

UNEP International Environmental Technology Centre (IETC)

International Solid Waste Association (ISWA)

Joint thematic paper on waste and climate change

I. Introduction

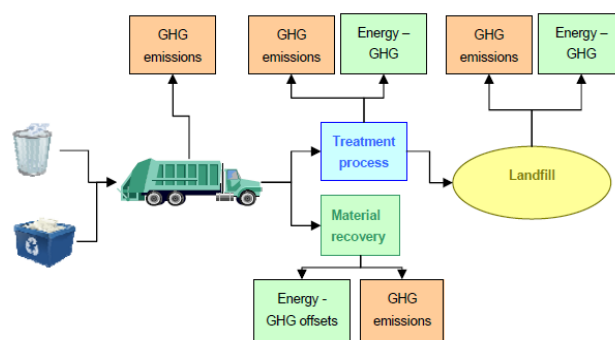
1. Waste management and recycling are key drivers of sustainable development, capable of utilizing existing technologies and best practices to promote resource conservation, improve public health, and reduce greenhouse gas (GHG) emissions.

2. The waste management sector is in a unique position to move from being a comparatively minor source of global greenhouse gas (GHG) emissions (approximately 3-5% of total anthropogenic emissions in 2005) to becoming a major contributor to reducing GHG emissions. Although minor levels of emissions are released through waste treatment and disposal, the prevention and recovery of wastes (i.e. as secondary materials or energy) avoids emissions in other sectors of the economy. A holistic approach to waste management has positive consequences for the reduction of GHG emissions from the energy, agriculture, transport, and manufacturing sectors.

II. Background

3. GHG emissions and savings are attributable to various stages of a waste management system. Figure 1 shows a simplified schematic of a municipal waste management system with the predominant climate impact sources. The general suite of activities – collection, separation, treatment, transfer, and disposal – applies to all waste types (i.e. municipal solid waste, commercial and industrial, construction and demolition, hazardous), with varying levels of sophistication, with the possible exception of agricultural waste.

4. Figure 1¹: Simplified schematic of waste management system and GHG emissions (applicable to urban waste management):



5. The sources of GHG emissions are multiple. However, methane emissions from landfill are generally considered to represent the major source of climate impact in the waste sector. It is worth noting that, if a broader view of waste management were taken, which included materials management, landfill methane would no longer be the largest source of GHG in the sector.

¹ United Nations Environment Programme, International Environmental Technology Centre: Waste and Climate Change: Global Trends and Strategy Framework, Osaka/Shiga, 2010

III. Climate benefits from improved waste management

6. The waste management sector offers an immediate, cost-effective, and fast-acting opportunity to achieve substantial cuts in global GHG emissions.
7. *Waste prevention, resource recovery, reuse and recycling* can minimize environmental impacts, lower costs, and reduce potential risks and liabilities across supply chains and in product disposal. As demand for virgin raw materials intensifies and energy demand accelerates, the capacity to recover, reuse, and recycle key materials — as well as prevent waste in the first instance — is essential to promoting economic development and maintaining competitiveness.
8. *Using existing technologies* with lower energy consumption and reuse of processed residuals that can be deployed at scale in virtually all regions and markets, waste management can be transformed into a net carbon reducer. Countless examples across the globe show that this is a mitigation strategy ready for scale-up.
9. *Recovery of energy* from waste processing and captured landfill gas, for use of electricity or in heating and cooling systems, *improved energy efficiency* and *fossil fuel avoidance* represent an important and growing opportunity for indirect reduction of GHG emissions in sustainable long term waste strategies.
10. In order to achieve reduction targets at all levels precise measurement of GHG emissions is critical. The accurate tracking of waste emissions and other inputs and outputs is fundamental to enhancing performance and attracting and maintaining adequate financial and technical support. Monitoring, reporting, and verification (MRV) methodologies for waste management currently exist and form a valuable foundation for the assessment of GHG emissions from waste activities.
11. A significant portion of the sector's GHG benefits corresponds to avoided emissions through energy and material recovery. In accordance with the Intergovernmental Panel on Climate Change (IPCC) methodologies used for national consolidation, these benefits are attributed to sectors other than waste. This does not allow for a complete view of the contributions from waste activities.
12. The waste management sector is well-positioned to promote sharing of technologies and to collaborate with both developed and developing country governments to craft projects and initiatives capable of attracting public and private financial support. Implementing effective waste management systems in developing countries, where population and urbanization are increasing rapidly, can bring a wide range of environmental, economic and social benefits.

