
Incorporating the Waste Sector into a Country NAMA

Global Methane Initiative Partnership Meeting

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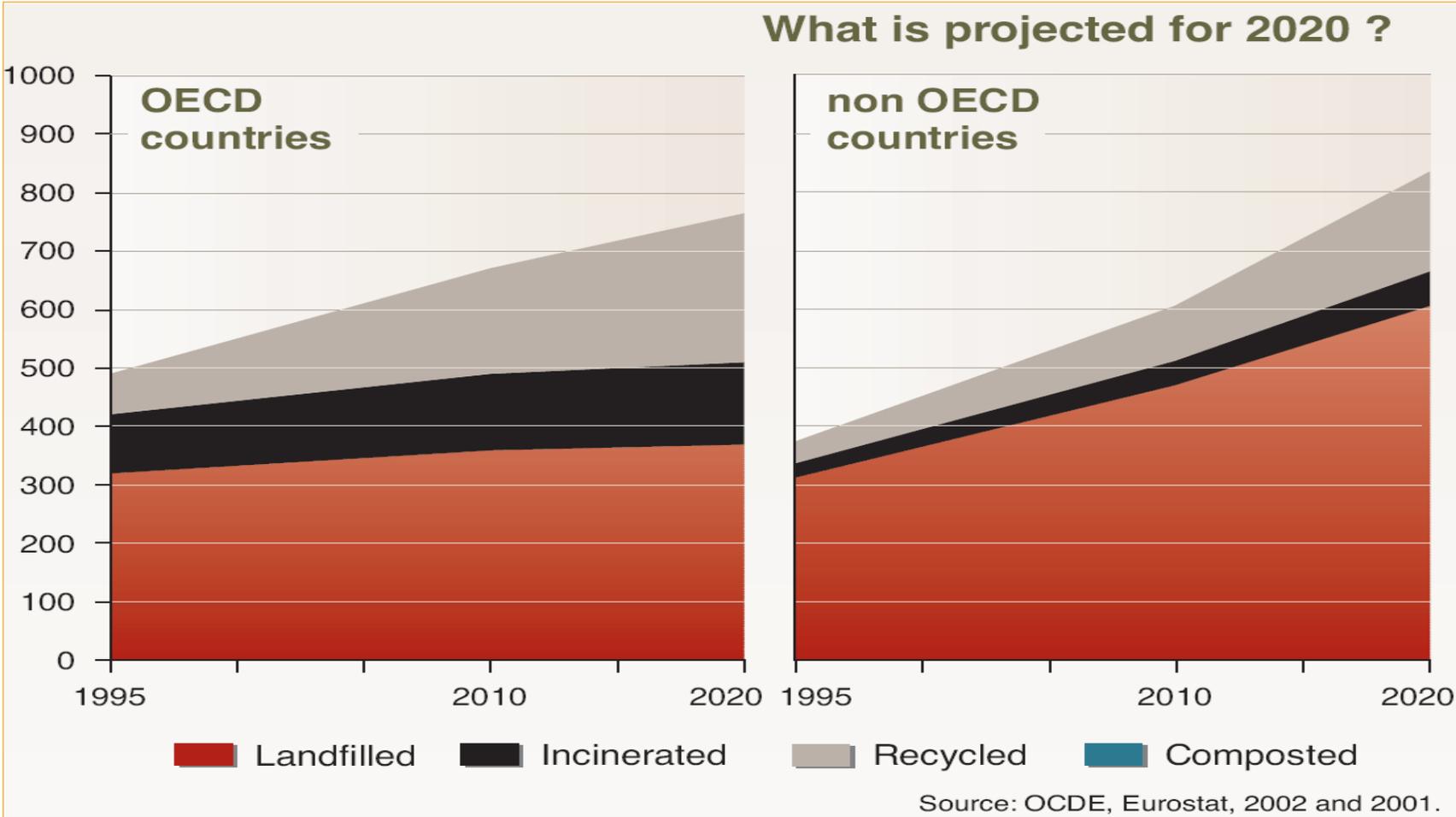


Introduction

- Climate change is one of the most important global environmental issues facing our planet.
- In recent years, there has been increased international attention to this subject: the goal is to make all possible efforts to limit global warming to 2°C.
- In order to stabilize the levels of GHGs in the atmosphere, a portfolio of mitigation solutions has to be implemented.
- The waste sector must be part of this portfolio and can deliver significant GHG savings.
- It will also requires considerable scaling up of mitigation efforts in developing countries.
- Developed countries have agreed to support developing countries with this significant task, through capacity building, technology transfer and financing.



