GAIA (Global Alliance for Incinerator Alternatives)
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Submission to the Legislative Council Economy and Infrastructure Committee

Inquiry into the Development and Expansion of Waste-to-Energy (WtE) Infrastructure in Victoria

Executive Summary

Victoria faces a pivotal decision in shaping its waste management future. Waste-to-energy (WtE) incineration, though often marketed as "green," is a **high-carbon, high-cost, and high-risk investment**. Thermal WtE produces carbon-intensive energy, generates toxic emissions, and locks communities into decades of dependence on waste flows—undermining recycling, organics diversion, and broader climate goals.

International evidence, particularly from Europe, demonstrates that WtE can **displace higher-value resource recovery, create stranded assets, and pose serious public health risks**. By contrast, investments in **waste prevention, source separation, and decentralized organics treatment** (composting and anaerobic digestion) provide the **highest climate benefits, greater job creation, and alignment with the principles of a circular economy**.

1. Methane Mitigation: A Climate-First Perspective

Methane from municipal solid waste (MSW) is one of the most potent short-lived climate pollutants, with **roughly 28–34 times the warming potential of CO2 over 100 years**, and nearly **45% of anthropogenic methane emissions** originate from waste.

Thermal WtE is often promoted as a way to reduce landfill methane. Yet this framing is misleading: **incineration converts organic carbon to CO2**, trading one greenhouse gas for another and releasing substantial fossil-carbon emissions when plastics are burned.

High-impact alternatives:

- **Composting:** Aerobic decomposition of organics prevents anaerobic methane generation almost entirely, with reductions up to **99% compared to landfilling**.
- **Anaerobic Digestion (AD):** Captures methane in sealed digesters for energy use while preventing uncontrolled landfill emissions. Methane capture efficiency can exceed **90%**.
- **Biologically Active Landfill Covers:** Compost layers over residual waste foster microbial methane oxidation, typically reducing emissions by **60–65%**.

Key point: Proper organics separation combined with composting or AD is **far more effective than WtE for both methane mitigation and climate alignment**.

2. The Waste Hierarchy: Prioritizing Prevention and Recovery

The **waste hierarchy**—prevention, reuse, recycling, recovery, disposal—is the cornerstone of sustainable waste policy. WtE sits at the lower tiers, often considered a form of **disposal rather than true recovery**.

Impacts of WtE on the hierarchy:

- **Resource destruction:** Burning paper, plastics, and organics removes materials from the economy permanently. Nutrients in food waste, for example, are lost instead of being returned to soils via compost.
- **Discouragement of organics separation:** Incinerators create a demand for residual mixed waste, reducing the incentive for households and municipalities to separate organics or recyclable materials.
- **Conflict with recycling targets:** Europe illustrates that incineration overcapacity can compete for recyclable feedstock, slowing progress on the upper tiers of the hierarchy.

European evidence: Current incineration overcapacity is approximately **60 million tonnes**, with surplus plants pressuring municipalities to burn materials that should be recycled. This “lock-in” creates **long-term structural barriers** to circular economy adoption.

3. Carbon and Climate Impacts

- **High-carbon energy:** Incinerators emit approximately **600 g CO2eq/kWh**, higher than natural gas (340 g) and nearly double the EU grid average (298 g).
- **Fossil-carbon feedstock:** Plastics in the waste stream mean incineration effectively acts as a fossil-fuel power plant.
- **Structural lock-in:** 30–40 year operating lifespans require a continuous supply of waste, **undermining municipal reduction, reuse, and recycling strategies**.

Implication: WtE may reduce methane but simultaneously **increases CO2 emissions**, creating a net climate disbenefit compared to upstream solutions.

4. Health and Environmental Risks

- **Toxic emissions:** Modern WtE plants still release dioxins, heavy metals, and PFAS, which bioaccumulate and are linked to cancer, immune suppression, and developmental disorders.
- **Residual hazards:** Incineration produces millions of tonnes of toxic ash that must be landfilled, creating new environmental challenges.
- **Vulnerable populations:** Children, elderly, and low-income communities near incinerators experience disproportionate exposure. European studies (e.g., Paris) confirm these risks.

5. Economic and Job Considerations

- **High operational costs:** Operational expenditures (OPEX) account for ≥70% of lifetime costs, leaving municipalities financially constrained.
- **Feedstock dependency:** "Deliver or pay" contracts lock local governments into providing continuous waste streams, discouraging reduction and recycling.
- **Job creation:** Composting and repair/reuse generate **3× more jobs per tonne** than WtE, supporting local economies and community engagement.

