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Submission to the Legislative Council Economy and Infrastructure Committee,

Parliamentary Inquiry into

The development and expansion of waste-to-energy (WtE) infrastructure in Victoria.

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Waste-to-Energy (WtE) incineration represents one of the most significant and potentially consequential shifts in Victoria's waste management policy in decades. These facilities involve the large-scale thermal treatment of municipal solid waste, plastics, and industrial materials under the premise to generate electricity or fuel products. While often presented as a solution to landfill pressures, WtE facilities are internationally recognised as major industrial pollution sources that generate a complex mixture of emissions and hazardous residues, including toxic air pollutants, greenhouse gases, incinerator bottom ash, and air-pollution-control residues.

Because of these risks, large thermal waste treatment facilities are typically subject to rigorous environmental assessment, transparent planning processes, and comprehensive economic justification before approval. In Victoria, projects with the potential for significant environmental impacts are ordinarily assessed under the Environment Effects Act 1978 (Vic) through the preparation of an Environmental Effects Statement (EES). The EES process is intended to ensure that projects with complex environmental implications undergo independent scientific review, cumulative impact assessment, and meaningful public scrutiny prior to approval.

Facilities such as waste-to-energy incinerators would normally be expected to undergo this level of assessment due to their scale, their emissions profile, and their potential long-term effects on public health, environmental quality, and waste management systems.

However, in all of the cases relating to proposed WtE facilities in Victoria, the Planning Minister has exercised discretion to waive the requirement for an Environmental Effects Statement. The rationale for these decisions is not clearly articulated in the public domain. The absence of an EES removes an important layer of independent environmental scrutiny and prevents full evaluation of cumulative pollution impacts,

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alternative waste management strategies, and long-term environmental risks and one has to ask why this important strategy to protect Environment and Human Health is now being waived.

Equally concerning is the apparent absence of any publicly available economic or feedstock analysis supporting the development of large-scale waste incineration infrastructure in Victoria. Waste-to-energy facilities require substantial and continuous waste streams for decades in order to remain economically viable. Despite this fundamental requirement, there appears to be no transparent business case explaining the projected waste volumes, waste composition, or long-term feedstock sources that would sustain these facilities.

This raises a fundamental policy question that has yet to be answered:

Where will the waste come from?

Without publicly available modelling of future waste streams, it is impossible to determine whether waste-to-energy facilities will:

compete with recycling and resource recovery systems

lock Victoria into long-term waste generation contracts

incentivise the burning of recyclable materials

require the importation of waste from interstate or overseas.

These concerns are particularly significant given that the Victorian Government has simultaneously committed to a circular economy framework designed to reduce waste generation and increase material recovery.

Further uncertainty arises in relation to the Victorian Government's Waste-to-Energy Scheme capacity cap, which has been presented as a safeguard limiting the total amount of waste that can be thermally treated in Victoria to approximately 2.5 million tonnes per year.

However, Victoria currently has approximately eleven waste-to-energy facilities proposed and it appears that four of these facilities already hold existing operating licences and does not seem to be included within the capped licensing scheme. These include:

Maryvale – Paper Australia Pty Ltd

Dandenong South – Great Southern Waste Technologies Pty Ltd

Coolaroo – Visy Industries Australia Pty Ltd

Laverton North – Recovered Energy Laverton Pty Ltd

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If these facilities are excluded from the cap calculations, the true volume of waste scheduled for incineration in Victoria may significantly exceed the publicly stated limit. This creates a critical transparency issue. Communities, policymakers, and stakeholders cannot meaningfully assess the environmental and policy implications of waste-to-energy expansion if the actual incineration capacity is not clearly disclosed and consistently accounted for.

For example : Discrepancy in Total Waste-to-Energy Capacity and Parliamentary Transparency – Hansard February 4th – Victorian Parliament

Questions regarding the true scale of waste-to-energy capacity in Victoria have also been raised in the Victorian Parliament. In Question Time, Rachel Payne MP asked the government to clarify the total amount of waste licensed for incineration when both cap licences and existing operator licences are considered. As she noted:

“The cap on the amount of waste that can be heat-treated to generate energy is currently set at 2.5 million tonnes per annum. The Victorian government website on waste to energy states seven licences have been issued totalling 2.35 million tonnes, but this figure excludes existing operator licences for facilities in Maryvale, Dandenong, Laverton and Coolaroo totalling hundreds of thousands of additional tonnes of waste.”

Ms Payne asked the government directly:

“Can the minister advise what the total amount of waste licence for burning in Victoria actually is?”

This question was clear and direct. It sought confirmation of the total amount of waste licensed for thermal treatment in Victoria, including both the seven licences issued under the Waste-to-Energy Scheme and the existing operator licences.

However, the minister’s response (17TH February 2026) did not provide a clear answer to this question. Instead, the response reiterated the existence of the 2.5 million-tonne cap and referenced licences issued under the Waste-to-Energy Scheme, but did not address the additional tonnage associated with the existing operator licences, nor clarify whether these facilities are included within the cap.

This omission creates significant uncertainty regarding the actual amount of waste that for combustion in Victoria. If existing operators are permitted to operate outside the cap framework, the total amount of waste authorised for burning could be substantially higher than the figure presented to the public.

The lack of a clear response **raises serious governance and transparency concerns.** Communities expect that when a straightforward parliamentary question is asked regarding the total licensed capacity for waste combustion, the answer will provide a clear and comprehensive explanation. Where this does not occur, public confidence is

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inevitably undermined. It leaves the community questioning whether the omission reflects:

a deliberate avoidance of providing the full picture, or

a lack of clarity within government itself about the total licensed capacity for waste-to-energy in Victoria.

Either scenario is concerning. If the full capacity is not being transparently disclosed, the public cannot properly understand the true scale of waste-to-energy infrastructure being permitted across the state. Conversely, if ministers themselves do not have clear oversight of the cumulative licensed capacity, this raises questions about whether the regulatory framework is being adequately managed and scrutinised.

Given the significant environmental, health and policy implications associated with waste combustion, it is essential that the government provide complete transparency regarding the total licensed waste-to-energy capacity in Victoria, including:

the tonnage associated with each licensed facility;

whether existing operator licences are included within the 2.5 million-tonne cap;

whether any applications for expansion of existing licences are under consideration; and the true cumulative capacity of all waste-to-energy and thermal waste treatment facilities operating or proposed in Victoria.

Without this information, the community cannot meaningfully assess the scale, risks, or long-term implications of the state's waste-to-energy policy.

This lack of transparency is **fundamentally inconsistent with the precautionary principle and the General Environmental Duty under section 25 of the Environment Protection Act 2017 (Vic)**, which require that risks of harm to human health and the environment be identified, assessed, and minimised so far as reasonably practicable—a standard that cannot be met where the full scale of waste-to-energy capacity is not clearly disclosed or understood.

So the question still remains; will Victoria be burning 2.35 million tonnes or approximately 4 million tonnes?

In addition to these governance concerns, there are also important questions regarding the monitoring and regulation of emissions produced by waste incineration.

Thermal treatment of mixed municipal waste and plastics generates a complex mixture of pollutants, including:

particulate matter (PM_{2.5} and PM₁₀)

ultrafine particles (PM_{0.1})

nitrogen oxides (NO_x)

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sulphur dioxide (SO₂)
volatile organic compounds (VOCs)
polycyclic aromatic hydrocarbons (PAHs)
heavy metals (including mercury, cadmium, lead, chromium and arsenic)
dioxins and furans (PCDD/F)
brominated dioxins produced from burning brominated plastics
hydrogen chloride (HCl) and hydrogen fluoride (HF)
persistent organic pollutants and emerging contaminants.

While some of these pollutants are included within regulatory monitoring frameworks, others are not routinely measured or continuously monitored. Emerging contaminants such as ultrafine particles, microplastics, brominated flame-retardant by-products, PFAS, and certain persistent organic pollutants are increasingly recognised in scientific literature as potential by-products of waste combustion yet are not consistently included within regulatory monitoring requirements.

This creates a regulatory gap whereby pollutants may be generated but not systematically monitored, raising questions about how **regulators and operators ensure compliance with the General Environmental Duty under the Environment Protection Act 2017 (Vic)**. Under this duty, those conducting activities that pose risks to human health or the environment must identify and minimise risks so far as reasonably practicable, including risks associated with emissions and pollution.

Toxic Emissions from Burning Plastics / MSW (Victoria vs EU BAT Comparison)

Pollutant	Source (Plastic/MSW)	Health Impacts	Bioaccumulative / Persistent	EPA Vic Monitoring	EU BAT Monitoring
Dioxins/Furans (PCDD/F)	Chlorinated plastics (PVC)	Cancer, endocrine disruption	Yes (POPs)	Periodic	Continuous/Periodic
Brominated Dioxins (PBDD/F)	Flame-retarded plastics	Hormonal, developmental toxicity	Yes (POPs)	Not routine	Emerging monitoring
PFAS	Fluorinated plastics	Immune, cancer, reproductive	Yes (forever chemicals)	Not routine	Emerging concern
Heavy Metals (Pb, Cd, Hg)	Additives, pigments	Neurotoxicity, organ damage	Yes	Periodic	Continuous/Periodic
PM2.5 / PM10	Combustion particles	Respiratory, cardiovascular	No (carrier)	Continuous	Continuous
Ultrafine Particles (PM0.1)	High-temp combustion	Deep lung penetration, systemic	No (carrier)	Not monitored	Limited
VOCs (Benzene, Styrene)	Plastic breakdown	Cancer, neurological	Some persistent	Limited	Continuous/Periodic
PAHs	Incomplete	Carcinogenic	Yes	Limited	Continuous/Periodic
NOx	Combustion	Respiratory disease	No	Continuous	Continuous
SO2	Sulphur in plastics	Respiratory irritation	No	Continuous	Continuous
HCl / HF	PVC / fluoropolymers	Acid gas irritation	No	Continuous	Continuous

The development of large-scale waste incineration infrastructure without comprehensive environmental assessment, transparent economic justification, and full disclosure of potential emissions also raises broader policy concerns in relation to the precautionary principle, intergenerational equity, and environmental justice. These principles are embedded within modern environmental governance frameworks and require that where there is scientific uncertainty regarding potentially serious environmental harm, decision-makers should act cautiously and ensure that risks are properly understood before proceeding.

Taken together, ***the waiving of Environmental Effects Statements, the absence of transparent feedstock and economic analysis, uncertainty surrounding the application of the incineration capacity cap, and gaps in emissions monitoring***

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frameworks raise serious questions about the transparency and governance of Victoria's waste-to-energy policy framework.

No waste-to-energy facilities should be approved, as the Victorian Government do not provide a clear and comprehensive account of:

the total planned incineration capacity across all projects – see below

the waste streams intended to supply these facilities

the economic justification underpinning their development

the full range of emissions that may be produced and how they will be monitored

how these developments align with Victoria's stated circular economy and waste reduction objectives.

Without this transparency, communities cannot reasonably determine whether the expansion of waste-to-energy infrastructure represents sound environmental policy or a significant and largely undisclosed increase in the large-scale combustion of waste across the state and ultimately they are the ones who will be paying for the decisions being made.

