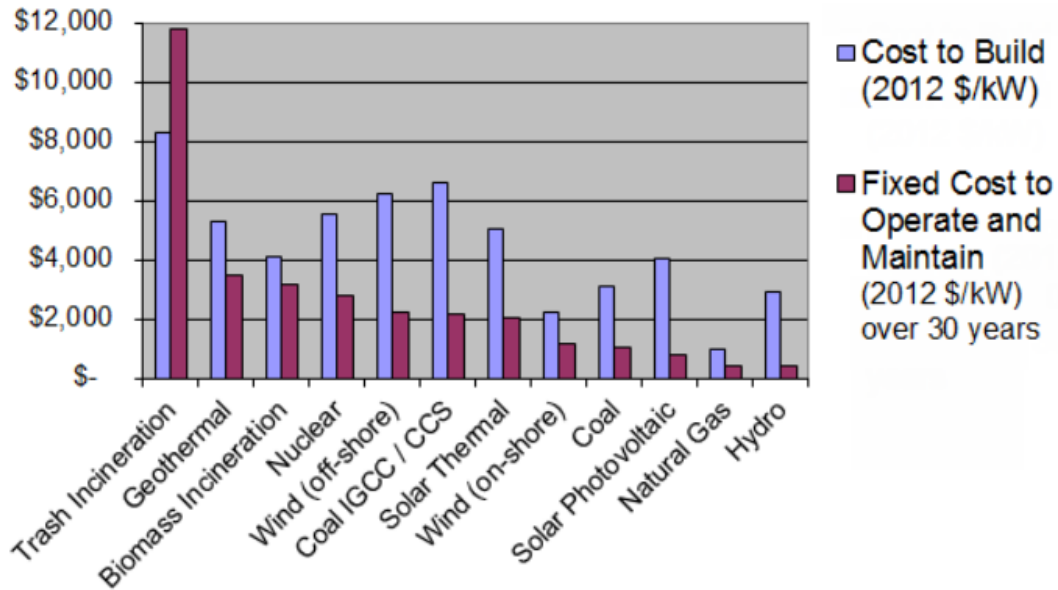


Rillieux la Pape, France, 12/11/2013



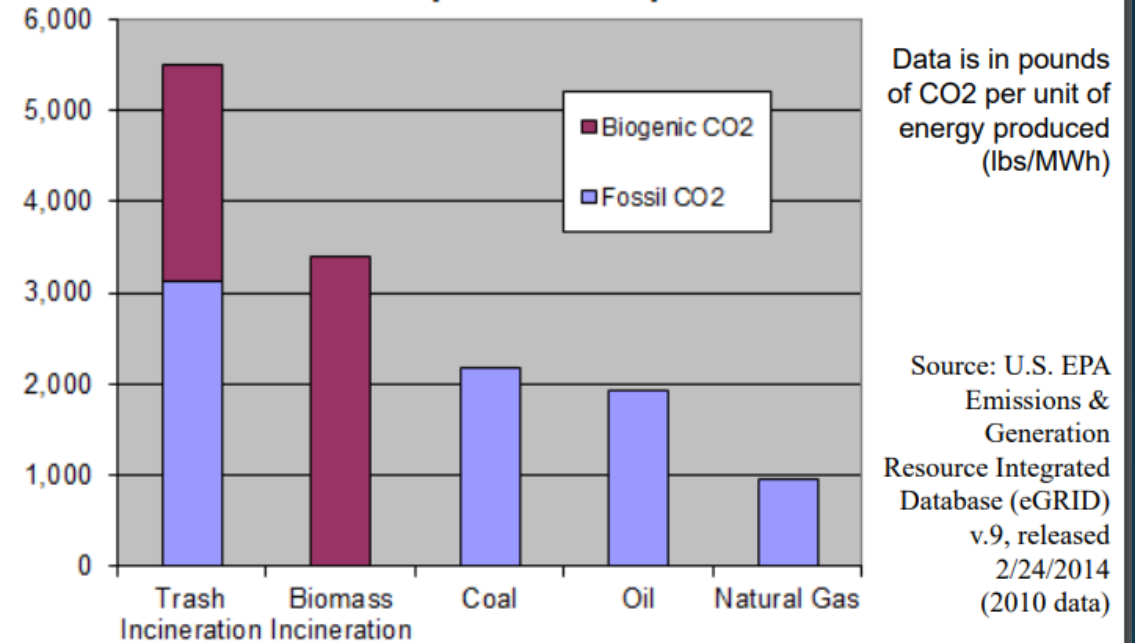
Esberg Denmark 2016

Most Expensive Way to Make Energy



Source: "Updated Capital Cost Estimates for Utility Scale Electricity Generating Plants," Energy Information Administration, April 2013, p.6, Table 1. Full report here: www.eia.gov/forecasts/capitalcost/pdf/updated_capcost.pdf

Global Warming Pollution Smokestack CO2 Emissions from U.S. Power Plants CO2 (lbs/MWh)



Data is in pounds of CO2 per unit of energy produced (lbs/MWh)

Source: U.S. EPA Emissions & Generation Resource Integrated Database (eGRID) v.9, released 2/24/2014 (2010 data)

Waste Incineration is the most expensive and polluting way to make energy or manage waste

Greenhouse Gas and Air Quality Impacts of Incineration and Landfill

Report to National Toxic Network

Ann Ballinger
William Shanks
Tamsin Miles
Sophie Degagny

January 2022

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

Report Conclusions:

Landfill with full pre-treatment (Zero Waste policies) provide the best option for Australia’s residual waste in terms of climate, air quality and public health costs.

No social licence to operate in Australia



QLD rejects incineration



Go Zero Waste. Don't incinerate. #BeyondRecovery



"Waste Incineration is the end of the line for fossil fuels."

NEWS RELEASE



Australia: Deep divide between Government and community narratives on toxics fuels anger and distrust, says UN expert

Sydney (8 September 2022) -- Where the Australian Government sees efforts towards stronger regulations to address the risks of chemicals and pollution, communities and civil society denounce the capture of the State for the benefit of mining, oil, gas, agrochemical and other corporate interests, said Marcos Orellana, UN Special Rapporteur on toxics and human rights, following an official visit to Australia.

End of Mission Statement by the UN Special Rapporteur on Toxics and Human Rights, Marcos A. Orellana, on his visit to Australia, 28 August to 8 September 2023

