

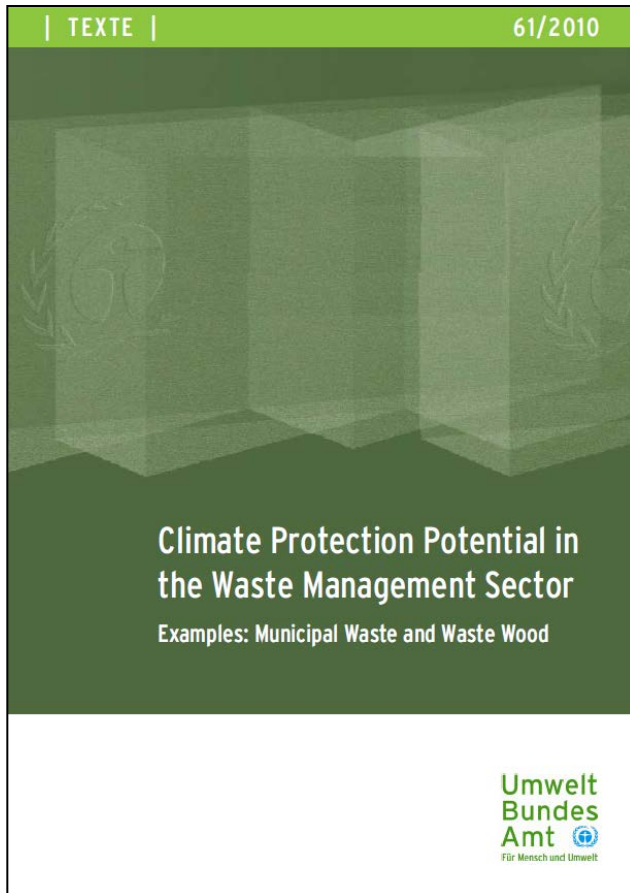


GHG mitigation potential in the waste management sector in EU27, in the OECD countries and developing countries

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*International Conference
Elements of a Greenhouse Gas Neutral Society*

10./11.10.2013 Berlin



Selected results of a completed
study for Germany and EU27
(January 2010)

and first results of an ongoing
study for OECD-Countries, India
and Egypt

both in cooperation with Öko-
Institut

on behalf of

Federal Environment Agency

Overview

- 1 Goal of the studies
- 2 Methodology
- 3 GHG-balance for the EU27 (2010 study)
- 4 GHG-balance for India (current study)
- 5 Overview waste treatment countries considered

Goal of the studies

- Goal:
to demonstrate the GHG mitigation potential in the waste management sector in industrialised countries and in developing and emerging economies
- Main focus:
 - Industrialised countries: material recycling and waste to energy options
 - Developing and emerging economies: integrated waste management and diversion from landfill

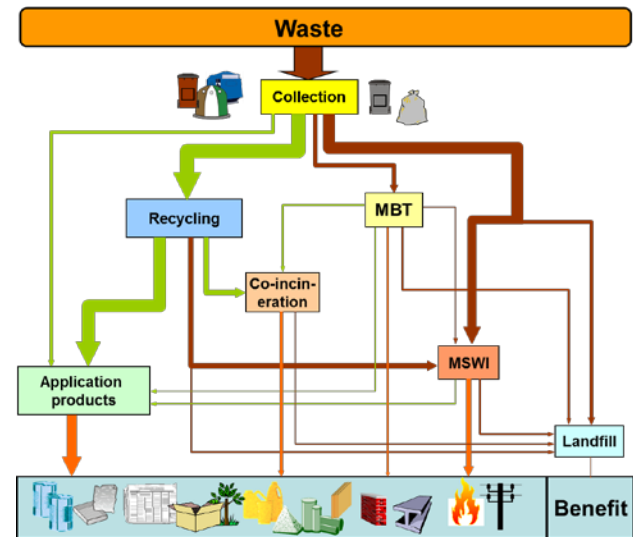
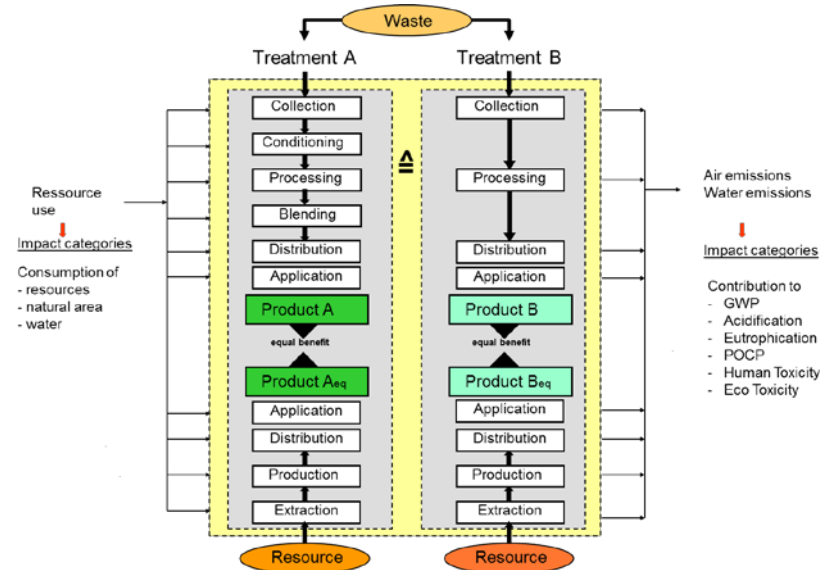
LCA in waste management