Absence of Environmental Effects Statements (EES) and Failure to Assess Cumulative and Unregulated Emissions

Given the scale, complexity, and well-documented risks associated with waste-to-energy (WtE) facilities, it is standard practice—both in Victoria and internationally—for such proposals to be subject to a comprehensive Environmental Effects Statement (EES) or equivalent environmental impact assessment.

However, it is understood that the Victorian Planning Minister has determined that certain waste-to-energy facilities do not require an EES. This raises a fundamental question: why are projects of this scale and risk profile not being subjected to the highest level of environmental assessment available under Victorian law?

This is particularly **concerning given the extensive international evidence base documenting adverse impacts associated with waste incineration, including:**

increased risks of cancer, birth defects, and respiratory disease near facilities (Environmental Research, 2023);

persistent and bioaccumulative pollutants such as dioxins, furans, and brominated compounds entering food chains;

generation of toxic ash residues requiring long-term hazardous waste management; and

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ongoing concerns regarding cumulative exposure and environmental injustice.

In this context, **the absence of an EES represents not merely a procedural decision, but a failure to rigorously assess cumulative, long-term, and system-wide risks.**

Critically, without an EES, there is no transparent mechanism to assess:

the cumulative impact of multiple WtE facilities operating across Victoria;
the interaction between existing licensed facilities and new cap-licensed facilities;
the long-term health impacts on surrounding communities; and
the full pollutant profile, including emissions not currently regulated or routinely monitored.

This last point is particularly significant. There **is a growing body of scientific evidence confirming that the thermal treatment of mixed municipal and plastic waste generates a wide spectrum of toxic emissions, many of which are not explicitly addressed in Victorian regulatory frameworks.** These include:

ultrafine particles (UFPs), which can penetrate deep into the lungs and bloodstream;

brominated dioxins and furans (PBDD/F) formed from plastic combustion;

PFAS and fluorinated compound breakdown products;

microplastics and nanoplastics released via flue gas and ash residues;

a wide range of volatile and semi-volatile organic compounds (VOCs and SVOCs); and

polycyclic aromatic hydrocarbons (PAHs) and other products of incomplete combustion.

Many of these **pollutants are persistent, bioaccumulative, and associated with serious health effects, yet they are not comprehensively or continuously monitored under current EPA Victoria requirements, nor are they always subject to explicit emission limit values.**

This raises a critical regulatory question:

If these emissions are known to be generated, why are they not explicitly included in monitoring and compliance frameworks?

And more importantly:

Will these pollutants be formally incorporated into Victorian legislation and licence conditions before facilities are approved and operated?

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In the absence of an EES, there is no clear pathway to:

identify and assess these emissions in a comprehensive and transparent manner;

determine their cumulative impact across multiple facilities; or

ensure that regulatory settings are updated to reflect the current state of scientific knowledge.

The decision **to waive EES requirements** therefore risks locking in a regulatory framework that does not account for known and emerging pollutants, and fails to provide the level of scrutiny expected for infrastructure with potentially irreversible environmental and public health consequences.

At a minimum, projects of this nature should be required to undertake a full Environmental Effects Statement, including:

a comprehensive inventory of all known and emerging emissions;

cumulative impact assessment across all existing and proposed facilities; which includes testing of soil, air and water, from independent organisations, before the commencement of the facility followed up with testing on a regular basis- ie every 3 months (to potentially monitor the severity of the pollutants being discharged from the facility and early detection of contamination and therefore procedures put in place to protect communities and environment.

independent, peer-reviewed health impact assessments (HIA);

alignment with international best practice, including EU Best Available Techniques (BAT) and full-spectrum pollutant monitoring.

Without this level of assessment, **the current approach represents a significant departure from both the precautionary principle and international standards of environmental governance and exposes Victorian communities to risks that have not been fully identified, quantified, or transparently communicated.**

A cap that applies only to selected facilities while excluding existing operators cannot be considered a true limit on waste combustion. Without accounting for all licensed thermal treatment facilities, the government cannot determine the cumulative environmental and health impacts of waste-to-energy infrastructure across Victoria.

Actually there could be **3.5–4 million** tonnes of potential burn capacity in Victoria when all projects are considered and this will truly change the dialogue between government and communities.

Feedstock and Waste Supply Risk

Dependence of Waste-to-Energy Incinerators on Continuous Waste Supply

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Waste-to-energy (WtE) incinerators are capital-intensive infrastructure that require a constant and predictable supply of waste feedstock in order to operate efficiently and remain financially viable. Modern incinerators typically operate continuously and rely on long-term waste supply contracts to ensure sufficient throughput to maintain combustion temperatures, generate electricity or heat, and recover high capital investment costs (C40 Cities, 2024; Zero Waste Europe, 2021). As a result, many facilities are designed around the assumption of stable or increasing waste generation over decades, often with contracts lasting 20–30 years to guarantee minimum waste volumes (GAIA, 2022). This structural requirement creates a fundamental policy conflict: if waste reduction, recycling, and circular-economy strategies succeed, incinerators risk operating below capacity, threatening their financial viability. Evidence from several European countries shows that when domestic waste volumes decline, operators may seek to import waste from other jurisdictions simply to maintain plant utilisation (DCCEEW, 2024; Lowy Institute, 2018).

This reliance on a continuous stream of waste has significant financial implications for governments and communities. Incinerators are among the most expensive waste infrastructure projects, often costing hundreds of millions of dollars to construct, and their economics depend on maintaining high throughput over long periods (C40 Cities, 2024). Where waste volumes decline, municipalities may still be obligated under “put-or-pay” contracts to supply a minimum quantity of waste or face financial penalties (GAIA, 2022). Consequently, incineration systems can inadvertently create a perverse incentive to prioritise burning waste rather than reducing it, undermining recycling targets and circular-economy strategies. Studies of European waste policy have highlighted that regions with large incineration fleets often struggle to expand recycling systems because incinerators must be continually supplied with waste to justify their operating costs (Zero Waste Europe, 2021; C40 Cities, 2024).

Beyond the financial risks, waste incineration also raises persistent environmental and public-health concerns. The combustion of municipal solid waste—particularly plastics and mixed industrial waste—produces a range of hazardous pollutants including particulate matter, nitrogen oxides, sulphur dioxide, acid gases, heavy metals, and persistent organic pollutants such as dioxins and furans (Arnika, IPEN & Toxics Free Australia, 2024; Environmental Research, 2023). Even modern facilities equipped with advanced pollution control systems cannot completely eliminate these emissions, and toxic residues remain concentrated in bottom ash and air-pollution-control residues that require long-term management as hazardous waste (Zero Waste Australia, 2023). Epidemiological studies have linked exposure to incinerator emissions with elevated risks of cancer, respiratory disease, and adverse birth outcomes in communities located near waste incineration facilities (Environmental Research, 2023). Taken together, these findings raise serious questions about the sustainability of an

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infrastructure model that depends on a perpetual stream of waste while simultaneously generating pollutants that may affect environmental and human health.

Ultimately, the requirement for incinerators to continuously consume waste highlights a deeper contradiction in modern waste policy. A truly circular economy seeks to reduce waste generation, maximise recycling, and eliminate harmful pollution, yet incineration systems depend on maintaining large volumes of combustible waste over long timeframes. International experience increasingly demonstrates that this dependency can lock governments into inflexible waste management pathways, creating both financial risk and environmental harm while delaying the transition toward more sustainable waste reduction strategies (C40 Cities, 2024; Zero Waste Europe, 2021; DCCEEW, 2024).

International experience provides clear examples of how the structural dependence of incinerators on continuous waste supply can create unintended consequences. In Sweden, one of the countries with the highest reliance on waste-to-energy incineration, domestic waste volumes have at times been insufficient to supply its large incinerator fleet. As a result, Sweden has imported substantial quantities of waste from neighbouring countries such as the United Kingdom, Norway and Ireland in order to keep facilities operating and maintain district heating systems (Avfall Sverige, 2020; DCCEEW, 2024). This phenomenon reflects a broader pattern in parts of Europe where incineration capacity has expanded faster than waste generation. Several studies have warned that such overcapacity risks locking governments into waste-burning infrastructure that requires a constant feedstock, potentially undermining recycling and waste-reduction policies (Zero Waste Europe, 2021; C40 Cities, 2024). In effect, rather than eliminating waste, incineration systems may create a situation in which waste itself becomes a valuable fuel commodity that must be continuously sourced, sometimes across international borders.

At the same time, global waste markets have already demonstrated how fragile waste supply chains can be. China's 2018 National Sword policy, which banned the import of many types of foreign waste, disrupted recycling systems across the world and forced many countries to confront the limits of waste export as a disposal strategy (Lowy Institute, 2018). This policy shift revealed that international waste flows can change rapidly due to environmental policy decisions, leaving infrastructure dependent on a steady waste supply exposed to sudden shortages or economic instability. When combined with the financial pressures of operating large incinerators, such volatility raises significant concerns that waste-to-energy infrastructure may create long-term economic and environmental liabilities, particularly if waste generation declines due to successful recycling and circular economy policies.

Waste-to-energy facilities require long-term guaranteed waste supply contracts (often 20–30 years) to remain financially viable.

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If Victoria approves multiple facilities, they will collectively require millions of tonnes of waste every year.

This raises several questions:

Where will the waste come from?

Will recyclable materials be diverted to incineration?

Will waste be transported long distances to keep facilities running?

Will Victoria eventually import waste from other states or countries?

International experience shows that incinerators compete with recycling systems for feedstock, undermining circular economy goals.

Why Incinerators are not the solution:

Waste-to-energy incineration is not an effective or sustainable solution for managing municipal solid waste (MSW). Although it is often promoted as a way to reduce landfill volumes and generate electricity, incineration destroys valuable materials that could otherwise be reused, recycled, or composted within a circular economy. Burning mixed waste—particularly plastics made from fossil fuels—produces significant quantities of carbon dioxide and other greenhouse gases, directly contributing to carbon emissions and climate change. This process undermines climate mitigation efforts because materials that could have been recycled or replaced with renewable alternatives are instead permanently lost through combustion. In addition to its climate impacts, the incineration of MSW produces a complex mixture of pollutants including particulate matter, dioxins, furans, heavy metals, and ultrafine particles, many of which are toxic, persistent, and bioaccumulative. Even modern incinerators generate substantial quantities of hazardous residues such as bottom ash and air-pollution-control ash, which contain concentrated heavy metals and persistent organic pollutants. These toxic residues do not disappear through combustion and must be disposed of in specialised landfills, where they can remain in the environment for decades or even centuries, posing ongoing risks to ecosystems, groundwater, and human health.

C40 Cities – Why Solid Waste Incineration Is Not the Answer

Zero Waste Europe

Scottish Government “Stop, Sort, Burn, Bury?” review

Approving large-scale waste combustion infrastructure before clearly demonstrating long-term feedstock availability risks locking Victoria into a waste-dependent system that undermines recycling, waste reduction and circular economy objectives.

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Hazardous Ash and Residue Management

Every incinerator produces toxic ash.