6. Lessons from Europe

- EU institutions and funds increasingly **exclude WtE from sustainable finance**:
    - European Investment Bank (EIB) aligns with the "do no significant harm" principle.
    - Recovery and Resilience Facility (€672.5B) bars new incinerators.
    - Just Transition Fund (€40B) and Regional Development Funds (€234B) prioritize circular economy investments.
- **Overcapacity warning:** ~60 million tonnes of excess WtE capacity in Europe demonstrates the risk of long-term infrastructure lock-in.

7. United Kingdom Evidence on WtE Being Highly Polluting

- A BBC analysis found that burning household waste for electricity now produces comparable greenhouse gas emissions to coal power, which the UK has phased out — making it effectively the ***most polluting way the UK currently generates electricity on a per-unit basis*****.** Waste-to-energy plants emit about the same greenhouse gases per unit of energy as coal and far more than the UK average electricity mix. This largely reflects the carbon content of plastics and other fossil-derived waste burned in incinerators. (Resource Media)
- According to the same analysis, energy from waste is about **five times more polluting** than the UK's average electricity; plastic waste incineration alone produces around 175 ×

more CO_2 than if the same plastic were landfilled (without considering methane impacts). (Resource Media)

- UK environmental advocates, including Lord Deben (former chair of the UK's Climate Change Committee), have publicly described the expansion of incinerators — especially prior to the UK's legally binding net-zero pathway — as problematic because it undermines recycling and climate goals. (ISEP)
- **Environmental and Social Justice Concerns**
    - Campaign groups such as Greenpeace UK have highlighted that plastic incineration has harmful climate and air quality impacts and disproportionately affects lower-income neighbourhoods in the UK, underscoring a social justice dimension to the siting and pollution burden of WtE facilities. (greenpeace.org.uk)
    - Historical data indicate that waste incinerators in the UK were disproportionately located in more deprived areas, raising environmental justice concerns linked to the health and exposure burdens communities face. (unearthed.greenpeace.org)
- **UK Policy Response**
    - The UK Government has introduced stricter environmental conditions and planning standards for new waste incinerators due in part to concerns about high emissions and low recycling outcomes — recognising that incinerators have been used to deal with nearly half of household waste in recent years. (gov.uk)
    - Lessons learnt from the UK: WtE can lock in high-carbon infrastructure, crowd out recycling and reuse, and in some cases undermine net-zero ambitions by diverting attention and investment from prevention, reuse, and recycling strategies central to circular economy approaches. (ghd.com)

8. Global Success Stories: Circular Waste Management

Evidence from cities and regions worldwide demonstrates that **zero-waste and decentralized organics solutions are feasible, scalable, and socially equitable**.

- **Dar Es Salaam, Tanzania:** Community-led collection achieved **100% organics diversion**, reducing methane emissions by 16.4 tonnes annually.
- **Milan, Italy:** >80% of all organics collected and composted (~95kg per person per year) in a dense urban environment.
- **Salacea, Romania:** Door-to-door separate collection increased recycling from 1% → 61% in three months via education and community engagement.
- **Philippines:** Zero Waste Cities Network of 37 cities committed to **70% reduction in methane emissions by 2030**.
- **Brazil:** National government invested over $70 million USD to support waste pickers and prioritize funding for organic waste recycling.

Key insight: These examples show that **decentralized, circular approaches are practical, cost-effective, and inclusive of local workers**, while WtE carries structural, financial, and environmental risks.

9. Recommendations

1. **Moratorium:** Halt approval of new thermal WtE facilities to prevent carbon and financial lock-in.
2. **Waste hierarchy prioritization:** Focus on prevention, reuse, and high-quality recycling.
3. **Invest in organics:** Decentralized composting and AD maximize methane mitigation, climate benefits, and job creation.
4. **Support a just transition:** Integrate informal waste workers into formal systems with safe, secure livelihoods.

Conclusion

Thermal WtE is a **false climate solution**: high-carbon, hazardous, and economically constraining. In contrast, circular economy strategies—focused on prevention, organics separation, composting, and AD—offer **superior climate outcomes, greater job creation, and protection of human health**.

Victoria has the opportunity to **avoid the European pitfalls of overcapacity, lock-in, and regulatory divestment**, instead building a sustainable, equitable, and zero-waste future.