Evolution of waste generation / treatment



Rapid increases in population and urbanisation are resulting in increased waste generation in developing countries.

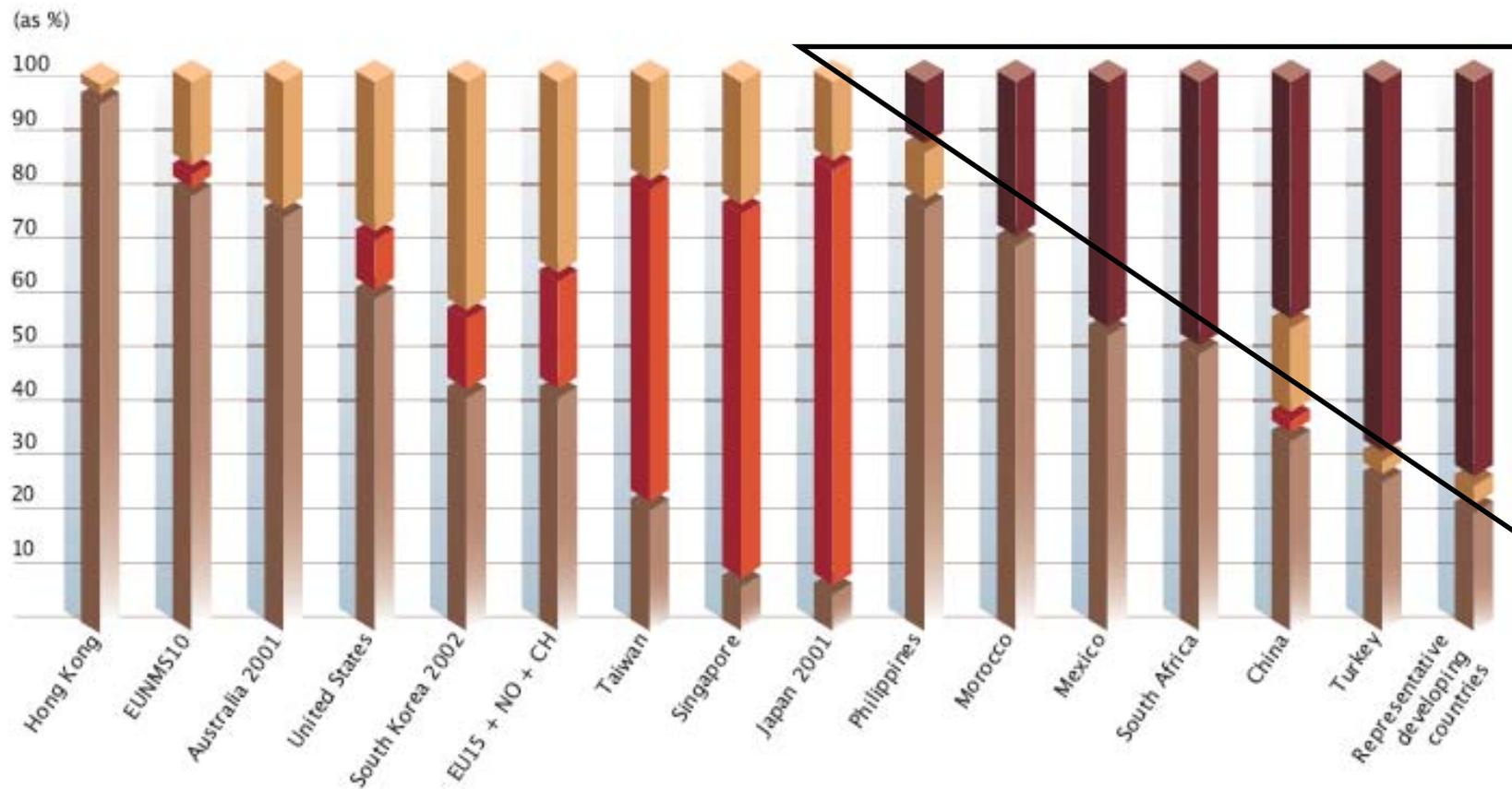


Municipal waste treatment

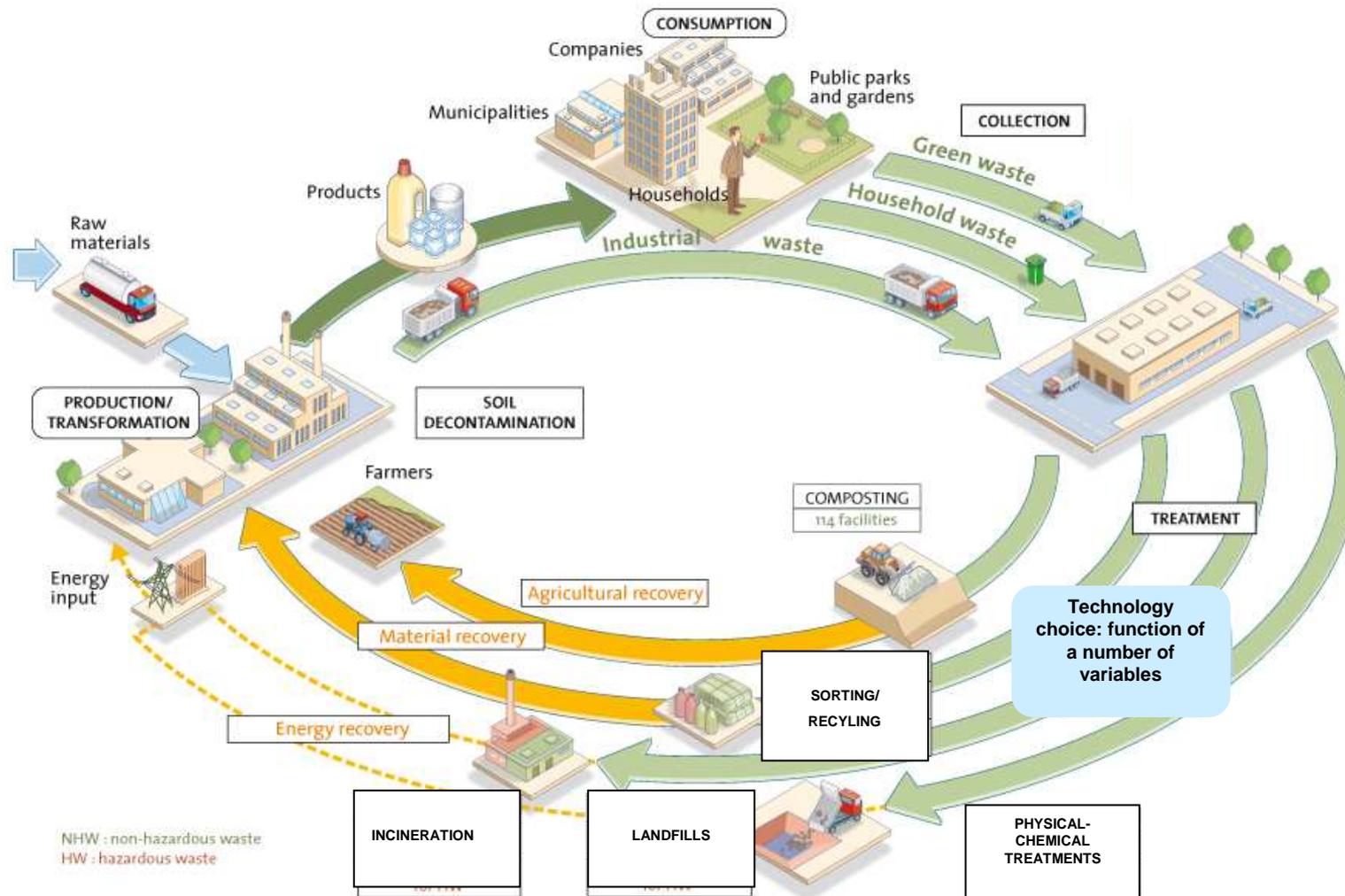
Municipal waste treatment breakdown in a selected number of countries (as %)



Sources: National Environmental Agencies, OECD, Eurostat, CycloPe



Waste Cycle – Turning waste into a resource



The waste industry puts forward an integrated solutions approach: the choice of a particular technology is a function of a number of variables such as costs, waste quantity and characteristics, regulations, and policy considerations...

