

Incineration of Municipal Solid Waste

Impact on Global Warming

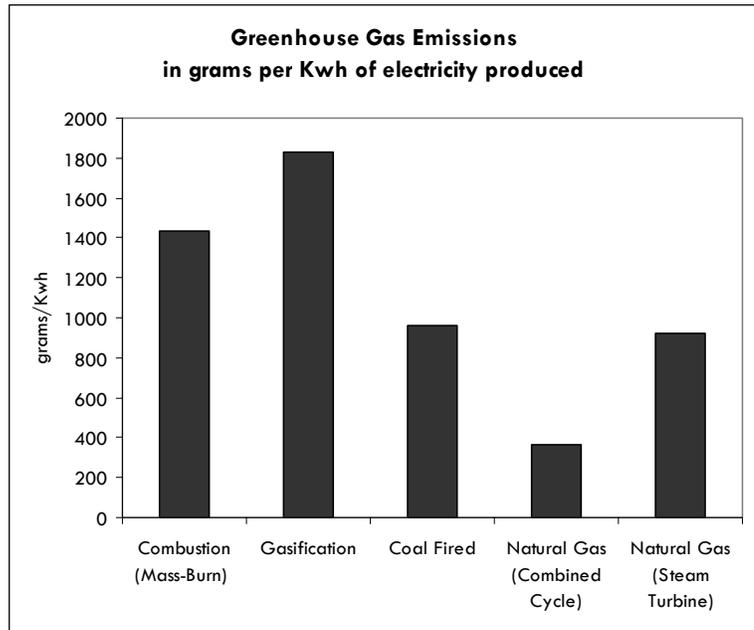
Fact Sheet 1

Municipalities across North America are struggling with complex decisions around long term waste disposal planning. Decades of experience with various disposal options offers a sound set of data from which to measure their environmental impacts. Traditional landfilling for example, releases methane gas which has a significant impact on climate change. Recently, incineration of municipal solid waste has been receiving a lot of attention, with new and improved technologies with claims of a significantly reduced pollution profile.

This fact sheet aims to clarify questions relating to traditional and newer disposal methods for municipal solid waste and their impact on climate change in terms of the release of greenhouse gases (GHGs).

How does incineration as an electricity producer rate against other sources of electricity in terms of their impact on climate change?

When we compare energy producing technologies used in Ontario, incineration contributes the greatest amount of greenhouse gas emissions (see chart on right¹). Compared to coal fired technology, combustion or “mass-burn” technology contributes about 33% more GHGs, and gasification emits 90% more GHG emissions per kwh of electricity produced. This is especially relevant in the context of Ontario’s energy policy. In 2005, the Provincial government announced an aggressive plan to replace coal-fired generation with cleaner sources of energy and conservation. The Minister of Energy at the time stated,



“We are leading the way as the first jurisdiction in North America to put the environment and health of our citizens first by saying ‘no’ to coal...It’s a prudent and responsible path that will ensure cleaner air for the province.”

Doesn’t the electricity from incineration mean avoiding having to use electricity from another sources like coal, which results in an overall greater reduction in greenhouse gas emissions?

This may be accurate in many countries, but in Ontario, very little of our electricity is generated using high greenhouse gas emission technologies like coal or oil fired generation. More specifically, today only 21% of our electricity production is dirty production in terms of GHGs.

By 2025, this amount will be reduced to 14%, and it is anticipated that even these remaining producers will be using cleaner burning technologies.