IV. Waste management in the international climate negotiations

13. At the international level, waste management has been well represented among methodologies available under the Kyoto Protocol's Clean Development Mechanism (CDM) for the accrediting of emission reduction projects. More recently, the sector also has been active in the development of waste-related Nationally Appropriate Mitigation Actions (NAMAs) proposals for developing countries.
14. NAMAs represent an institutional platform for developing country governments to attract financial and technological assistance in organizing large-scale mitigation programmes. As the international climate change negotiations continue to progress toward a comprehensive global environmental governance regime for climate change, NAMAs are expected to play a critical role in enabling developing countries to meet domestic mitigation goals and pursue low carbon development pathways. However, to date, very little details have been provided on what must be contained in a NAMA and how these will be financed.
15. Waste management has proven experience and capabilities in areas broadly considered to be among the foundational building blocks of effective NAMAs:
 - a) Technology transfer
 - b) Quantified emission reductions
 - c) Policy and regulatory examples
 - d) Sustainable development co-benefits
 - e) Capacity building
 - f) Monitoring, Reporting and Verification Methodologies
 - g) Financing of waste management projects

16. Given that the waste management sector's climate benefits rely on existing technologies and proven methodologies, it is ready today for immediate implementation via public-private partnerships and other bilateral initiatives as well as through NAMAs, sector-based approaches, and new market mechanisms to be created in the context of a future climate regime.

17. In recognition of the substantial benefits that waste management and recycling can deliver on a global scale, the following opportunities for action exist in the on-going international climate change negotiations :

- a) Recognize the climate mitigation potential of waste management and recycling;
- b) Integrate and prioritize waste management and recycling strategies in national plans and initiatives, including NAMAs.
- c) Establish public-private partnerships, sector-based programs, and other international channels to disseminate best practices, attract new public and private investment in basic infrastructure, and strengthen domestic regulatory standards to maximize the climate benefits of waste management and recycling on a global scale.

18. There is still considerable uncertainty in regards to the international negotiations and the evolution of the carbon markets. The current economic context makes it difficult to factor in the value of emission reductions and has, in part, lead to oversupplies of Emission Reduction Units (ERUs) in the European Union Emission Trading System (EU ETS).

19. The international climate negotiations are complemented by other high-level initiatives and partnerships that aim, amongst others, at reducing GHG emissions from the waste sector. UNEP is playing a key role in these emerging initiatives, featuring as an official partner in the Climate and Clean Air Coalition (CCAC) and hosting the Global Partnership on Waste Management (GPWM), where the International Solid Waste Association (ISWA) is leading the focal area on waste and climate change.

20. The Climate and Clean Air Coalition (CCAC) was established in February 2012 as a voluntary international partnership to reduce short-lived climate pollutants (SLCPs) to slow the rate of climate change, to protect environmental and public health, and to promote food and energy security. Partners recognize that SLCPs can play an important role in slowing near term global warming and addressing long term climate change, *only* if accompanied by deep and immediate CO₂ reductions. The Coalition's work is therefore complementary to global efforts to reduce CO₂, in particular under the UNFCCC. One of the current five initiatives under this Coalition is the cooperation with cities to mitigate SLCPs from the municipal solid waste sector.

21. The Global Partnership on Waste Management (GPWM) is an open-ended, voluntary and collaborative relationship between various international stakeholders, in which all participants agree to work together to coordinate activities on waste management in a systematic way. The GPWM was launched in November 2010 to enhance international cooperation among stakeholders, identify and fill information gaps, share information and strengthen awareness, political will, and capacity to promote resource conservation and resource efficiency. ISWA joined the GPWM in 2011 and launched a focal area on Waste & Climate Change. ISWA's key missions, as focal area lead, are:

- a) to increase awareness of the GHG emissions associated with waste activities (energy and material recovery, resource management);
- b) to promote the actions within the sector that contribute to reduced GHG emissions;
- c) to contribute to the advancement of technical and scientific knowledge on the subject;
- d) to prepare various communication tools and reports and to organize conferences on the subject over the next couple of years.

V. Conclusion

22. The waste sector has the potential to contribute substantially, through waste avoidance, material recovery and energy recovery, to the net reduction of GHG emissions. However, in order to tap the full potentials, a number of challenges lie still ahead. Sustainable financing mechanisms, technology transfer from developed to developing countries, adequate regulatory frameworks, etc. need to be scaled up in order to transform the waste sector into a veritable carbon sink. A coordinated international approach, at the level of the international climate negotiations and through cooperative partnerships, such as the CCAC and the GPWM, is needed to address the existing technical, economic and financial deficiencies in an adequate manner.