Actions to reduce GHG emissions



Collection and transportation

- *Rationalization of collection operations and improvement of fuel efficiency.*
- *Use of alternative fuels (biodiesel, bioethanol...)*
- *Development of alternative means of transportation (rail and waterway transport...)*
- *Implementation of driver training programs*

Recycling

- *Increase of the material recovery rate to save energy.*
- *Recovery of substitute fuels (waste oil, refuse derived fuels...)*



Waste to energy

- *Substitution of energy produced from fossil fuels by thermal energy and electricity from waste combustion.*
- *Recovery of metals and bottom ashes from incineration.*

Biological treatment

- *Increase the compost production, low emitting treatment solution.*
- *Recovery of the methane from anaerobic digestion processes*



Landfill

- *Installation of active landfill gas collection and treatment systems*
- *Use of landfill gas as a fuel to produce electricity or thermal energy*

Landfill gas capture and recovery

Landfills are the major contributors to climate change in the waste sector, through their fugitive methane emissions. It is therefore a priority to reduce these direct emissions and to increase avoided emissions.



Actions to reduce emissions

- **Install active landfill gas collection and treatment systems**
- **Use landfill gas as a fuel to produce electricity or thermal energy.**



Europe's CH₄ emissions from landfills decreased by 40% between 1990 and 2008. (EEA)



Australia's CH₄ emissions from landfills decreased by 12.6% between 1990 and 2005. (Australian Dep. Of Climate Change)



US CH₄ emissions from landfills decreased by 20% between 1990 and 2009 (US EPA)

Organic Recovery

Composting is a low GHG emitting solution. It can be a means to divert organic waste from landfills and avoid the associated methane emissions.

Actions to reduce emissions

- Increase compost production
- Use of compost as a soil amendment can contribute to GHG reductions by:
 - reducing production and importation of inorganic fertilizer,
 - the substitution of peat in the production of growth media, and
 - binding carbon in soils.
- **Recover methane from anaerobic digestion processes to produce heat and/or electricity.**



The fact that Anaerobic Digestion allows for the recovery of renewable energy from organic waste has stimulated further interest in this technology.

Referenced values for AD in study:

- Compost Production : 295 kg/t waste
- Energy Consumption : 50 kWh/t waste
- Energy Production : 160 kWh/t waste

Source: Ecofys' study "*Sectoral Emission Reduction Potentials and Economic Costs for Climate Change (SERPEC-CC)*" – Chapter « Waste » - October 2009

Nationally Appropriate Mitigation Actions (NAMAs) – What are they?

NAMAs Background

- NAMAs initially came up in the ***Bali Action plan***, published in 2007, and were defined in the following context:

“**Nationally appropriate** mitigation actions by developing country Parties in the context of **sustainable development**, **supported** and enabled by technology, financing and capacity-building, in a **measurable, reportable and verifiable** manner.”

- The **Copenhagen Accord** led to several voluntary NAMA communications submitted to UNFCCC
- **Cancún Agreements** took note of NAMA pledges and decided on
 - NAMAs link to performance-measurement
 - NAMA registry
 - Green Climate Fund (up to US\$ 100 billion per year by 2020)
 - New market based mechanisms to be discussed at COP 17
- There is no clear definition of NAMAs in the Cancún Agreements or other documents and decisions.

NAMA Finance Structure

Three types of NAMAs are differentiated:

- NAMAs domestically funded and unilaterally implemented (**unilateral NAMAs**),
- NAMAs implemented with financial, technological and/or capacity building support from developed countries (**supported NAMAs**), and
- NAMAs implemented with funding from carbon offset credits generated for the amount of emission reductions achieved (**credited NAMAs**).

Submitted NAMAs with referenced waste actions 1/2

| Country | Extract of Text |
|--------------------------------|---|
| Argentina | The National Plan for the Integral Management of Urban Solid Waste is supported by a loan from the World Bank for the construction of sanitary landfills and landfill gas capture |
| Armenia | Decrease CH4 emissions from solid municipal waste and wastewater |
| Benin | The recovery of CH4 emitted by landfills in local communities with a special status |
| Central Africa Republic | The recovery of household waste (solid and liquid) from large cities for the production of green fertilizers and energy production (biogas) |
| Colombia | Colombia communicated that it is undertaking studies on its mitigation potential and on abatement cost curves for the transport, agriculture, energy, waste management and industrial sectors as part of its national strategy of low-carbon emissions development. |
| Costa Rica | On a preliminary basis, efforts will focus on the following sectors: (a) Transport; (b) Energy; (c) Forestry; (d) Waste management. |
| Ethiopia | 9 specific waste management projects listed with quantified reduction and growth rate estimates |
| Gabon | The construction of waste and wastewater treatment centres; development under the CDM. |