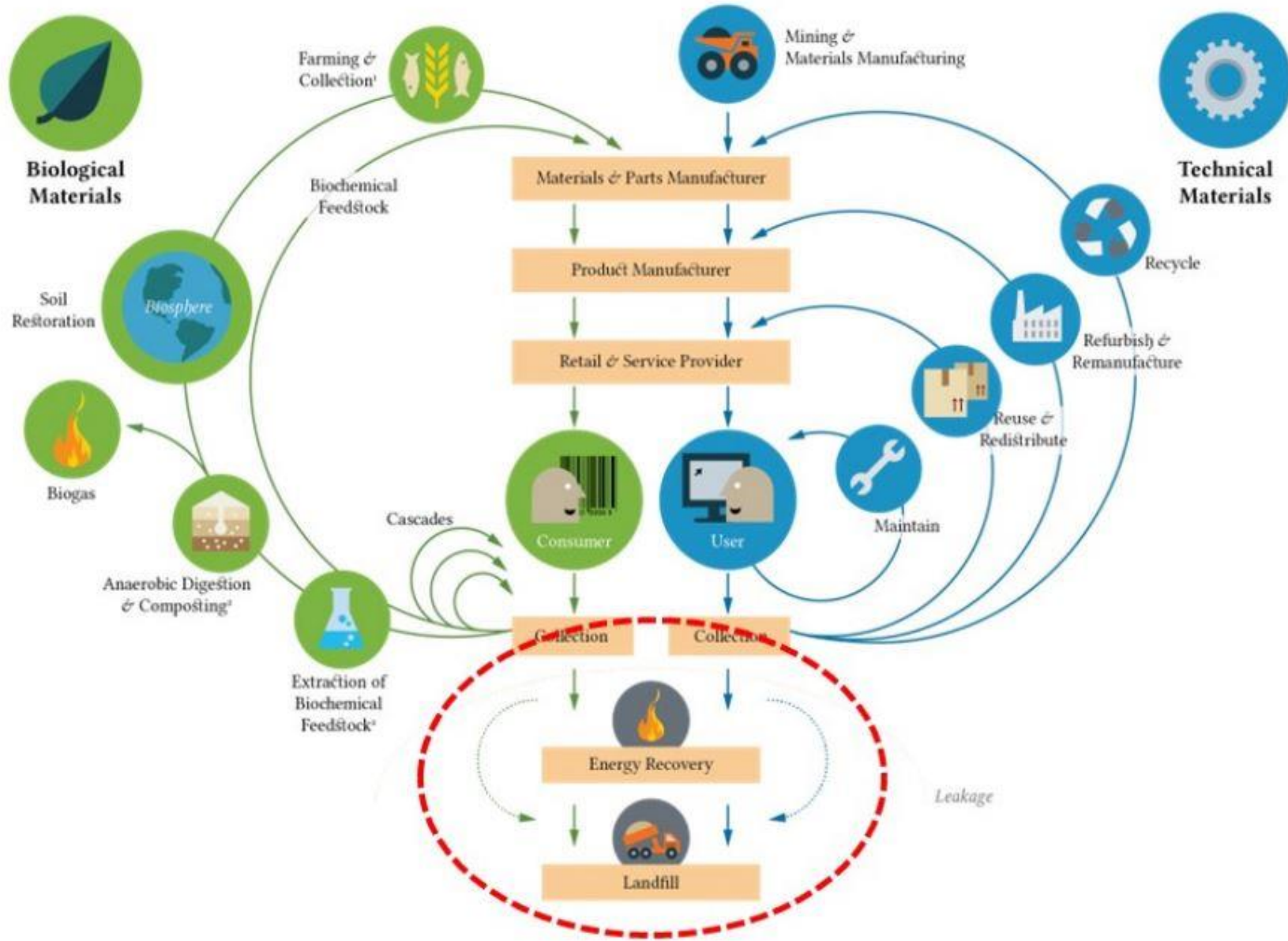
Canberra, 8 September 2023

Incineration

Waste incineration is the end of the line for fossil fuels. It reflects a linear process that is incompatible with a circular economy. Incineration imposes heavy health and other costs on local communities, and it is a significant source of greenhouse gases. It has been reported that even the most modern incinerators produce dioxins, furans and toxic ash.

The case of Tarago in New South Wales, where a waste incinerator has been proposed, is instructive on the potential health, agricultural and economic impacts. Tarago produces significant amounts of food for the State. Reportedly, the government has decided not to site incinerators in Sydney, and instead to site them in four regions, including Tarago. I heard from residents that they had not received adequate explanations for this decision, that it had been taken without consultations, and that they felt treated as second-class citizens, condemned to suffer the environmental injustice of disproportionate toxic impacts.

Ellen McArthur Foundation



THE
ZERO 

Untrashing the Planet One Community at a Time

WASTE

How cities and towns around the world are saying no to incinerators and wasteful product design

SOLUTION

and yes to radical recycling, reuse entrepreneurs, and the jobs they create

PAUL CONNETT

Foreword by Jeremy Irons

If we can't reuse it, recycle it or compost it, industry shouldn't be making it and we shouldn't be buying it!!!



European Zero Waste City Case Studies



What is the best disposal option for the “Leftovers” on the way to Zero Waste?