Two main residues:

Incinerator Bottom Ash (IBA)

Incinerator Bottom Ash (IBA) is the solid residue that remains after municipal solid waste has been combusted in a waste-to-energy incinerator. It typically represents approximately 20–30% of the original waste mass and contains a mixture of materials such as metals, glass, ceramics, and partially combusted waste. Importantly, IBA can contain elevated concentrations of heavy metals including lead, cadmium, chromium, copper, and zinc, as well as trace levels of persistent pollutants formed during combustion. Although some jurisdictions process and reuse IBA in construction materials, concerns remain about the potential for contaminants to leach into soil and groundwater, particularly if the material is not properly stabilised or managed (European Commission Joint Research Centre, 2019; Astrup et al., 2015).

Incinerator Bottom Ash Aggregate (IBAA)

Incinerator Bottom Ash Aggregate (IBAA) is produced when IBA is processed through mechanical treatment, including cooling, screening, and metal recovery, to produce a granular material suitable for reuse in civil engineering applications such as road base or construction fill. While these treatments can remove recoverable metals and improve physical stability, the resulting material may still contain residual heavy metals and trace pollutants formed during the incineration process. Studies have shown that under certain environmental conditions, particularly where rainwater infiltrates the material, contaminants may leach from IBAA into surrounding soils or groundwater, raising concerns about its long-term environmental safety when used in open environments (European Commission JRC, 2019; Hjelmar et al., 2013).

Environmental Justice, Human Rights, and the Siting of Waste Incinerators

The siting and operation of waste-to-energy (WtE) incinerators raises profound human rights and environmental justice concerns, particularly where such facilities are disproportionately located in lower socio-economic communities. International human rights law increasingly recognises that access to a clean, healthy, and sustainable environment is a fundamental human right. In 2022, the United Nations General Assembly formally recognised the right to a clean, healthy and sustainable environment (UNGA Resolution 76/300), reinforcing obligations on governments to prevent environmental harm and protect vulnerable populations. This right is closely linked to established protections under the International Covenant on Economic, Social and Cultural Rights (ICESCR), including the right to health (Article 12), which requires states

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to take steps to improve environmental and industrial hygiene and prevent exposure to harmful pollutants (United Nations, 1966).

Against this legal and ethical framework, a substantial body of international evidence demonstrates that waste incinerators are frequently sited in communities already experiencing social disadvantage, cumulative pollution burdens, and reduced capacity to participate in decision-making processes. This pattern raises serious concerns regarding distributive justice and equality before the law. In the United Kingdom, analysis has shown that waste incinerators are three times more likely to be located in the most deprived communities, highlighting a clear and measurable link between socio-economic disadvantage and exposure to pollution-intensive infrastructure (The Guardian, 2020). Similar patterns have been documented internationally, where waste facilities—including incinerators, landfills, and transfer stations—are disproportionately located in industrial zones and lower-income areas, reinforcing what public health authorities increasingly describe as environmental inequality or environmental injustice (UKWIN, 2025; Zero Waste Europe, 2021; GAIA, 2022).

The World Health Organization (WHO) has consistently emphasised that air pollution is one of the leading environmental risks to human health globally, contributing to millions of premature deaths each year (WHO, 2021). WHO Air Quality Guidelines identify particulate matter (PM_{2.5} and PM₁₀), nitrogen dioxide, sulphur dioxide, and ozone as key pollutants, but also acknowledge that complex mixtures of pollutants—including those generated by combustion processes—pose additional and often under-characterised risks. Waste incineration is a known source of such emissions, including dioxins and furans (PCDD/F), heavy metals, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), and ultrafine particles, many of which are toxic, bioaccumulative, and carcinogenic (Environmental Research, 2023; Arnika et al., 2024).

The WHO has made clear that there is no safe level of exposure to many air pollutants, particularly fine and ultrafine particles, which penetrate deep into the lungs and bloodstream and are associated with cardiovascular disease, respiratory illness, cancer, and adverse developmental outcomes.

These health risks are not distributed equally. Communities located near waste incinerators often experience cumulative exposure to multiple pollution sources, including traffic, industry, and legacy contamination, compounding health impacts over time. This is directly relevant to human rights obligations, as the **UN Special Rapporteur on human rights and the environment has emphasised that states must prevent disproportionate environmental harm to vulnerable and marginalised groups and ensure that environmental decision-making processes are transparent, inclusive, and equitable (UNHRC, 2018)**. The disproportionate siting of incinerators in disadvantaged communities therefore raises serious concerns regarding compliance with these obligations.

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In addition to human rights frameworks, several international environmental treaties impose obligations directly relevant to emissions from waste incineration. The Stockholm Convention on Persistent Organic Pollutants requires parties to reduce and, where feasible, eliminate releases of unintentional POPs, including dioxins and furans, which are by-products of waste combustion (Stockholm Convention, Article 5; Annex C). The Convention specifically identifies waste incineration as a key source of these pollutants and mandates the application of Best Available Techniques (BAT) and Best Environmental Practices (BEP) to minimise emissions. Similarly, the Minamata Convention on Mercury obligates parties to control and reduce mercury emissions from industrial sources, including waste incineration, due to mercury's well-documented neurotoxic effects and capacity for long-range environmental transport (Minamata Convention, 2013). These treaties reflect a global consensus that emissions from combustion processes pose significant and ongoing risks to human health and the environment.

Despite these obligations, regulatory frameworks in many jurisdictions do not fully capture the range of pollutants now recognised by contemporary science. Emerging contaminants associated with waste combustion—including per- and polyfluoroalkyl substances (PFAS), brominated dioxins and furans (PBDD/F), ultrafine particles, and airborne microplastics—are not consistently or comprehensively monitored (Arnika et al., 2024; Petrlik et al., 2025). This creates a critical gap between international legal obligations, scientific knowledge, and regulatory practice, particularly where monitoring focuses on a limited subset of pollutants. By contrast, international best-practice frameworks such as the European Union Industrial Emissions Directive (2010/75/EU) and the associated Waste Incineration BAT Reference Document (2019) require extensive pollutant monitoring, continuous emissions measurement, and strict emission limits across a wide range of contaminants (European Commission JRC, 2019). **These frameworks reflect a precautionary approach aligned with human rights principles, recognising that incomplete monitoring undermines the ability to protect public health.**

In this context, the continued siting and operation of waste incinerators in socio-economically disadvantaged communities raises profound ethical and legal concerns. The convergence of disproportionate exposure, incomplete monitoring, and long-term environmental persistence of pollutants suggests that these communities are bearing an unequal share of environmental harm, contrary to the principles of equity, precaution, and the protection of human health embedded in international law. From a human rights perspective, this is not merely a planning issue—it is a question of whether governments are meeting their fundamental obligation to protect **all communities equally from environmental harm** and to uphold the right to a safe and healthy environment.

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The environmental justice concerns identified internationally are also directly relevant to the proposed expansion of waste-to-energy incineration infrastructure in Victoria. The largest proposed or licensed facilities—including those at Wollert, Sunbury, and Maryvale—are all located in areas characterised by rapid urban growth, industrial zoning, and comparatively lower socio-economic profiles, rather than within affluent metropolitan suburbs. For example, the proposed Wollert and Sunbury facilities are located in outer-growth corridors (are 20km apart and due to burn 1.5 million tonnes per year between them) in Melbourne's north and west, areas identified by planning authorities as experiencing rapid population growth, infrastructure deficits, and increasing cumulative environmental pressures. Similarly, the Maryvale facility in the Latrobe Valley is located within a regional industrial area historically associated with heavy industry and economic transition following the decline of coal-based power generation. These siting patterns are consistent with the broader international trend in which waste infrastructure is concentrated in industrial and lower-income communities rather than higher-income suburbs.

By contrast, it is notable that no comparable large-scale waste incineration facilities have been proposed for more affluent areas of Melbourne such as Toorak, Malvern, or Berwick, despite their proximity to major waste-generating populations. This disparity raises important questions about equity and fairness in planning decisions.

Environmental justice frameworks emphasise that all communities—regardless of income, social status, or political influence—should receive equal protection from environmental harm and pollution exposure (United Nations, 2022; WHO, 2021).

The concentration of major waste combustion infrastructure in outer-growth or socio-economically disadvantaged regions risks creating a situation where certain communities bear a disproportionate share of environmental and health risks associated with waste management. Such patterns may give rise to concerns regarding indirect discrimination, particularly where decisions result in unequal environmental burdens on populations with fewer economic resources or reduced capacity to influence regulatory processes.

These concerns are particularly significant in light of Victoria's statutory environmental protection framework. **Under the Environment Protection Act 2017 (Vic), the General Environmental Duty (GED) requires that any person engaging in activities that may give rise to risks of harm to human health or the environment must minimise those risks so far as reasonably practicable (s25). The Act also embeds the precautionary principle (s6), which requires decision-makers to take preventive action where there are threats of serious or irreversible environmental harm, even where scientific certainty is incomplete. When combined with international human rights obligations—including the recognised right to a clean, healthy and sustainable environment—these principles require regulators and planning authorities to**

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ensure that environmental risks are not disproportionately imposed on vulnerable communities.

Where major industrial facilities with known emissions risks are consistently located in socio-economically disadvantaged areas, serious questions arise regarding whether environmental decision-making processes adequately reflect principles of equity, precaution, and non-discrimination. Failure to consider these factors may expose regulatory decisions to scrutiny under administrative law principles and broader human rights frameworks. Ensuring equitable protection from environmental harm is not only a policy objective but also a legal and ethical obligation. In this context, the siting of large-scale incineration infrastructure in Victoria must be carefully examined to ensure that environmental burdens are not unfairly concentrated in communities with the least capacity to bear them, and that regulatory decisions fully comply with both domestic environmental law and international human rights commitments.

Wollert	~740,000 t/yr	Outer-growth corridor	Rapid growth, infrastructure deficits
Sunbury	~760,000 t/yr	Growth suburb	Increasing population, industrial buffer
Maryvale	~650,000-710,000 t/yr	Latrobe Valley	Post-industrial economic transition

The principles of environmental justice, recognised in international law and public health policy, establish that **no group of people should bear a disproportionate share of environmental pollution or environmental harm because of their socio-economic status, ethnicity, or political vulnerability (United Nations Human Rights Council, 2018; United Nations General Assembly, 2022)**. Where major waste incineration facilities are repeatedly located in lower socio-economic communities—while comparable infrastructure is absent from more affluent areas—serious concerns arise regarding equity, cumulative exposure to pollution, and the potential for indirect environmental discrimination. Evidence from the United Kingdom has already demonstrated that waste incinerators are three times more likely to be located in the most deprived communities, highlighting the structural relationship between waste infrastructure siting and socio-economic disadvantage (The Guardian, 2020). Public health authorities, including the World Health Organization, have emphasised that air pollution from combustion sources is a major environmental health risk and that governments have an obligation to protect populations—particularly vulnerable communities—from avoidable exposure to harmful pollutants (WHO, 2021).