Sources: CD4CDM, UNEP Risø Centre; FCCC/AWGLCA/2011/INF.1 and unfccc.int/meetings/cop_15/copenhagen_accord/items/5276.php

Submitted NAMAs with referenced waste actions 2/2

| Country | Extract of Text |
|---------------------|---|
| Ghana | Net CH4 emissions due to the inappropriate management of waste : promote waste separation and composting, support waste-to-energy initiatives; capture and utilize CH4 gas from landfill sites, and institute measures to minimize waste generation |
| Indonesia | A reduction in solid and liquid waste |
| Jordan | Recycling projects to improve solid waste management; Emission reductions from 8 solid waste management projects |
| Madagascar | Recover the household waste (solid and liquid) of large cities for the manufacturing of fertilizers and energy production (biogas, electricity) |
| Morocco | 3 projects cited including CH4 capture from uncontrolled and uncontrolled landfills and wastewater treatment plants |
| Peru | The design and implementation of measures which allow the reduction of emissions caused by the inappropriate management of solid waste. |
| Sierra Leone | The development of agricultural and urban waste incineration programmes for energy production; Improved waste management through the composting and recycling of waste |
| Macedonia | GHG emission reductions at existing landfills, including the installation of CH4 recovery and flaring systems at some selected landfills; The construction of regional solid waste disposal sites; |

Sources: CD4CDM, UNEP Risø Centre; FCCC/AWGLCA/2011/INF.1 and unfccc.int/meetings/cop_15/copenhagen_accord/items/5276.php



What are NAMAs?

- Voluntary mitigation actions implemented by a developing country
- Any government sponsored policy, programme, or project that results in measurable GHG reductions compared to « Business as Usual » scenarios
- Meant to scale up both GHG reductions and finance provided under the CDM and other climate finance instruments

Waste sector – significant greenhouse gas emission mitigation potential

NAMAs including waste management & recycling

- NAMAs should include sustainable waste management and recycling
- The sector has proven experience and capabilities in the following key elements of NAMAs:
 - ☑ Technology transfer
 - ☑ Policy examples
 - ☑ Sustainable development co-benefits
 - ☑ Capacity building
 - ☑ Monitoring, Reporting and Verification Methodologies
 - ☑ Financing of waste management projects

Technology Transfer through the CDM

The transfer of sustainable technology to developing countries is crucial to reducing GHG emissions. The CDM, introduced under the Kyoto Protocol, has provided an opportunity for the waste sector to make significant advances towards this goal.

- The **CDM** has been successfully implemented with **3497** registered projects and many more in the pipeline.
- The waste sector is well represented amongst the registered projects, accounting for **14%**.
- Currently registered Landfill gas and methane avoidance projects (including manure mgmt. & wastewater) are expected to deliver more than **237 million** carbon credits by the end of 2012.
- The CDM serves as an example of how private investments can dwarf public sector contributions.
- However, the CDM has been struggling with lengthy procedures for project registration and credit issuance, with an increasing uncertainty on the outcome.
- It may be that the post-2012 international climate regime will include both the CDM and NAMAs operating in parallel.

Source: CD4CDM CDM Pipeline, October , 2011; UNFCCC website

Technology Transfer through the CDM

Landfill Gas to Energy Project in Bogota, Colombia

- Awarded to company entitled Biogas Dona Juana (50 % GRS Valtech (operated by Proactiva Colombia); 50 % Gas Natural)
 - Project activity : Installation of an active landfill gas collection system
 - Combustion of landfill gas in flares, utilisation of landfill gas in engines to produce electricity and for thermal energy in up to 70 brick factory kilns surrounding the site
 - Crediting period : 7 years, renewable twice maximum
 - Estimated Emission Reduction :
~ 5,800 ktonnes of CO2 eq / 7 years
 - Project registered 10 September 2009



Policy / Regulations

Waste regulations and policies can be strong national drivers to reduce GHG emissions.

- Waste policies and regulations containing precise long-term and intermediate targets for better handling of waste are important drivers for the reduction of GHG emissions.
- Where implemented, such waste management policies and regulations can create significant GHG emission reductions.
- Each country and city has a unique starting point in terms of waste composition, waste technologies and infrastructure, climate conditions, and economic means to enact adequate policy and regulation frameworks.
- Establishing clear waste policy and regulations will help to leverage private sector finance for the NAMAs.