By

Dr. Jeffrey Morris

Dr. Enzo Favoino

Eric Lombardi

Kate Bailey



www.ecocycle.org/specialreports/leftovers

Toxics Elimination

POPS RECYCLING CONTAMINATES CHILDREN'S TOYS WITH TOXIC FLAME RETARDANTS

Joseph DiGangi, Ph.D., Jitka Strakova, Lee Bell
April 2017

ARNIKA
a toxics-free future

IPEN

Jitka Straková · Joseph DiGangi · Gösta K. Jensen

TOXIOIXOT LOOPHOLE
Recycling Hazardous Waste into New Products

Arnika 2018

ARNIKA **IPEN** **BUND** **Sverige**

Jindřich Petřík · Peter Behnisch · Joseph DiGangi

TOXIC SOUP
Dioxins in Plastic Toys

Arnika 2018

ARNIKA **IPEN** **BUND** **Sverige**

Toxic Recycling **POPs in Recycled & New Products**

Under the guise of "recycling," the POPs Treaty is allowing the continued use and global distribution of POPs.

OLD PRODUCTS

The Brominated Flame Retardants, Phthalates and Dioxins have been used in a wide variety of consumer products for many years. In 2001, these chemicals were recognized as POPs of global concern that need to be eliminated. The POPs and the other POPs listed in the Stockholm Convention.

NEW PRODUCTS

Recycled materials. A product contaminated with Brominated Flame Retardants (e.g. ABS plastics and foams) are collected, shredded and mixed with other substances to form "recycled" resin with a lower quality.

RECYCLED

DILUTION OF POPs INTO NEW PRODUCTS IS NOT THE SOLUTION TO PROTECT CHILDREN FROM THE POLLUTION OF BROMINATED FLAME RETARDANTS. IT ENSURES BROADER EXPOSURE AND MORE HARM.

"Failure to [stop recycling] will inevitably result in wider human and environmental contamination and the dispersal of brominated diphenyl ethers into matrices from which recovery is not technically or economically feasible and is the loss of the long-term credibility of recycling."

— Stockholm Convention Expert Committee (see Annex to UNEP POPs/PCDD/Fs)

ARNIKA **IPEN**

Mushroom packaging



Courtesy of Ecovative



Fashion

Mushroom leather innovator looks to sprout in Australia

Belad Al-karkhey | AAP
Wed, 1 November 2023 3:03PM



A company producing a leather material from fungi wants to collaborate with Australian designers. (Con Chronis/AAP PHOTOS) Credit: AAP

Designed by Gavin McIntyre and Eben Bayer, the packaging blocks are made with mycelium - the hidden "roots" of the mushroom that usually thread beneath dirt or wood. Used by Dell Computers and others.

National Toxics Network and Zero Waste OZ



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Working globally for a toxic free future

Burning waste for energy It doesn't stack-up

Exposing the push towards unsustainable waste to energy technology in Australia.



August 2013

By Lee Bell and Jane Bremmer
National Toxics Network Inc.



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Working globally for a toxic free future

10 reasons why burning waste for energy is a bad idea

The conversion of waste to energy (WTE) is currently being promoted in Australia as a source of 'green and renewable' energy while reducing the amount of waste that ends up in landfill.

While it does appear attractive to be able to convert solid waste into energy, the reality is that much of the mooted WTE technology involves the incineration of waste, resulting in toxic air emissions and ash residues for a questionable amount of energy production.

WTE technologies can be divided into two categories:

Hot technologies: burn waste and destroy the resource permanently (also known as thermal technologies). This is incineration.

Cool technologies: treat waste while extracting energy without destroying the resource or creating toxic emissions (Includes composting and anaerobic digestion). This is not incineration.

We support the implementation of renewable cool technologies but we do not support the use of hot technologies for waste management.