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In the context of Victoria's proposed large-scale incineration facilities at Wollert, Sunbury, and Maryvale and the other smaller proposed incinerators, it is therefore essential that regulators carefully consider whether the concentration of pollution-intensive infrastructure in outer-growth or economically transitioning communities is consistent with the precautionary principle and the General Environmental Duty under the Environment Protection Act 2017 (Vic). These statutory obligations require that risks to human health and the environment be minimised so far as reasonably practicable and that preventive action be taken where threats of serious or irreversible harm exist (Environment Protection Act 2017 (Vic), ss6 and 25). When combined with Australia's international commitments recognising the right to a clean, healthy and sustainable environment, these principles require environmental decision-makers to ensure that environmental risks are distributed fairly and that vulnerable communities are not subjected to disproportionate pollution burdens. Failure to adequately consider these environmental justice principles risks undermining public confidence in environmental governance and may expose regulatory decisions to scrutiny under both environmental law and human-rights frameworks (UNGA, 2022; UNHRC, 2018)

Similar concerns have been documented in North London, where the long-running Edmonton incinerator has been the focus of community concern for decades.

Beyond emissions modelling and regulatory assessments, the lived experiences of people residing near operational incinerators provide an important perspective on the social and human impacts of waste-to-energy infrastructure. Across multiple countries, residents living near incinerators have described feelings of frustration, anxiety, stigma, and loss of trust in environmental governance. These accounts illustrate that the impacts of such facilities extend well beyond technical performance standards and into the daily lives of communities.

In the United Kingdom, residents living near the Runcorn Energy-from-Waste incinerator in Cheshire have spoken publicly about their concerns regarding pollution and health risks associated with the facility. In interviews with national media, residents reported ongoing anxiety about emissions from the plant and questioned whether regulatory oversight was sufficiently robust. One resident interviewed by the BBC stated that living near the facility created constant worry about what might be released into the air, explaining that "you just don't know what you're breathing in" and expressing concern about potential impacts on children. Residents living nearby have described feeling that their community has been treated as an appropriate location for infrastructure that would likely face strong resistance elsewhere. In community consultations and media interviews, residents have spoken about concerns over air quality and long-term health impacts. One local resident explained that "we've lived with this facility for years and people still worry about what it's doing to the air we breathe" (BBC News; UKWIN community testimony).

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Community experiences in Teesside, North East England, near the Wilton waste-to-energy facility, further illustrate these concerns. Local residents interviewed following investigations into emissions reporting failures described feelings of anger and mistrust toward operators and regulators. One resident told reporters that the discovery of unreported pollution incidents reinforced fears that communities living near incinerators may not always be fully informed about operational problems, stating that “if they weren’t reporting these incidents, how can we know what’s really happening?” (BBC News investigation into Teesside EfW reporting failures).

Residents in other countries have expressed similar experiences. In Zubieta, Spain, where a major waste-to-energy plant was constructed near the city of San Sebastián, local community groups reported widespread opposition to the project. Residents interviewed during the development of the facility described concerns that their region had been selected for waste infrastructure despite strong community resistance. Community members stated that living near the facility created ongoing anxiety about environmental risks and described the incinerator as “something imposed on the community rather than something the community wanted” (Politico Europe, 2024).

In Baltimore, United States, residents living near the Wheelabrator incinerator have similarly described the psychological and social impacts of living beside a large waste-burning facility. Community members have argued that the plant contributes to existing environmental burdens in neighbourhoods already affected by industrial pollution and economic disadvantage. One local activist described the experience as “living next to a smokestack that burns the region’s waste while our community bears the health risks” (GAIA community reports; environmental justice investigations in Baltimore).

Community testimony collected in documentary reporting and public forums often highlights additional everyday concerns. Residents describe worries about odour, dust, increased truck traffic, noise, and the stigma associated with living near waste infrastructure, alongside persistent uncertainty about long-term health impacts. In a community testimony video documenting experiences of people living near incinerators, residents describe the day-to-day impacts in stark terms, referring to “the smell, the flies, the rats,” and the sense that their neighbourhoods have been treated as suitable locations for infrastructure that other communities would strongly resist **(Community testimony video: Living Near an Incinerator, available at <https://www.youtube.com/watch?v=CogJLlxfx8o>).**

These testimonies are consistent with broader environmental justice research showing that communities located near pollution sources often experience psychological stress, reduced trust in authorities, and a sense of social stigma associated with environmental risk (Bickerstaff & Walker, 2001). The presence of large waste infrastructure can affect how residents perceive their neighbourhoods, influence property values, and shape the long-term identity of communities.

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Taken together, these accounts demonstrate that the impacts of waste incineration facilities cannot be understood solely through technical risk assessments or emissions modelling. They also involve human experiences of uncertainty, fairness, and trust in environmental governance. The voices of residents living near incinerators provide an essential perspective in evaluating the broader implications of waste-to-energy infrastructure and highlight the importance of ensuring that environmental decision-making processes consider not only engineering performance but also community wellbeing, social equity, and environmental justice.

Independent Verification of Emissions: Why Self-Reporting Is a Serious Problem

Independent verification of emissions is essential because, in many cases, the operator is effectively responsible for generating, monitoring, and reporting its own pollution data. This creates an obvious conflict of interest. Where emissions data is primarily self-reported by the facility itself, there is a risk that exceedances may be missed, under-reported, delayed, or not disclosed in a way that gives communities and regulators confidence that the true pollution profile is being captured. This is particularly concerning for waste and incineration facilities, where emissions can include highly toxic pollutants such as dioxins, heavy metals, acid gases, persistent organic pollutants, and ultrafine particles.

The problem is not theoretical. Veolia's Hallam Road, Hampton Park landfill became a clear Victorian example of why independent oversight matters. In that matter, the operator failed to report 22 high methane readings, and the issue proceeded to the Supreme Court, resulting in penalties against Veolia. That case demonstrates the danger of relying too heavily on operator self-reporting, especially where emissions events have serious environmental and public-safety implications. If an operator can fail to disclose repeated elevated methane readings at a landfill, then the same regulatory weakness becomes even more concerning in the context of thermal waste treatment and incineration, where the pollutant profile is more complex and the consequences of under-reporting may be more severe.

Internationally, best practice is moving in the opposite direction. The European Union has increasingly emphasised independent verification, data quality control, and accredited testing. In particular, **Article 9 of EU Implementing Decision 2019/331** has been used as an important benchmark because it requires emissions-related data to be subject to independent verification, rather than relying solely on unverified operator declarations. Likewise, the **Waste Incineration BAT Reference Document (EU BAT/WI BREF, 2019)** sets out rigorous monitoring, quality assurance, and validation expectations, including the use of standardised methods and external quality controls. These frameworks reflect the principle that emissions data must be credible, auditable,

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and independently verified if it is to protect public health and maintain regulatory integrity.

This is reinforced by broader international concern about failures of disclosure in the incineration sector. In the 2025 Zero Waste Europe report, “Revealed: Unreported and Harmful Emissions from Incinerators Across England,” highlighted alleged under-reporting and regulatory failures across England’s waste-incineration sector, including concerns about exceedances and incomplete disclosure of harmful emissions. Also BBC investigation into the Teesside Energy-from-Waste (EfW) incinerator at Wilton International, near Redcar in Northeast England, which reported 913 failures to report pollution incidents to the regulator. Whether through delayed reporting, incomplete pollutant coverage, or over-reliance on operator-generated data, these failures undermine public confidence and demonstrate why self-monitoring alone is inadequate for high-risk facilities.

For that reason, best practice should require at least three things: independent accredited laboratories, ISO/IEC 17025-accredited testing, and real-time public disclosure of emissions data. ISO/IEC 17025 is important because it provides assurance that sampling and laboratory analysis are performed by competent, independent, quality-assured laboratories using validated methods. Real-time public disclosure is equally important because communities should not have to wait for periodic reports or enforcement proceedings to know whether a nearby facility has exceeded safe levels. Together, these measures help address the fundamental weakness of self-reporting by ensuring that emissions data is not merely produced by the operator, but independently checked, publicly visible, and capable of standing up to legal and scientific scrutiny.

In short, where operators monitor and report their own emissions without strong independent verification, the system relies too heavily on trust. For facilities capable of emitting persistent, toxic, and bioaccumulative pollutants, trust is not enough; independent verification must be the minimum standard.

Given the known history of reporting failures, including the Veolia Hallam Road methane case and the international evidence of under-reported incinerator emissions, it is difficult to justify any regulatory model that continues to rely primarily on operator self-reporting. Best practice requires independent accredited verification, ISO 17025 laboratory testing, and real-time public disclosure so that regulators and communities can have confidence that dangerous emissions are being properly identified, measured, and disclosed.

Public Health Evidence and Known Toxic Emissions from Waste Incineration

The public-health case for precaution in relation to waste incineration is not based on a single paper, a single jurisdiction, or a small body of localised evidence. It is based on a substantial and growing international literature, including systematic reviews, epidemiological studies, biomonitoring studies, public-health position statements, and government policy reviews.

Most significantly, **Tait et al. (2020)** conducted a systematic review of 93 peer-reviewed studies on waste incineration and health. **That review found that 61 of the 93 studies (66%) identified significant adverse outcomes associated with waste incineration,** including increased exposure to toxic pollutants, cancer risks, reproductive harm, congenital anomalies, infant death, miscarriage, reduced lung function, hypertension, and other adverse outcomes. The authors concluded that older incinerator technology and infrequent maintenance schedules have been strongly linked with adverse health effects, that the health consequences of newer technologies remain uncertain because of latency and cumulative exposure issues, and that a precautionary approach is required. They also stressed that waste minimisation is essential.

Importantly, Tait et al. also found that dietary ingestion was consistently the dominant exposure pathway for the public, not merely inhalation, meaning that pollutants emitted from incinerators can deposit onto soils, crops, pasture, and local food systems and then enter human bodies through food consumption. This is critical for expert assessment because it means that emissions cannot be evaluated solely through stack concentrations or short-term ambient air modelling. The review further noted that significant findings were reported for dioxins and furans, heavy metals, and polycyclic aromatic hydrocarbons, including in blood, breast milk, hair, urine, and occupational cohorts, demonstrating real-world uptake of combustion-related contaminants by exposed populations.

The more recent systematic review published in **Environmental Research (2023)** **reviewed 61 epidemiological studies worldwide and likewise found evidence linking waste incineration to adverse outcomes including non-Hodgkin lymphoma, soft tissue sarcoma, lung cancer, congenital anomalies, low birth weight, and respiratory disease.** That review identified key pollutant groups associated with incineration exposure, including dioxins/furans (PCDD/F), PCBs, PAHs, heavy metals such as cadmium, lead, chromium and nickel, ultrafine particles, and volatile organic compounds (VOCs). Its overall conclusion was that waste incineration remains associated with adverse health effects and that comprehensive monitoring, health-impact assessment, and precautionary regulation remain necessary.

These findings are consistent with earlier international literature. Porta et al. (2009) undertook a systematic review of epidemiological studies on health effects associated

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with solid-waste management, including incineration, and identified persistent concerns regarding cancers and reproductive outcomes. Earlier landmark reviews such as **Allsopp, Costner and Johnston (2001)** also concluded that incinerator emissions raised significant concerns for human health, especially in relation to dioxins, heavy metals, particulates, and long-term low-dose exposure. While some older studies involve outdated technology, that does not remove their relevance; rather, it demonstrates the historical reality of harm and the need for ongoing caution where persistent pollutants, cumulative exposure, and latency remain unresolved.