Policy / Regulations

| Actions related to | Examples of policy and regulation instruments |
|---|---|
| Waste generation and collection | Producer responsibility "Full cost" collection tariffs Separate collection schemes for specific waste types |
| Material recycling sector | Strategies and precise targets for recycling of specific waste streams Producer responsibility Landfill tax Tax exemptions for recyclable materials Green Public Procurement to stimulate demand for recycled products |
| Incineration and anaerobic digestion sector | Co-ordination with energy planning Subsidies for construction Landfill ban of biodegradable waste Secure sufficient waste to the plants Tax exemptions for energy generated Emissions limitations |
| Landfill sector | Strategies for phasing out old landfills Landfill ban on biodegradable waste or untreated waste High technical standards in general and especially for performance to reduce GHG emissions by capture and utilisation of the energy Landfill tax |

Sustainable development co-benefits

- **Environmental benefits**

- ✓ Reduced GHG emissions generation
- ✓ Reduced environmental degradation from uncontrolled waste disposal
- ✓ Material recovery enables natural resource and energy conservation
- ✓ Energy recovery helps to reduce demand on limited natural resources

- **Economical benefits**

- ✓ Access to international financing
- ✓ Revenues from the sale of emission credits, recovered energy and materials
- ✓ Foreign expertise and training received to facilitate smooth technology transfer

- **Social benefits**

- ✓ Improved sanitary and health conditions
- ✓ New facilities / projects create local job opportunities
- ✓ Staff training to improve skills of locals.

Monitoring, Reporting & Verification

Accurate measurement and quantification of GHG emissions are critical in order to set and monitor realistic GHG emissions reduction targets at all levels. Current methodologies form a valuable database for assessment of GHG emissions from waste activities, however, improvements are required to adequately represent the full life cycle of materials and energy.

- A number of reliable reporting and quantification tools of GHG emissions from waste management activities exist.
- The various tools have differing objectives, parameters and scopes (see next slide).
- These tools are essential to help the waste management industry as well as other stakeholders to evaluate and compare how the sector can reduce GHG emissions and increase savings.
- These tools can be helpful in the development of Baseline calculations and on-going monitoring for NAMAs.



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 **ISWA**
International Solid Waste Association

Monitoring, Reporting & Verification

Greenhouse Gas Accounting Methods / Tools

| Reporting Methods | Reporting Level | Purpose | Examples |
|--|---|---|--|
| Mandatory national reporting of GHG emissions | National | National GHG reporting for the Nations who signed the UNFCCC | IPCC (Intergovernmental Panel on Climate Change) Methodologies |
| Mandatory/Regulatory annual reporting for regulated facilities covering numerous parameters including GHGs | Installation | Regulations for integrated pollution prevention and control. These reporting requirements help to improve public access to information on the environment. | Pollutant Release and Transfer Register (PRTRs) - (Europe) |
| | | Reporting specific to GHG emissions in the framework of cap and trade systems. | ETS directive (guidelines for monitoring and reporting GHG emissions from covered installations) |
| Annual Reporting Protocols to prepare GHG inventory for companies, local governments, or facilities (often on a voluntary basis) | Company/ local government organisation | Regular GHG reporting on the organisational level. | GHG Protocol (WRI / WBCSD) EpE Waste Sector Protocol (2007) ISO 14064 |
| Life Cycle Analysis used in decision making or planning support | Various (National, regional, local) | LCA modelling of waste management systems is carried out in order to form a technical and environmental platform for decision making. | ISO 14048 |
| Carbon Trading Project Mechanisms | Project | Different project-based flexible mechanisms are operational. The estimation of their emission reductions is obtained through a "baseline versus project" approach | CDM approved methodologies Voluntary project standards Offset protocols (CCX, RGGI...) CCAR landfill protocol... GHG Protocol for Project Accounting |

