Reducing waste management's contribution to climate change

From post-landfilling methane capture to pre-landfill methane prevention

Study

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ZERO WASTE EUROPE

Executive Summary

Global waste management is fraught with challenges, particularly concerning methane emissions from landfills. In 2020, over 2.1 billion tonnes of municipal solid waste (MSW) were generated, with 62% managed at controlled facilities, and nearly half of this landfilled. With 2.7 billion people lacking waste collection services, the remaining 38% was handled in an uncontrolled manner. Methane, a potent short-term greenhouse gas, is a significant byproduct of landfilling biodegradable waste, contributing substantially to global warming.

Traditional strategies focus on capturing landfill gas to reduce methane emissions, but capture rates of methane generated over time are often low, especially during the initial waste decomposition stages. Recent investigations indicate landfills may be releasing more methane than models have suggested in the past, highlighting the need for improved emission reduction strategies.

An alternative approach involves biologically treating waste before landfilling to minimise methane generation. Biostabilisation techniques (using an approach similar to composting) can significantly reduce the potential for methane production, rendering gas capture systems unnecessary. Mechanical Recovery and Biological Treatment (MRBT) further enhances this by extracting additional recyclables from leftover mixed waste (LMW), thereby reducing the climate impact of both landfilling and incineration.

MRBT systems offer a promising solution for waste management, aligning more closely with circular economy principles and mitigating short-term methane emissions. This approach minimises the global temperature impact of residual waste management and reduces the likelihood of methane emissions reaching critical levels.

In conclusion, shifting the focus from gas capture to biostabilisation of waste prior to landfilling provides a highly effective and sustainable strategy for managing waste and addressing climate change. It avoids emitting fossil-derived CO_2, as happens in the case of thermal treatments, such as incineration. Hence, this method not only reduces emissions but, where additional sorting of LMW is included, also supports a transition towards a more circular and resilient economy.

Zero Waste Europe (ZWE) is the European network of communities, local leaders, experts, and change agents working towards a better use of resources and the elimination of waste in our society. We advocate for sustainable systems; for the redesign of our relationship with resources; and for a global shift towards environmental justice, accelerating a just transition towards zero waste for the benefit of people and the planet. www.zerowasteeurope.eu

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Authors: Dominic Hogg
Editors: Janek Vahk, Shlomo Dowen, Enzo Favoino, Nanna Bille Cornelsen
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General information: hello@zerowasteeurope.eu
Media: news@zerowasteeurope.eu
Cities-related topics: cities@zerowasteeurope.eu

zerowasteeurope.eu
www.zerowastecities.eu
www.missionzeroacademy.eu