The international evidence base is also supported by biomonitoring and food-chain studies. Tait et al. found that residents and workers near incinerators showed elevated concentrations of pollutants including PCDD/Fs, mercury, lead, arsenic, and PAH metabolites, and noted that food grown locally was often a major route of exposure. More recently, **Petrlik et al. (2025)** documented elevated levels of PBDEs, HBCDD, and brominated dioxins/furans (PBDD/Fs) in free-range eggs near waste burning and incineration-related sites, confirming that persistent and brominated combustion by-products can contaminate the food chain. This is particularly important for submissions concerning municipal waste and plastic combustion, because plastics and flame-retardant-containing wastes can generate pollutants beyond the conventional list usually emphasised in standard permit frameworks.

Public-health and professional bodies have reinforced these scientific concerns. The **Public Health Association of Australia (PHAA) Position Statement on Waste Incineration (2024)** warns that incineration emits hazardous pollutants including PM_{2.5}, NO_x, SO_x, VOCs, dioxins/furans, heavy metals, and hazardous ash residues, and links these to respiratory disease, cardiovascular disease, cancer, neurological effects, developmental harm, and broader public-health risks. Similarly, **the Royal College of Physicians and Royal College of Paediatrics and Child Health** in “Every Breath We Take” concluded that combustion-related particulate pollution is associated with heart disease, stroke, respiratory disease, cancer, adverse pregnancy outcomes, and developmental impacts in children. Those findings are directly relevant because waste incinerators are recognised sources of fine and ultrafine particulate pollution, as well as associated toxic co-pollutants.

Government and intergovernmental reviews also support a precautionary approach. **The Scottish Government’s 2022 independent review, Stop, Sort, Burn, Bury?** concluded that incineration is carbon intensive, generates toxic pollutants and hazardous residues, and is increasingly incompatible with circular-economy and net-zero objectives. **The Stockholm Convention** guidance recognises waste incineration as a potential source of persistent organic pollutants, including dioxin-like compounds, and emphasises waste reduction and best available techniques/best environmental practices to minimise releases. Tait et al. specifically noted the relevance of the

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Stockholm Convention and its precautionary framework in the context of waste incineration.

Taken together, these sources show that the health case against complacency is not speculative. It is built on:

a systematic review of 93 studies by Tait et al. (2020), with 61 studies showing significant adverse outcomes

a systematic review of 61 epidemiological studies worldwide in Environmental Research (2023)

earlier systematic and narrative reviews, including Porta et al. (2009) and Allsopp et al. (2001)

biomonitoring studies showing uptake of pollutants in human tissues

food-chain contamination studies such as Petrlik et al. (2025)

public-health authority statements including PHAA (2024) and UK medical bodies

government and international policy reviews such as the Scottish Government (2022) and Stockholm Convention guidance.

The health evidence is also inseparable from the emissions evidence. Thermal treatment of municipal solid waste, plastics, and industrial residues is known to generate a complex mixture of pollutants, including:

particulate matter (PM10 and PM2.5)

ultrafine particles

nitrogen oxides (NO_x)

sulphur dioxide (SO₂)

hydrogen chloride (HCl)

hydrogen fluoride (HF)

carbon monoxide (CO)

volatile organic compounds (VOCs)

semi-volatile organic compounds (SVOCs)

polycyclic aromatic hydrocarbons (PAHs)

heavy metals, including mercury, cadmium, lead, arsenic, chromium and nickel

dioxins and furans (PCDD/F)

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brominated dioxins and furans (PBDD/F) from brominated plastics and flame retardants
PCBs and related persistent organic pollutants
and hazardous solid residues, including incinerator bottom ash and air-pollution-control ash.

For plastic-rich waste streams, the concern is even greater. Plastics are not chemically inert when heated or burned. They are fossil-derived materials often containing additives, stabilisers, pigments, plasticisers, halogenated compounds, and flame retardants. Their combustion or thermal decomposition can therefore generate not only standard combustion pollutants but also halogenated organics, brominated toxicants, PFAS-related breakdown products, microplastics/nanoplastics in residues or emissions pathways, and other emerging contaminants. This is why relying only on a narrow list of conventional pollutants risks materially understating the true hazard profile of waste incineration.

The expert literature does not establish that waste incineration is harmless. To the contrary, it shows **repeated associations with serious adverse outcomes**, identifies real-world human and food-chain exposure, and repeatedly calls for precaution, stronger monitoring, better study design, and more transparent regulation. In those circumstances, it would be unsafe and scientifically indefensible to treat the absence of complete data on newer facilities as proof of safety. As Tait et al. **concluded, there is insufficient evidence to conclude that any incinerator is safe, and a precautionary approach is required.**

Regulatory Implications of the Public Health Evidence

The extensive and consistent body of public-health evidence outlined above has clear and unavoidable regulatory implications. Where credible scientific literature demonstrates the potential for serious harm—including cancer, reproductive impacts, bioaccumulation of persistent pollutants, and long-term environmental contamination—regulatory frameworks must respond in a manner that is precautionary, comprehensive, and evidence-based.

In Victoria, **this obligation is not optional.** It is embedded within the Environment Protection Act 2017 (Vic), which establishes the precautionary principle (s 6), the requirement to have regard to the state of knowledge (s 7), and the General Environmental Duty (GED) (s 25). Together, these provisions require that any person engaging in an activity that may give rise to risks of harm to human health or the environment must identify those risks, assess them, and eliminate or minimise them so far as reasonably practicable.

The public-health evidence on waste incineration clearly establishes that:

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a wide range of hazardous pollutants are known to be generated through thermal treatment of waste;

exposure pathways extend beyond inhalation to include food-chain contamination and long-term environmental deposition;

many pollutants are persistent, bioaccumulative, and associated with delayed or intergenerational health effects; and

there remains scientific uncertainty regarding the long-term impacts of newer technologies, particularly in relation to cumulative exposure and emerging contaminants.

In these circumstances, the application of the precautionary principle requires a high standard of regulatory scrutiny, not a reduced one.

Regulatory Implications

In light of the available evidence, the current regulatory approach in Victoria appears to:

underestimate the scale and complexity of emissions;

exclude known pollutant classes from monitoring frameworks;

fail to assess cumulative impacts across multiple facilities;

rely heavily on operator self-reporting; and

avoid the highest level of environmental assessment (EES).

This is inconsistent with both the legal framework established under the Environment Protection Act 2017 (Vic) and the international scientific evidence base.

The public-health evidence does not support a regulatory approach based on minimal assessment, limited monitoring, or assumptions of safety. Rather, it supports a framework grounded in:

the precautionary principle;

full-spectrum pollutant identification and monitoring;

independent verification of emissions data;

comprehensive cumulative impact assessment

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Apply the Precautionary Principle to All Waste-to-Energy Proposals

Given the documented associations between waste incineration and serious health outcomes—including cancers, reproductive disorders, congenital anomalies, and environmental contamination—the Victorian Government must apply the precautionary principle as required under section 6 of the Environment Protection Act 2017 (Vic). Where credible scientific evidence demonstrates the potential for significant harm, the absence of complete scientific certainty must not be used as a reason to postpone protective regulatory measures.

Accordingly, no waste-to-energy facilities should be approved until comprehensive and transparent health, environmental, and cumulative impact assessments have been undertaken.

Expand Emissions Monitoring to Cover the Full Pollutant Profile

Regulatory frameworks must be updated to require comprehensive monitoring of the full spectrum of pollutants known to be produced by waste combustion, including but not limited to:

particulate matter (PM₁₀, PM_{2.5}, ultrafine particles)

nitrogen oxides (NO_x)

sulphur dioxide (SO₂)

hydrogen chloride (HCl) and hydrogen fluoride (HF)

volatile and semi-volatile organic compounds

polycyclic aromatic hydrocarbons (PAHs)

heavy metals including mercury, cadmium, lead, arsenic, chromium, and nickel

dioxins and furans (PCDD/F)

brominated dioxins and furans (PBDD/F)

persistent organic pollutants (POPs) and emerging contaminants.

Monitoring must be continuous where technically feasible, rather than relying on periodic sampling or proxy measurements.

Where scientific evidence indicates the presence of pollutants associated with waste combustion—including ultrafine particles, brominated compounds, PFAS-related substances, and microplastic residues—these should be incorporated into regulatory monitoring frameworks as a matter of urgency.

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Victoria's regulatory framework should align with these standards.

Mandate Comprehensive Health Impact Assessments

All proposed waste incineration or thermal waste treatment facilities should be required to undertake independent Health Impact Assessments (HIA) prior to approval.

These assessments must examine:

direct and indirect exposure pathways

cumulative environmental contamination

food-chain contamination risks

impacts on vulnerable populations including children, pregnant women, and the elderly

long-term disease latency.

Baseline population health studies and long-term health surveillance programs should also be established in communities surrounding existing and proposed facilities.

Improve Transparency and Community Access to Information

Communities located near existing or proposed waste-to-energy facilities must have access to:

real-time emissions monitoring data

independent environmental monitoring results

transparent reporting of licence conditions and compliance data

independent review mechanisms.

Meaningful public participation and transparency are essential for maintaining trust in environmental governance.

Align Waste Policy with Circular Economy and Waste Reduction Principles

Waste incineration should not undermine efforts to reduce waste generation, increase recycling, and transition toward a circular economy.

Policy settings should prioritise:

waste reduction

reuse and recycling systems

resource recovery

non-combustion waste management strategies.

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Long-term reliance on incineration risks locking Victoria into a waste-dependent system that is inconsistent with climate objectives, circular-economy goals, and sustainable resource management.

Given the scale of uncertainty and the seriousness of potential health impacts identified in the scientific literature, the Victorian Government should adopt a precautionary, evidence-based regulatory framework that prioritises public health protection, environmental integrity, and transparent governance.

Until the full health, environmental, and cumulative impacts of waste-to-energy facilities are properly assessed and addressed, further expansion of thermal waste treatment infrastructure should not proceed.

Recommendation: Do Not Expand Waste Incineration Until Technologies Can Demonstrate Full Emissions Control

The Victorian Government should not promote or expand waste incineration or waste-to-energy facilities as a preferred waste management solution where the underlying technologies are unable to capture, destroy, or safely manage the full spectrum of toxic pollutants generated during thermal treatment of waste.

Although modern facilities often claim to incorporate advanced pollution-control technologies—including scrubbers, baghouse filters, electrostatic precipitators, and catalytic treatment systems—the scientific evidence demonstrates that these technologies cannot eliminate all emissions associated with waste combustion. Air pollution control systems are designed to reduce certain pollutants; however, they cannot fully prevent the formation or release of complex mixtures of hazardous substances, particularly where waste streams contain plastics, brominated flame retardants, heavy metals, and other chemically complex materials.

Even where advanced air pollution control technologies are used, pollutants may still be emitted in trace concentrations, accumulate in the environment, or be transferred to other waste streams such as incinerator bottom ash and air-pollution-control residues. These residues themselves require long-term management and are frequently classified as hazardous waste due to their toxic composition.

