

ISWA's Position on Waste Incineration with Energy Recovery

Introduction

The International Solid Waste Association (ISWA) has a mission to globally promote and develop sustainable and professional waste management and the transition to a circular economy. As such, ISWA serves as a global advocate and knowledge hub for sustainable practices to guide and support governments, NGOs and private sector actors in implementing sustainable and effective waste management strategies in their area of responsibility.

ISWA is a global organization representing the entire waste management sector. We serve the sector by providing scientific and practical, evidence-based information to support waste management stakeholders to analyse their own needs and make well-founded decisions related to sustainable waste management and circular economy practices. This foundation is critical for establishing practices that are not only effective, but also adaptable, affordable and sustainable in a variety of environmental, social, and economic contexts.

In this position paper, ISWA presents its position on waste incineration with energy recovery in an integrated sustainable waste management system based on the principles of the waste hierarchy and driven by the urgent need for a transition to a circular economy.

The Waste Hierarchy

ISWA is committed to sustainable waste management as expressed by the waste management hierarchy, a conceptual framework that prioritises waste management practices from prevention to disposal.

This hierarchy serves as a guiding policy principle to manage waste in ways that extract the highest possible value. The hierarchy emphasises waste prevention first, followed by reduction, reuse, and recycling. Only when these options have been exhausted, other recovery, including waste incineration with energy recovery, followed by safe disposal methods, such as sanitary and engineered landfills as well as waste incineration without energy recovery, is considered. This structured prioritisation is critical to minimising environmental impact and risk, conserving resources and optimising the value of recovered materials and energy.

However, it is important to recognise that all waste management processes, including recycling, are sources of pollution and yield residues of some kind. All sustainable waste management requires monitoring and a variety of pollution control measures to minimise the negative impact on the environment.



The Role of Waste Incineration in an Integrated Waste Management System

Adhering to the principles of the waste hierarchy and the urgent need for a transition to a circular economy, ISWA recognises waste incineration with energy recovery as an important part of the basket of transitional solutions for managing residual and other non-recyclable waste.

Waste incineration is an effective and proven waste treatment method that focuses primarily on stabilising, sanitising and reducing the volume of waste that cannot be recycled, with energy recovery being a secondary benefit. Carbon mitigation measures can be applied to waste incineration facilities utilizing proven carbon capture technologies. Bottom ash, the non-combustible residue from waste incineration, can be repurposed if environmental and quality criteria are met. Specifically, in densely settled urban areas, where land for waste disposal is often limited, waste incineration offers specific benefits, including reduced land requirements, decreased risk of water pollution, reduced transportation costs and more efficient waste logistics.

Waste Incineration is not Open Burning.

ISWA stresses that waste incineration, as opposed to open burning, operates within strict regulatory frameworks that minimise emissions and ensure public health and safety.

Incineration refers to the controlled process of combustion of waste at temperatures ranging from 750 °C to 1100 °C within a facility that specifically has been built for this purpose with regulated emissions and air pollution control equipment. ISWA also promotes rigorous environmental impact assessments for incineration technologies to better understand and mitigate potential environmental impacts. This commitment ensures that waste incineration serves as a responsible component of an integrated waste management system. Thus, when used responsibly, waste incineration offers a compact, effective, and safe approach to the treatment of residual and other non-recyclable waste.

To ensure the environmental safety of waste incineration, ISWA emphasises the need for stringent air pollution control measures enforced through strict regulations and permitting systems. Controlled waste incineration, conducted with strict monitoring systems and advanced pollution control technologies, minimises emissions and protects public health. Applying the best available technology and practice for emissions treatment in waste incineration will also act as a method to detoxify and remove hazardous waste and residues. There will still be residual fly ash, a hazardous residue that requires careful handling and disposal to avoid environmental contamination.

In the EU, stringent air pollution measures for waste incineration are outlined in the Industrial Emissions Directive (Directive 2010/75/EU), which sets limits on pollutants emitted from waste incineration plants, including dust, gaseous and vaporous organic substances, hydrogen chloride and fluoride, sulphur and nitrogen oxides, heavy metals, dioxins and furans, and carbon monoxide, to protect public health and the environment.



The Need for Context-Specific Waste Management Systems

ISWA recognises that sustainable waste management and the transition to a circular economy cannot be achieved with a “one size fits all” solution. Local and regional variations in waste composition, political and regulatory environments, financial constraints, and technical capabilities necessitate a basket of solutions that reflect the unique needs of communities worldwide.

To ensure that sustainable waste management solutions are effective, affordable, robust and adaptable over time, they must be designed and implemented in an integrated and systemic way, considering the political, social, regulatory, and financial context of each community.

Specifically for waste incineration, there are several guides for decision-makers, including the ISWA White Book on Energy-from-Waste Technologies, which can help make informed decisions on when and how to introduce the technology in a waste management system. For instance, it is encouraged that before any detailed feasibility work or project is commissioned, certain essential pre-conditions must be met. These include the existence of a mature, well-functioning waste management system with high collection coverage and authorities having the necessary capacity and resources to license and permit facilities of the plants accordingly and effectively control, monitor, and enforce their operational standards. Additionally, the waste-inputs average lower calorific value should consistently amount to at least 7 MJ/kg, never falling below 6 MJ/kg in any season. Finally, the community must be both able and willing to bear the increased costs associated with advanced treatment methods.

Conclusion

ISWA, adhering to the waste hierarchy principles and the urgent need for a transition to a circular economy, recognises waste incineration with energy recovery as an important part of the basket of transitional solutions for managing residual and other non-recyclable waste. Waste incineration is an effective and proven waste treatment method that focuses primarily on stabilising and reducing the volume of waste that cannot be recycled, with energy recovery being a secondary benefit.

ISWA stresses that waste incineration, as opposed to open burning, operates within strict regulatory frameworks that minimise emissions and ensure public health and safety. Thus, when used responsibly, waste incineration offers a compact, effective, and safe approach to treat residual and non-recyclable waste.

ISWA advocates for a globally standardised glossary to ensure a shared understanding of terms and concepts. Distinguishing between waste incineration and open burning of waste is essential for accurate regulatory enforcement, responsible waste management practices, and clear public communication.

ISWA recognises that sustainable waste management and the transition to a circular economy cannot be achieved with a “one size fits all” solution.



Sustainable waste management solutions must be designed and implemented in an integrated and systemic way, considering the political, social, regulatory, and financial context of each community. Specifically for the introduction of waste incineration, ISWA stresses the need for the existence of a well-functioning waste management system with high collection coverage, authorities with the necessary capacity and resources to license and permit facilities and effectively control, monitor, and enforce their operational standards and communities both able and willing to bear the cost associated with the treatment method.

Based on this position, ISWA commits to:

- Disseminate knowledge and best practice on the role of controlled waste incineration within the waste management hierarchy, emphasising its benefits in reducing waste volumes and recovering energy.
- Collaborate with international agencies, governments and industry to harmonise environmental safeguards across waste management practices, strengthen regulatory enforcement and support advanced pollution control technologies to ensure safe and sustainable incineration practices where applicable.
- Support ongoing research, development and innovation in waste incineration technologies to improve efficiency, minimise emissions and enhance resource recovery, contributing to the overall sustainability of waste management systems.
- Raise awareness of the benefits and challenges of waste incineration, facilitating discussions on its role within an integrated waste management system and providing resources for informed decision-making at all levels.