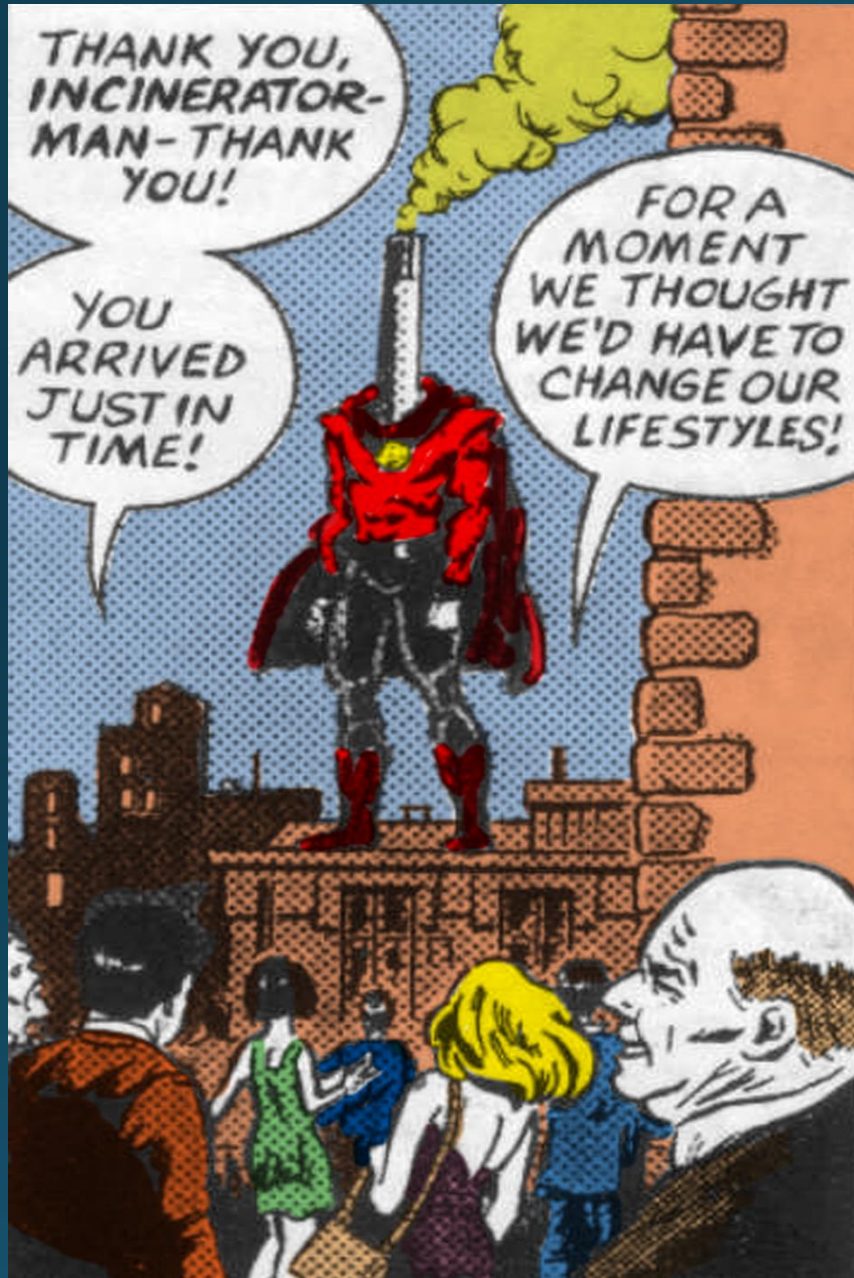
Hot technologies are variously termed *gasification, pyrolysis, plasma arc and combustion*. All of these technologies have been defined as waste incinerators by the USEPA and the European Union.¹

This briefing paper outlines the problems with WTE incineration, or the 'hot technologies' being portrayed as environmentally friendly and a source of 'green renewable energy' and highlights the potential impacts on human health and environment of the use of such technologies.

Why is burning waste a bad idea?

Waste incinerators are a polluting, expensive and unsustainable technology that undermines zero waste strategies (such as recycling and composting) and stifles innovation in the waste management and energy sectors.

Burning resources and creating toxic pollution, whether for energy generation or waste management disposal, makes no sense if we are serious about reducing greenhouse gas emissions and addressing climate change.



Thanks for listening.
Find us at:

www.zerowasteaustralia.org