Importantly, the scientific literature emphasises that **many health effects** associated with these pollutants arise from **long-term low-dose exposure and cumulative bioaccumulation, particularly through food chains and environmental deposition**. Consequently, the absence of visible emissions or compliance with narrow regulatory limits does not necessarily indicate the absence of risk.

Where technologies are incapable of capturing or monitoring the full spectrum of pollutants generated by waste combustion, **it is inappropriate to promote such facilities as a safe or sustainable waste management solution**.

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Until technologies exist that can demonstrably prevent the formation, release, and long-term environmental accumulation of the full range of hazardous pollutants associated with waste combustion, the continued expansion of waste-to-energy infrastructure represents a significant and unnecessary risk to public health and environmental protection. No combustion technology currently in operation is capable of capturing or neutralising the full spectrum of pollutants generated from the burning of municipal and plastic waste.

Case Studies of Environmental Contamination Near Waste Incinerators

Zubieta Waste-to-Energy Plant – Spain

Source: Politico Europe (2024); European environmental investigations

The Zubieta waste-to-energy facility in the Basque Country has been cited as a case study illustrating the limitations of modern incineration technology. Despite being promoted as a state-of-the-art waste-to-energy facility, local monitoring and investigations identified concerns regarding:

emissions of dioxins, heavy metals and fine particulate matter

generation of hazardous ash residues

long-term environmental contamination risks.

The facility also faced strong community opposition due to concerns that **pollution control technologies could not fully eliminate toxic emissions**. Critics highlighted that even with modern filtration systems, trace releases of persistent pollutants are unavoidable and may accumulate in surrounding ecosystems over time.

Global Evidence of Egg Contamination Near Waste Burning Sites

Petrlik J., Bell L., et al.

Persistent Organic Pollutants in Eggs Near Waste Incineration and Open Burning Sites.

Emerging Contaminants (2025)

A recent international review of contamination around waste burning and incineration facilities found high levels of persistent organic pollutants in eggs from free-range chickens located near waste combustion sites worldwide.

The study reported contamination with:

brominated flame retardants (PBDEs)

hexabromocyclododecane (HBCDD)

brominated dioxins and furans (PBDD/F)

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The study demonstrated that:

pollutants released during combustion, deposit onto soil and vegetation, **contaminants enter the food chain through poultry and livestock and** residents may be exposed through consumption of locally produced food.

This evidence confirms that even where emissions are controlled at the stack, persistent pollutants can escape capture systems and accumulate in agricultural products.

Mantua Industrial Waste Incinerator – Italy

Source: Comba et al., Occupational & Environmental Medicine

Investigations into populations living near an industrial waste incinerator in Mantua **identified a dramatically elevated incidence of soft-tissue sarcoma among nearby residents, with an odds ratio of over 30 for residents living within two kilometres of the facility.**

The case illustrates the long-term consequences of uncontrolled or poorly regulated incinerator emissions, particularly those containing dioxins and related persistent organic pollutants.

Non-Hodgkin Lymphoma Near Incinerators – France

Source: Floret et al., Epidemiology

A population study investigating communities exposed to emissions from a municipal waste incinerator found a significant association between dioxin exposure and non-Hodgkin lymphoma.

The study demonstrated that even relatively low concentrations of dioxins emitted from incineration processes can contribute to increased cancer risk in surrounding populations.

Food-Chain Exposure to Dioxins – Taiwan

Source: Chen et al., Environmental International

Research examining residents living near municipal waste incinerators found that individuals consuming locally grown food products had significantly higher concentrations of dioxins in their blood compared to those who did not consume locally produced food. **This finding confirms that incinerator emissions can enter local food systems and lead to measurable human exposure, even when airborne emissions appear compliant with regulatory limits.**

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Food contamination near **modern** European incinerators, not old facilities.

The following demonstrate food-chain contamination cases showing that modern incinerators operating under **strict European regulation** still contaminate food systems which show that pollution control technologies cannot capture all pollutants.

Dioxin Contamination in Eggs Near Waste Incinerators – Netherlands Actual study:

RIVM (National Institute for Public Health and the Environment, Netherlands).

“Dioxins and PCBs in Eggs from Backyard Chickens.” (2016–2017 national investigation)

A number of investigations in the Netherlands identified elevated concentrations of dioxins and related persistent organic pollutants in eggs produced by free-range chickens located near waste incinerators and industrial combustion facilities.

Dioxins and related compounds released during waste combustion were found to deposit onto surrounding soils and vegetation. Free-range chickens ingest contaminated soil particles while feeding, resulting in bioaccumulation of dioxins in eggs.

These findings led **Dutch authorities** to issue warnings regarding the consumption of eggs produced by backyard **poultry near certain industrial and waste combustion facilities**.

This case demonstrates that even where emissions are within regulatory limits, persistent pollutants can still accumulate in local food systems.

Milk Contamination Near the Ivry Waste Incinerator – France

Cordier S. et al.

Maternal residence near municipal waste incinerators and the risk of birth defects.

Occupational and Environmental Medicine (2010)

Investigations around the Ivry-sur-Seine waste incinerator near Paris, one of Europe’s largest municipal waste incinerators, detected elevated concentrations of dioxins in milk and other agricultural products produced in surrounding areas.

Dioxins emitted from incinerators can settle onto pastureland where they are ingested by grazing animals. These compounds are fat-soluble and highly persistent, allowing them to accumulate in milk and meat products.

These findings highlight that food contamination may occur even where air emissions appear compliant with regulatory standards, because long-term environmental deposition allows pollutants to accumulate gradually within ecosystems.

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The Ivry facility is **a modern** European municipal waste incinerator, yet environmental contamination pathways still occurred through long-term atmospheric deposition.

While the following are not directly due to incineration it does demonstrate how destructive these toxins can be once in the food chain after live stock have either eaten contaminated feed, such as grass or drank water from toxic waterways.

Belgium – The 1999 Dioxin Crisis (Government Food Recall)

Country: Belgium / European Union

Pollutants: Dioxins and PCBs

Government action: National food recalls, livestock destruction, regulatory reform

In 1999, dioxins and PCBs entered the Belgian food supply after contaminated industrial oils were mixed into animal feed fats used in poultry and livestock production.

Consequences: The contamination spread rapidly through the food chain and was detected in:

chicken meat

eggs

pork products

dairy products.

The Belgian government was forced to: recall large quantities of contaminated food
destroy millions of chickens, cull pigs and cattle, suspend farms and food producers
impose export bans, which would seriously impact Australia's well protected export market. This incident resulted in major reforms including:

creation of the European Food Safety Authority (EFSA)

strict EU limits for dioxins in food and animal feed

expanded monitoring of persistent organic pollutants.

Key lesson from this example should show that Dioxins are extremely persistent and bioaccumulative, and once they enter the food chain the impacts can spread across national food systems. This scenario can also apply to livestock ingesting contaminated grass or water.

Ireland – Dioxin Contamination of Pork (2008)

Country: Ireland / EU

Pollutants: Dioxins

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Government action: Nationwide food recall

High levels of dioxins were discovered in pork products after contaminated fuel used in feed-drying processes released dioxins that entered animal feed.

The Irish government ordered: a nationwide recall of all Irish pork products, suspension of pork exports, investigation of feed production systems.

The recall affected pork distributed to more than 20 countries.

Dioxin contamination events can trigger massive economic and food system disruptions, even when the original release is small.

Italy – MONITER Program (Government Monitoring Around Incinerators)

Authority: Emilia-Romagna Regional Government

Location: Northern Italy

Pollutants: Dioxins, heavy metals, particulate pollution

Public concern about health impacts from municipal waste incinerators prompted the regional government to establish the MONITER program, a large-scale monitoring and epidemiological research project.

The MONITER program investigated:

environmental contamination

health impacts

biomonitoring of residents

exposure modelling.

Findings from the program confirmed the need for ongoing monitoring and risk assessment around incinerators, particularly for persistent pollutants.

Government authorities implemented expanded environmental monitoring and public health research programs.

These examples show that governments in multiple jurisdictions have had to intervene when persistent pollutants contaminated the environment or food systems.

Across these cases: contamination involved dioxins or related persistent pollutants, exposure pathways included food chain accumulation,

governments were forced to take emergency action or implement new regulations.

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They demonstrate that the risks associated with persistent combustion pollutants are not hypothetical, but have resulted in major regulatory interventions and public health responses.

International incidents, including the Belgian dioxin crisis, the Irish pork contamination event, and government warnings regarding contaminated eggs in the Netherlands, demonstrate that persistent combustion-related pollutants can enter food chains and trigger large-scale regulatory responses when contamination occurs.

These Case Studies demonstrate several key points relevant to regulatory decision-making:

- **Pollution control technologies reduce emissions but cannot capture all pollutants generated during combustion.**
- **Persistent pollutants such as dioxins, furans, and brominated compounds accumulate in soils and ecosystems over time.**
- **Food-chain exposure may represent the dominant pathway of human exposure, particularly through eggs, milk, and meat products.**
- Even modern incinerators operating *in highly regulated European* jurisdictions have produced measurable environmental contamination.

These findings reinforce the conclusions of systematic reviews which state that the absence of visible emissions or compliance with regulatory limits does not guarantee the absence of environmental or health risk.

International case studies have demonstrated that persistent pollutants released from waste incineration can accumulate in local food systems. Investigations in Europe and other jurisdictions have detected elevated levels of dioxins and related compounds in eggs, milk, and agricultural products produced near waste combustion facilities, confirming that pollution control technologies cannot fully prevent environmental contamination.

Modern incinerators significantly reduce emissions compared with older facilities, but **they still emit hazardous pollutants, some of which are toxic even at very low concentrations and may accumulate in the environment and food chain over time.**

International case studies across multiple countries and regulatory systems, the same pattern emerges **where pollution control systems reduce emissions but cannot eliminate them entirely persistent pollutants accumulate in soil, food chains, and biological tissues long-term health impacts may take years or decades to appear.**

These case studies reinforce the conclusion reached in systematic reviews that modern incineration technologies cannot capture or destroy all pollutants generated during waste combustion.

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Recent Incinerator Issues (2024–2026)

1. United Kingdom – Unreported Incinerator Emissions (2025)

Title: Unreported and Harmful Emissions from Incinerators Across England

Zero Waste Europe & UKWIN (2025). Revealed: Unreported and Harmful Emissions from Incinerators Across England.

The investigation identified multiple waste incinerators across England reporting emissions exceedances or failing to disclose harmful pollutants. The report identified exceedances for:

Nitrogen oxides (NO_x)

Sulphur dioxide (SO₂)

Dust / particulate matter

Hydrogen chloride (HCl)

Hydrogen fluoride (HF)

The report also raised concerns about unreported emissions of dioxins, brominated dioxins, heavy metals and PAHs, highlighting potential regulatory monitoring gaps.

2. United Kingdom – Government Tightening Incinerator Standards (2025)

Government to Crack Down on Waste Incinerators with Stricter Standards for New Builds

UK Department for Environment, Food & Rural Affairs (DEFRA). (2025).

The UK Government announced plans to tighten environmental controls on waste incinerators following increasing concerns about pollution, climate impacts, and public health risks. The policy proposes:

stricter emission limits, enhanced monitoring requirements,

increased transparency of emissions data.

The announcement reflects growing recognition that existing controls may not adequately address all pollutant risks.