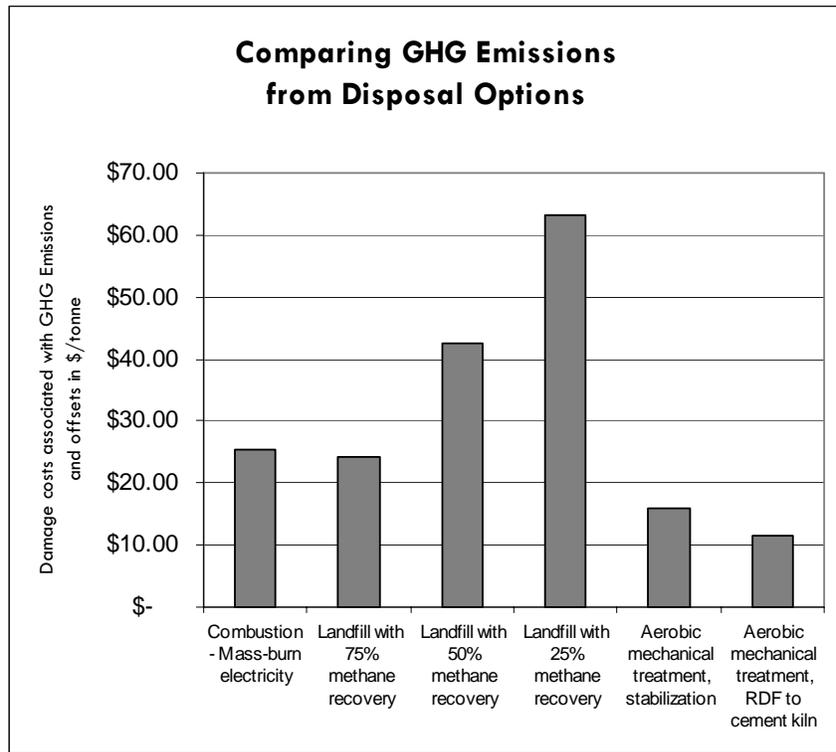
Isn't incineration the most climate friendly method of waste management?

Reduction, reuse and recycling of materials have the smallest impact on climate change compared to any form of disposal. Recycling actually avoids the release of greenhouse gas emissions, because using recycled feedstock as a raw material to manufacture new goods avoids the use of a lot of energy and related emissions associated with raw material extraction processes. (See chart at right²)

Material	Avoided GHGs from recycling (eCO2/tonne)	Net GHGs from Incineration (eCO2/tonne)
Newsprint	(0.30)	(0.05)
Fine Paper	(0.36)	(0.04)
Cardboard	(0.21)	(0.04)
Other Paper	(0.25)	(0.04)
HDPE	(2.27)	2.85
PET	(3.63)	2.13
Other Plastic	(1.80)	2.63

Isn't incineration the most climate friendly method of disposal?

Comparisons³ of disposal options in terms of their contribution to climate change generally includes an “offset” which assumes that for every kwh of electricity generated from that option, a kwh of electricity from traditional sources (like coal or natural gas) is not required. The results show that traditional landfill with a 75% methane recovery rate has a similar impact to traditional incineration that produces electricity. In terms of energy efficiency, an electricity-only thermal plant is also about 60% less efficient than a thermal plant generating heat in terms of energy output.



Newer, non-thermal technologies have a smaller impact on climate change, which include up-front material extraction, followed by a stabilized landfill.

What is a 'stabilized' landfill?

The stabilized landfill provides initial screening of waste to be landfilled to remove materials that should not be landfilled like recyclables, compostables, household special wastes, electronics etc. This significantly reduces quantity requiring landfill disposal. With a cleaner stream of waste going to landfill, vector problems like vermin and birds are reduced, along with methane gas and



leachate. The waste is then composted through anaerobic digestion and its biogas is recovered and used for energy.

In summary

As we move forward and plan for the next 20 years, reducing our impact on climate change is the essential. Irrespective of how you analyze the data, we know that incineration technologies are bad for climate change. We must focus our efforts and spending on improving diversion and maximizing recycling of those materials that required significant amounts of energy to be produced in the first place. By recycling these materials instead of burning them, we can maximize our efforts to conserve energy and reduce our impact on climate change at the same time.

The latest scheme masquerading as a rational and responsible alternative to landfills is a nationwide – and worldwide – move to drastically increase the use of incineration... The principal consequence of incineration is thus the transporting of the community's garbage – in gaseous form, through the air – to neighbouring communities, across state lines, and indeed, to the atmosphere of the entire globe, where it will linger for many years to come. In effect, we have discovered yet another group of powerless people upon whom we can dump the consequences of our own waste; those who live in the future and cannot hold us accountable. Then US Senator Al Gore, 1992

ENDNOTES

¹Data sources:

Coal: Ontario MOE – OnAIR Annual Report 2002;

Natural Gas: US EPA – Fifth edition Compilation of Air Emission Factors Volume 1.

Mass-burn and gasification data from Niagara Region/City of Hamilton's EA — Wasteplan —

Appendix C — Air Emissions from Thermal Technologies.

² *Determination of the Impact of Waste Management Activities on Greenhouse Gas Emissions: 2005 Update Final Report*, ICF Consulting

October 31, 2005, submitted to Environment Canada and Natural Resources Canada

³ *A Changing Climate for Energy from Waste?*, Final report for Friends of the Earth, Eunomia 03/05/2006