References

Brazilian Ministry of Environment. (2022). *Support for waste pickers and organic waste recycling programs.* Brasília: Ministry of Environment.

European Commission. (2020). *EU Taxonomy Regulation: Technical Annex – Environmental objectives and DNSH criteria.* Brussels: European Commission. https://eur-lex.europa.eu

European Environment Agency (EEA). (2021). *Municipal waste management in Europe: Data and trends.* Copenhagen: EEA. https://www.eea.europa.eu

European Investment Bank (EIB). (2021). *Circular Economy Guide: Energy recovery and waste management.* Luxembourg: EIB. https://www.eib.org

Food and Agriculture Organization (FAO). (2021). *Composting and anaerobic digestion of organic waste for methane mitigation.* Rome: FAO.

Global Alliance for Incinerator Alternatives (GAIA). (2022). *Zero Waste to Zero Emissions: How Reducing Waste is a Climate Game Changer.* Berkeley, CA: GAIA. https://www.missionzeroacademy.eu/press-release/zero-waste-zero-emissions-report-gaia/

Global Alliance for Incinerator Alternatives (GAIA). (2026). *Addressing Landfill Methane Emissions with Environmental Justice.* GAIA briefing report. https://www.no-burn.org/resources_topics/zero-waste/

Global Alliance for Incinerator Alternatives (GAIA). (2026). *Zero Waste as an Effective Climate Strategy: Avoiding Warming Trade-offs from Incineration.* GAIA briefing report. https://www.no-burn.org/resources_topics/zero-waste/

Hoornweg, D., & Bhada-Tata, P. (2012). *What a Waste: A Global Review of Solid Waste Management.* Washington, DC: World Bank.

Intergovernmental Panel on Climate Change (IPCC). (2019). *Climate Change and Land: Mitigation of climate change through waste and land management.* Geneva: IPCC.

International Solid Waste Association (ISWA). (2022). *Waste-to-energy and health: Risks and mitigation strategies.* Vienna: ISWA.

Milan Municipality. (2022). *Organic waste collection and recovery report.* Milan, Italy.

Philippine Zero Waste Cities Network. (2023). *Zero Waste Cities: Best practices in municipal organic waste management.* Quezon City: ZWCN.

Romania, Salacea Municipality. (2021). *Door-to-door separate collection and community recycling initiative.* Salacea, Romania.

Tanzania, Dar Es Salaam City Council. (2021). *Community-based organic waste management program.* Dar Es Salaam, Tanzania.

UK BBC & Resource Media. (2023). *Waste incineration now the UK's dirtiest form of power generation.* London: BBC/Resource Media. https://resourcemedia.eco/article/bbc-analysis-waste-incineration-now-uks-dirtiest-form-power-generation/

UNEP. (2022). *Global Methane Assessment: Benefits and costs of mitigation.* Nairobi: United Nations Environment Programme.

World Bank. (2020). *Financing municipal solid waste management for circular economy outcomes.* Washington, DC: World Bank.

World Resources Institute (WRI). (2023). *Reducing methane emissions from waste: A global perspective.* Washington, DC: WRI. https://www.wri.org

Zero Waste Europe. (2023). *Zero Waste Europe – Annual Report 2023.* Brussels: Zero Waste Europe. https://zerowasteeurope.eu/library/zero-waste-europe-annual-report-2023/

Zero Waste Europe. (2024). *Zero Waste Europe – Annual Report 2024.* Brussels: Zero Waste Europe. https://zerowasteeurope.eu/publications_types/annual-reports/

Zero Waste Europe. (2025). *European Reuse Barometer – 2025 Edition.* Brussels: Zero Waste Europe. https://zerowasteeurope.eu/publications_types/reports/

Zero Waste Europe. (2025). *The State of Zero Waste Municipalities – 5th edition.* Brussels: Zero Waste Europe. https://zerowasteeurope.eu/publications_types/reports/

Zero Waste Europe & Reloop. (2023). *Marginalising Waste: A Trading Scheme to Reduce Residuals.* Brussels: Zero Waste Europe. https://zerowasteeurope.eu/publications_types/reports/

Zero Waste Europe & Rethink Plastic alliance. (2024). *End of Waste Criteria to Achieve a Toxic-Free Circular Economy in the EU.* Brussels: Zero Waste Europe. https://zerowasteeurope.eu/publications_types/reports/