3. United Kingdom – Toxic Emissions Concerns Raised by Scientists (2025)

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Incinerator Emissions “Pose Serious Health Risks”, Experts Warn

BBC News (2025).

Scientists and public health experts warned that even modern waste-to-energy facilities emit hazardous pollutants including:

dioxins and furans

heavy metals

ultrafine particles

volatile organic compounds

Experts highlighted the cumulative health impacts of long-term exposure, particularly for communities living near incinerators.

4. England – Councils Warned About Health Risks (2025)

Waste Incinerator Pollution: Councils Warned Over Health Risks

BBC News (2025).

Public health experts warned local governments that waste incineration facilities can expose nearby communities to hazardous air pollutants. Concerns include:

cancer risks

respiratory disease

birth defects

environmental injustice in facility siting.

5. Europe – Growing Political Backlash Against Incineration (2024)

Europe, a Backlash Is Growing Over Incinerating Garbage

Yale Environment 360 (2024).

The article documents increasing opposition to waste incineration across Europe due to:

toxic emissions

climate impacts

hazardous ash generation conflicts with circular economy goals. Several governments are reconsidering or restricting new incinerator developments.

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6. Spain – Policy Shift Away from Incineration (2024–2025)

Madrid Waste Strategy Debate – Valdemingómez Complex

Spanish waste policy discussions and municipal strategy documents.

Madrid has faced continuing debate over the Valdemingómez waste complex, with pressure to:

reduce incineration

increase recycling and waste reduction

address community concerns regarding emissions and health impacts.

- Incinerator pollution remains a contemporary issue
- Regulatory frameworks are still evolving
- Even modern plants face scrutiny over toxic emissions
- Governments are being pressured to tighten monitoring and controls

“Waste-to-energy technologies continue to generate hazardous emissions and regulatory concern despite modern pollution control systems.”

Environmental Research (2023)

Health effects of waste incineration: a systematic review of epidemiological studies.

Findings:

Increased cancer risk near incinerators

birth defects

respiratory disease.

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Scotland – Moratorium on New Waste Incinerators

Scottish Government. (2022). Stop, Sort, Burn, Bury? Independent Review of the Role of Incineration in the Waste Hierarchy.

Outcome of the Review

Following the independent review, the Scottish Government accepted the key recommendations and introduced a national policy change.

■ Moratorium on New Incinerators

In June 2022, the Scottish Government announced a moratorium on new waste incineration capacity.

The policy means:

No new waste incinerators will be approved unless they are already under construction or have planning consent.

Future projects must demonstrate exceptional justification.

■ Capacity Cap Introduced

The government concluded that Scotland already had sufficient incineration capacity.

Therefore: Additional facilities would lock the country into waste burning

This would undermine recycling and waste reduction targets.

■ Waste Reduction and Circular Economy Priority

The review concluded that incineration conflicts with Scotland's circular economy strategy.

The government committed to:

prioritising waste reduction

increasing reuse and recycling

reducing reliance on thermal treatment of waste.

■ Carbon and Climate Concerns

The review found that waste incineration:

produces significant greenhouse gas emissions

conflicts with Scotland's net-zero targets.

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The report highlighted that burning plastics (derived from fossil fuels) generates substantial CO₂ emissions.

■ Public Health and Environmental Concerns

The review recognised ongoing concerns regarding:

air pollution

toxic emissions

public health risks

particularly for communities living near facilities.

The Scottish Government stated that:

“Scotland does not need more incineration capacity and the focus must shift to waste reduction and recycling.”

“The Scottish Government has already recognised the risks associated with expanding waste incineration capacity. Following an independent review, Scotland introduced a national moratorium on new incinerators, concluding that additional **waste-to-energy capacity would undermine recycling, increase carbon emissions and conflict with circular economy objectives.**”

8. Detroit Municipal Waste Incinerator – United States

Closure of the Detroit Waste-to-Energy Facility 2019

City of Detroit / Michigan Department of Environment, Great Lakes and Energy (EGLE) reports.

City of Detroit. (2019). Detroit Renewable Power Incinerator Closure Announcement.

Detroit Free Press, 27 March 2019.

The Detroit incinerator operated for decades and was widely criticised for: air pollution emissions, community health concerns, environmental justice issues affecting nearby residents.

Environmental groups documented emissions of:

particulate matter

nitrogen oxides

heavy metals

dioxins.

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Following years of public pressure and environmental concerns: the government acted and the facility was permanently closed in 2019 and the city shifted toward waste reduction and alternative management strategies.

9. Harrisburg Waste-to-Energy Incinerator – Pennsylvania, United States

Harrisburg Resource Recovery Facility Financial Collapse

City bankruptcy declared 2011; facility restructuring 2013

Pennsylvania Department of Environmental Protection (DEP).

U.S. Securities and Exchange Commission investigations (2013).

U.S. Government Accountability Office (GAO) discussions of municipal waste-to-energy financing failures.

The Harrisburg incinerator project experienced major operational and financial problems, including expensive pollution-control upgrades required by regulators mounting debt exceeding USD \$300 million and repeated operational problems.

The financial burden contributed to Harrisburg declaring bankruptcy in 2011, one of the largest municipal bankruptcies in U.S. history linked to an incinerator project.

10. Sheffield Energy Recovery Facility Proposal – United Kingdom

Sheffield Waste-to-Energy Facility Proposal Cancelled

Project cancelled 2018

Sheffield City Council planning reports (2018).

BBC News. (2018). Sheffield Incinerator Plan Scrapped.

Plans for a new waste-to-energy incinerator in Sheffield were abandoned following strong opposition from residents and environmental groups. Concerns included:

air pollution and public health risks

increased waste burning discouraging recycling

climate impacts.

The project was ultimately cancelled by local authorities.

11. Canberra Waste-to-Energy Incinerator – Australia

ACT Government Rejects Waste-to-Energy Incinerator Proposal

Decision announced 2019–2020

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ACT Government. (2020). Decision on Waste-to-Energy Policy for the Australian Capital Territory.

ABC News. (2020). ACT Government Rules Out Waste-to-Energy Incinerator.

A proposed waste incinerator in the Australian Capital Territory generated strong community concern regarding:

toxic air emissions

potential health impacts

climate implications.

Following policy review, the ACT Government announced that waste-to-energy incineration would not be supported in the Territory.

12. Japan National Incinerator Closures Following Dioxin Crisis

Japan Dioxin Emission Control Measures for Municipal Solid Waste Incinerators

Major reforms introduced 1999–2002

Japanese Ministry of the Environment. (2000). Dioxin Emission Inventory and Reduction Strategy.

Government of Japan. Law Concerning Special Measures Against Dioxins.

In the late 1990s Japan discovered extremely high emissions of dioxins from municipal waste incinerators, particularly small poorly controlled facilities.

Government action included: closure of hundreds of incinerators, introduction of strict emission limits, mandatory pollution-control upgrades, nationwide dioxin monitoring programs.

These reforms dramatically reduced national dioxin emissions.

Several modern incinerators have had emission limit breaches recorded by regulators in Europe between 2023–2025, which provides very recent real-world

Regulatory evidence.

Financial Risks and Public Liability Associated with Waste-to-Energy Incineration

Waste-to-energy (WtE) incineration has repeatedly imposed significant financial burdens on municipalities and communities internationally, with documented cases of long-term debt, stranded assets, and substantial public financial exposure.

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One of the most prominent examples is the Harrisburg Resource Recovery Facility in Pennsylvania, United States, where cost overruns and debt linked to a waste-to-energy incinerator retrofit exceeded USD \$300 million and ultimately forced the City of Harrisburg into bankruptcy in 2011 (United States Bankruptcy Court, 2011). Similarly, the Detroit Renewable Power incinerator required extensive public subsidies—estimated at over USD \$1 billion—over its operational life before being permanently closed in 2019 due to financial and environmental concerns (City of Detroit, 2019; GAIA, 2019).

In the United Kingdom, national audit authorities have identified that local governments entered into long-term Private Finance Initiative (PFI) waste contracts—typically lasting 25 to 30 years—which included “put-or-pay” provisions requiring councils to supply minimum waste volumes or face financial penalties (National Audit Office, 2018). As recycling rates increased and waste volumes declined, these contractual arrangements resulted in councils paying for unused incineration capacity, creating substantial ongoing financial liabilities (Public Accounts Committee, 2021; BBC News, 2018–2024).

Financial instability has also occurred in Europe. The AEB Amsterdam waste-to-energy facility required financial intervention by the City of Amsterdam following operational failures and plant shutdowns in 2019, exposing the municipality to significant unplanned costs (Reuters, 2019). Denmark has similarly been forced to restructure its national incineration sector due to overcapacity and declining waste volumes, with government policy now aimed at reducing reliance on incineration because of its financial and environmental inefficiencies (Danish Government, 2020; Zero Waste Europe, 2023).

These cases demonstrate a consistent economic pattern: waste-to-energy incineration facilities require guaranteed long-term feedstock and high utilisation rates in order to remain financially viable. This is typically secured through contractual arrangements that transfer risk from private operators to the public sector. Where waste volumes decline—as expected under circular-economy and recycling policies—facilities become under-utilised, yet financial obligations remain, resulting in stranded infrastructure and long-term fiscal burdens on councils and ratepayers (National Audit Office, 2018; Zero Waste Europe, 2023).

This risk is directly relevant to Victoria. The SEMAWP (South East Melbourne Advanced Waste Processing) procurement model involves multiple councils entering into long-term waste supply arrangements, effectively replicating the contractual risk structures observed internationally (National Audit Office, 2018). The current delays associated with the VCAT proceedings relating to the proposed Hampton Park Waste Transfer Station further highlight the fragility of this system, where critical feedstock infrastructure remains uncertain. Should waste volumes decline, infrastructure be delayed, or facilities operate below capacity, councils may still be contractually liable,

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exposing ratepayers to significant financial risk. As the contract for SEMAWP remains secret, it is hard to know what is really at stake and what the real risks are for the ratepayers.

In this context, expanding waste-to-energy incineration capacity in Victoria presents not only environmental and public health concerns, but also foreseeable financial risks consistent with international experience. A precautionary policy approach is therefore warranted.

Financial Risk and Infrastructure Uncertainty

The international evidence demonstrates that waste-to-energy infrastructure carries significant financial risks where long-term contractual commitments are made before feedstock supply and supporting infrastructure are fully secured. These risks arise when governments or councils enter into long-term waste supply agreements that require guaranteed waste volumes to sustain facility operations. Where waste volumes decline, recycling policies expand, or infrastructure is delayed, councils may remain contractually obligated to supply waste or make payments regardless of actual need. Such arrangements have resulted in stranded assets, long-term debt, and substantial public financial liabilities in multiple jurisdictions.

In light of these risks, careful consideration should be given to whether committing to long-term waste-to-energy infrastructure aligns with Victoria's circular economy objectives and with the precautionary decision-making principles embedded in the Environment Protection Act 2017 (Vic).

Environmental Justice and the Siting of Incinerators

The siting of waste incinerators and other waste infrastructure in lower-income or politically marginalised communities has been widely documented in environmental justice research. Numerous studies have found that communities with lower socio-economic status are significantly more likely to host polluting infrastructure, including waste incinerators, landfills, and heavy industrial facilities.