Examples of waste related actions for NAMAs

1. Conduct an evaluation of current waste practices
2. Conduct assessment to understand waste quantities generated and recovered, waste composition, and trends
3. Conduct an analysis of current waste policies and regulations
4. Evaluate existing informal waste recycling sector
5. Create a Public Awareness Programme
6. Develop a (baseline) greenhouse gas Inventory
7. Provide awareness training to change behavior
8. Develop / modify national waste management and recycling strategy
9. Establish appropriate regulatory enforcement strategy
10. Improve co-operation on waste policies on all levels (national, regional, and local)
11. Conduct feasibility study for most suitable integrated waste management and recycling system at a national, regional or city level
12. Establish plan to Improve waste collection rates
13. Define strategy to Improve energy and material recovery
14. Ensure that all active landfill have proper environmental controls including LFG capture and recovery
15. Conduct specific landfill site feasibility studies
16. Establish recommended monitoring, reporting and verification programme

ISWA Climate Lobby Initiative

ISWA has launched a Climate Lobby Initiative to promote the sector's strong messages in national and international climate discussions:

- the waste sector can contribute to significant near term GHG mitigation potential.
- Waste and recycling that it should be part of the Nationally Appropriate Mitigation Actions (NAMAs) considered by countries, regions, and cities.
- that the sector represents a key investment area for cost-effective carbon abatement as well as other essential environmental benefits.
- the waste sector should be amongst the priority areas for Green Climate Fund support.

Conclusion

- The NAMA concept is still very broad and lacks **regulatory guidance** and experience
- To mobilise **private sector funding** **clear rules and definitions are required**
- « **Learning by doing** », **pilot projects and actions** should be launched to gather experience for NAMA rules and to define financing needs and structure
- On the positive side, we are starting with a « clean page » to identify the most appropriate actions, baseline analysis, MRV metrics...



Thank you for your attention !

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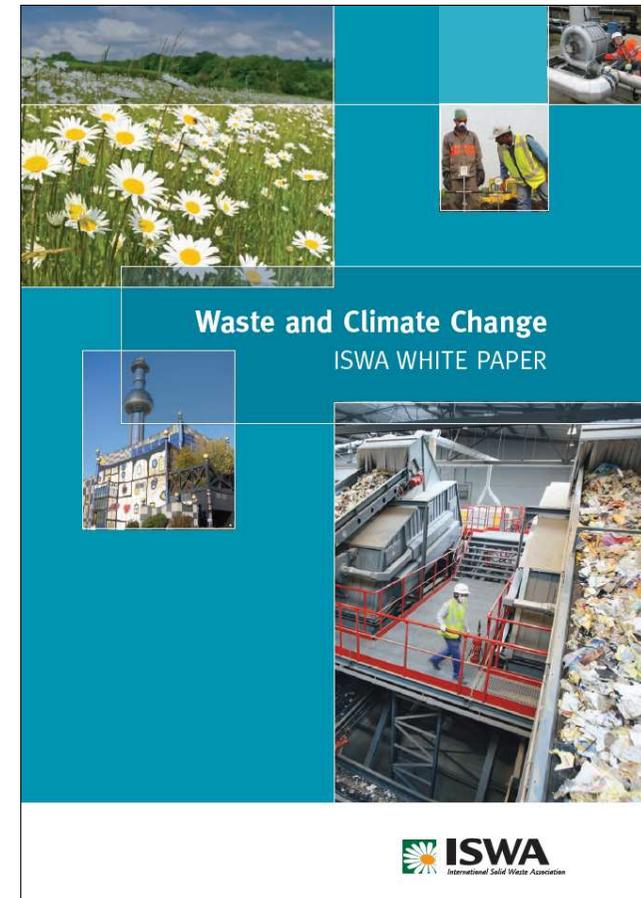


ISWA Working Group on Waste Management & Climate Change

- ISWA initiated a Working Group on Waste Management & Climate Change that is picking up where the Task Force left off.
- The key missions of the WG are:
 - to increase awareness of the GHG emissions associated with waste activities (energy and material recovery, resource management)
 - to promote the actions within the sector that contribute to reduced GHG emissions.
 - to contribute to the advancement of technical and scientific knowledge on the subject
 - to put together various documents or reports and to organise conferences on the subject over the next couple of years.
- The WG will participate in and support the recently launched ISWA Climate Lobby Initiative

ISWA White Paper : Waste and Climate Change

- In 2009, ISWA released its **White Paper on Waste and Climate Change**.
- The White Paper (WP) identified 8 key messages covering the following topics:
 - Potential reducer of GHG emissions
 - Proven Technologies
 - Material Recovery
 - Organic Recovery
 - Energy Recovery
 - CDM Opportunities
 - Waste policies and regulations
 - GHG accounting



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