In the United Kingdom, a national analysis found that waste incinerators were three times more likely to be located in the most deprived areas than in the least deprived areas (Walker et al., 2003; The Guardian, 2020). Similar patterns have been identified in the United States, where research has shown that communities living near waste incinerators and other pollution sources are more likely to have lower incomes, higher proportions of minority populations, and reduced political influence compared with the wider population (Bullard, 2000; GAIA, 2019).

Environmental justice scholars have described this pattern as “environmental inequality”, where communities with fewer economic and political resources

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disproportionately bear the environmental and health risks associated with industrial development. These communities often experience reduced access to decision-making processes, limited resources to challenge planning decisions, and fewer opportunities to relocate once major infrastructure has been established.

This pattern is increasingly relevant to the Victorian context. Proposed waste-to-energy incinerators in Sunbury and Wollert are located in rapidly expanding outer suburban areas where large numbers of new housing estates are being developed. These communities are still in the process of being established and may have limited capacity to influence large-scale infrastructure planning decisions. The other proposed 9 incinerators will also be located in low socio-economic areas, however they are more established, older areas. The concentration of major thermal waste facilities in such locations raises legitimate questions regarding planning equity, environmental justice, and whether certain communities are being disproportionately asked to bear the environmental risks associated with metropolitan waste management.

International experience suggests that once such infrastructure is established, the impacts can extend beyond environmental concerns. Communities frequently report social stigma, reduced property values, and the perception that their neighbourhoods have been designated as appropriate locations for infrastructure that would face significant opposition if proposed in more affluent areas. This reinforces the importance of ensuring that planning decisions consider not only technical compliance but also broader issues of fairness, equity, and community wellbeing. “Notably, no waste-to-energy incinerators have been proposed in Melbourne’s higher-income inner or bayside suburbs, despite these areas generating significant waste volumes.”

Technology Risk (Gasification / Pyrolysis)

Some proposed waste-processing facilities claim they are not incinerators but instead use technologies such as gasification, pyrolysis, or “advanced thermal treatment.” However, these processes still involve the thermal decomposition of waste at high temperatures, meaning they are fundamentally forms of waste incineration by another name. While proponents often argue that these systems “melt” or chemically break down plastics rather than burn them directly, the underlying process still generates toxic emissions, contaminated residues, and hazardous by-products similar to those produced by conventional incinerators. International experts, including process engineer Dr Andrew Rollinson and organisations such as GAIA (Global Alliance for

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Incinerator Alternatives), have highlighted that many gasification and pyrolysis projects have struggled technically and commercially, with numerous facilities failing to operate as promised or being abandoned after significant financial investment. These technologies therefore present both environmental and financial risks, particularly where they are promoted as cleaner alternatives despite producing comparable pollutants and residual wastes.

Alternatives to Waste Incineration: Circular Economy, Material Substitution and Residual Waste Management

International evidence demonstrates that waste incineration is not a necessary component of a modern waste management system. Increasingly, jurisdictions are transitioning toward circular economy models that prioritise waste reduction, material recovery, and the substitution of problematic materials such as plastics with renewable and biodegradable alternatives.

A central element of these approaches is the separation of organic waste streams. Food and garden organics (FOGO) systems allow biodegradable material to be diverted from landfill and processed through composting, significantly reducing methane emissions and environmental impacts traditionally associated with landfill disposal. Once organic material is removed, the remaining residual waste stream is substantially reduced in volume and stabilised in composition reducing the odour and therefore community complaints.

In this context, modern engineered landfills—operating without organic waste inputs—remain a viable and lower-risk option for managing residual waste. Unlike incineration, landfills do not require guaranteed feedstock volumes or long-term contractual lock-in to remain economically viable. They provide flexibility within the waste system, allowing waste volumes to decline over time as recycling rates improve and material substitution increases. International waste policy frameworks recognise that, when combined with effective organics diversion, residual landfill capacity plays an important role in supporting circular economy transitions.

At the same time, many jurisdictions are actively reducing reliance on plastics and developing bio-based material alternatives to eliminate problematic waste at its source. Hemp-based materials are increasingly being used as sustainable alternatives to petroleum-based plastics in packaging, textiles, and construction products. Hemp is fast-growing, renewable, and biodegradable, and offers significant potential to reduce both plastic waste and fossil fuel dependence.

Similarly, sugarcane bagasse—a by-product of sugar production—is widely used to manufacture compostable food containers and packaging materials that can replace single-use plastics. These materials can be processed within organic waste systems, further supporting circular waste management.

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Innovations in mycelium (mushroom-based) materials provide another promising alternative. Mycelium can be grown using agricultural waste to produce biodegradable packaging that performs similar functions to polystyrene foam but decomposes naturally without leaving harmful residues.

Importantly, many businesses have already begun transitioning toward these alternatives, adopting wooden cutlery, paper-based packaging, compostable cups and plates, and fibre-based materials as substitutes for plastic. These products are specifically designed to break down within composting systems or landfill environments, supporting broader waste-reduction goals. However, where waste is diverted to incineration, the environmental benefits of these materials are effectively lost. Instead of returning safely to the environment or being composted, these materials are destroyed through combustion, undermining the very purpose for which they were developed and discouraging further investment in sustainable alternatives.

In parallel, there is increasing recognition of the need to address plastic consumption at its source. One practical and proven approach is the reintroduction of glass as a primary packaging material, particularly for beverages currently sold in plastic bottles. Glass is inert, recyclable, and does not degrade into microplastics or Nano plastics. Transitioning from plastic to glass packaging would not only reduce plastic waste volumes but also address growing concerns regarding human exposure to microplastics and Nano plastics, which are now being detected in air, water, food, and human tissue.

Policy Alignment and Emerging Contradictions

The transition to a circular economy is predicated on reducing waste generation, increasing recycling, and minimising reliance on disposal technologies. In this context, the continued expansion of waste-to-energy incineration raises important policy questions.

Incineration facilities require a consistent and long-term supply of combustible waste—particularly plastics—to remain economically viable. This creates an inherent tension with policies aimed at reducing waste volumes and phasing out problematic materials. As recycling rates increase, alternative materials are adopted, and businesses invest in biodegradable packaging, the availability of suitable feedstock declines, potentially undermining the economic viability of incineration infrastructure.

At the same time, the role of landfill is evolving. With organic waste increasingly diverted through FOGO systems, the environmental impacts traditionally associated with landfill are significantly reduced. In addition to this, landfills now have to be lined with a plastic membrane and had leachate mitigation, such as drainage pipes and storage facilities, where the leachate will be treated and also gas extraction pipes. (Veolia, Hallam road, Hampton Park). This raises a legitimate question as to whether modern, non-organic

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residual landfills may represent a more flexible and lower-risk option compared to long-term investment in incineration infrastructure.

Within the Victorian context, it is therefore reasonable to question the current policy direction. While circular economy strategies emphasise waste reduction, composting, and material recovery—and while businesses are actively transitioning to biodegradable and non-plastic alternatives—**there appears to be a concurrent push toward establishing long-term waste-to-energy capacity.** This dual approach raises questions about alignment between policy objectives and infrastructure investment, particularly where incineration depends on the continued generation of the very waste streams that policy seeks to eliminate.

A Precautionary Path Forward for Victoria

The evidence presented in this submission demonstrates that waste-to-energy incineration carries significant long-term risks across financial, environmental, and social domains. International experience shows that incineration projects can create substantial financial liabilities for councils and ratepayers, particularly where long-term contracts lock governments into guaranteed waste supply arrangements. These risks are compounded where waste volumes decline or supporting infrastructure is delayed, leading to underutilised facilities and stranded assets.

Environmental and public health concerns remain significant, with **incineration producing a range of toxic emissions and hazardous residues.** At the same time, the siting of such facilities has consistently raised environmental justice concerns, with infrastructure often located in developing or lower-income communities. In Victoria, the concentration of proposed facilities in Sunbury and Wollert and the other 9 proposed incinerator sites, all in low socio-economic areas, alongside strong community opposition, reflects this broader pattern.

Importantly, viable alternatives already exist. Circular economy strategies, organic waste diversion, material substitution, and innovation in biodegradable materials offer pathways to significantly reduce waste without reliance on incineration. Modern engineered landfills, operating without organic waste inputs, provide a flexible and lower-risk option for managing residual waste while these systems continue to evolve.

In light of these factors, it is appropriate to consider whether expanding waste-to-energy incineration aligns with Victoria's long-term environmental, economic, and community objectives. Applying **the precautionary principle and considering the growing body of international evidence, a more cautious and adaptive approach to waste infrastructure planning is warranted.**

Put simply: it is difficult to reconcile a policy that seeks to reduce waste with infrastructure that depends on its continued growth.

A circular economy reduces waste. Incinerators require it.

Both policies cannot succeed at the same time.

If Victoria is serious about transitioning to a circular economy—reducing waste, supporting biodegradable materials, and protecting communities—then it must carefully consider whether locking councils and residents into decades of waste incineration, particularly in rapidly growing outer suburbs such as Sunbury and Wollert, and the other 9 proposed sites, represents responsible environmental, economic, and social policy.

With viable alternatives already emerging—including compostable materials, circular design, organic waste diversion, and modern residual landfills without organics—the continued expansion of waste-to-energy infrastructure risks embedding a costly system that depends on burning waste at the very moment policy claims to be eliminating it.

As businesses invest in biodegradable packaging and governments promote waste reduction, building infrastructure that requires millions of tonnes of waste each year raises a fundamental question: **are we designing a future without waste, or building a system that depends on it?**

This submission raises significant concerns regarding the expansion of waste-to-energy (WtE) incineration in Victoria, with particular reference to financial risk, environmental and health impacts, environmental justice considerations, and the availability of viable alternatives.

International evidence demonstrates that incineration projects frequently impose long-term financial burdens on governments and communities, particularly where contracts require guaranteed waste volumes over decades. These arrangements can result in stranded assets and ongoing liabilities where waste volumes decline due to recycling and circular economy policies.

At the same time, research consistently shows that waste infrastructure, including incinerators, is disproportionately located in lower-income or developing communities. In Victoria, proposed facilities in Sunbury and Wollert, Dandenong South, Lara, Maryvale, Laverton North etx —together representing approximately **4 million tonnes of waste processing capacity**—reflect this pattern and have generated strong community opposition.

Importantly, viable alternatives to incineration already exist. Circular economy strategies, including organic waste diversion, increased recycling, and the adoption of biodegradable materials such as hemp, sugarcane bagasse, and mycelium-based products, provide pathways to significantly reduce waste without reliance on thermal treatment. Businesses are already transitioning to compostable packaging and non-

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plastic materials; however, these efforts risk being undermined where such materials are diverted to incineration rather than allowed to decompose or be recovered.

Modern engineered landfills, operating without organic waste inputs, provide a flexible and lower-risk option for managing residual waste while supporting the transition to a circular economy.

Given the financial risks, environmental impacts, and social implications associated with waste-to-energy infrastructure—and the availability of more sustainable alternatives—this submission calls for a precautionary approach to further incineration development in Victoria.

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