- System comparison „cradle to grave“ starts with waste („previous life“ excluded), ends with purpose of waste treatment (secondary product, energy, disposal)



Benefits of compared systems must be the same = credits for secondary products

- All emissions from waste treatment are related to the waste amount considered (landfill 100 years horizon)



Sector approach and calculations

- Sector approach takes into account that waste treatment and recovery of waste (as secondary material or energy) avoids emissions in other sectors of the economy
- Waste prevention (or increase) cannot be assessed with this approach (principle of equal benefit of scenarios)
- Calculations for each waste type (source separated collection) and for residual waste (landfill, incineration, MBT)
- Assumptions for potential scenarios: considering a moderate (feasible) and an ideal scenario (high GHG mitigation)

Waste quantities and scenarios EU27 (2010 study)

2007 current situation

Waste amount:
250 mill. tonnes

Waste treatment:
42% landfill
21% incineration
8% MBT
(incl. MSW composting)
16% Recycling
13% Composting



EU27 Potential 2020

Assumptions:
ban on landfill; technology similar to Germany

Scenarios:

- 2020 I

waste no more landfilled uniformly distributed as in 2007

→ recycling rate 50%
(EU waste frame directive)

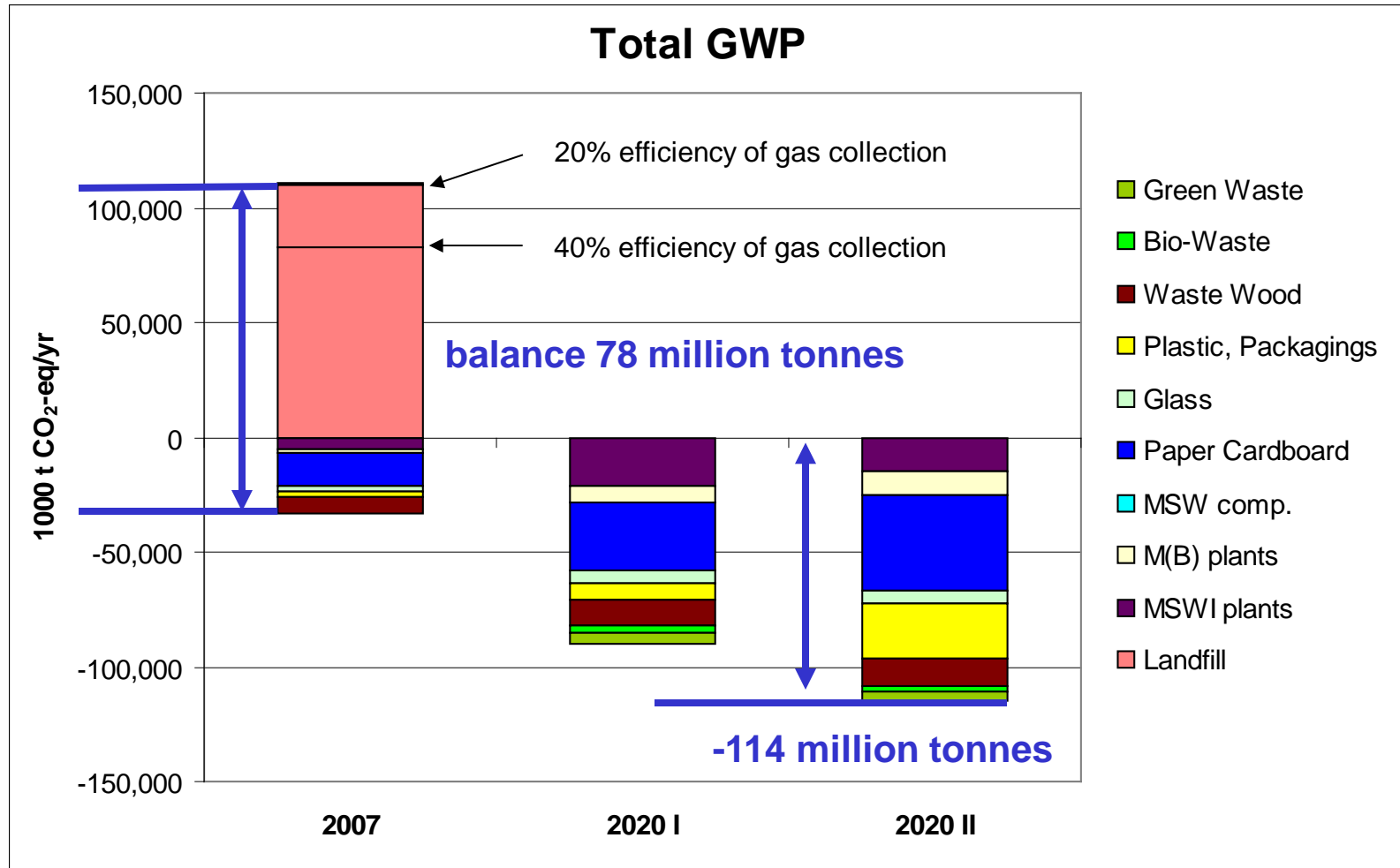


- 2020 II

waste no more landfilled treated like current practice in Germany

→ recycling rate 62% (Germany 2007)

GHG balance of MSW in the EU27 (2010 study)



Conclusions

- 2007 GHG emissions from landfilling in the EU27 caused up to **110 million tonnes CO2-equivalents**
- Including credits a net emission of up to **78 million tonnes CO2-equivalents** remains
- The potential GHG savings for 2020 (scenario 2020 II) are up to **114 million tonnes CO2-equivalents**
- Increase of recycling and technical optimisations until 2020 achieve total net savings of up to **192 million tonnes CO2-equivalents**
- This corresponds to **32%** of the 600 million tonnes CO2-equivalents that the EU27 still has to minimize according to the voluntary target for 2020

Waste quantities and scenarios India (current study)

(2005) current situation

Waste amount:

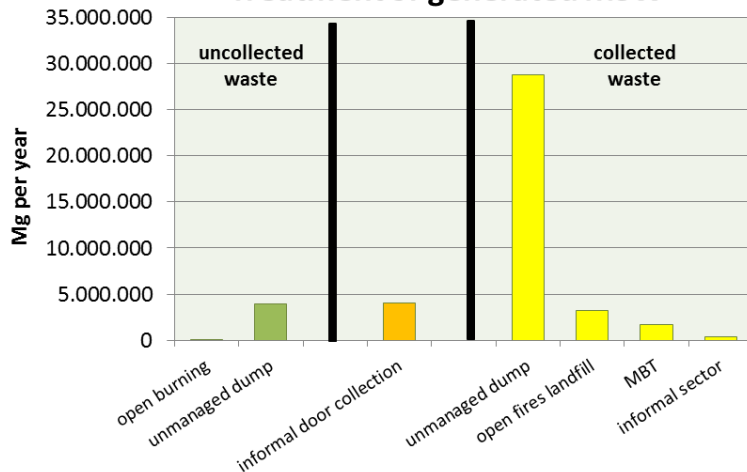
42 million tonnes
(could be up to 240 million)



Waste treatment:

86% landfill
4% MSW composting
10% Recycling

Treatment of generated MSW



Scenarios 2030

Assumptions:

no change in informal recycling sector; all MSW is collected

Scenarios:

- „low-tech“

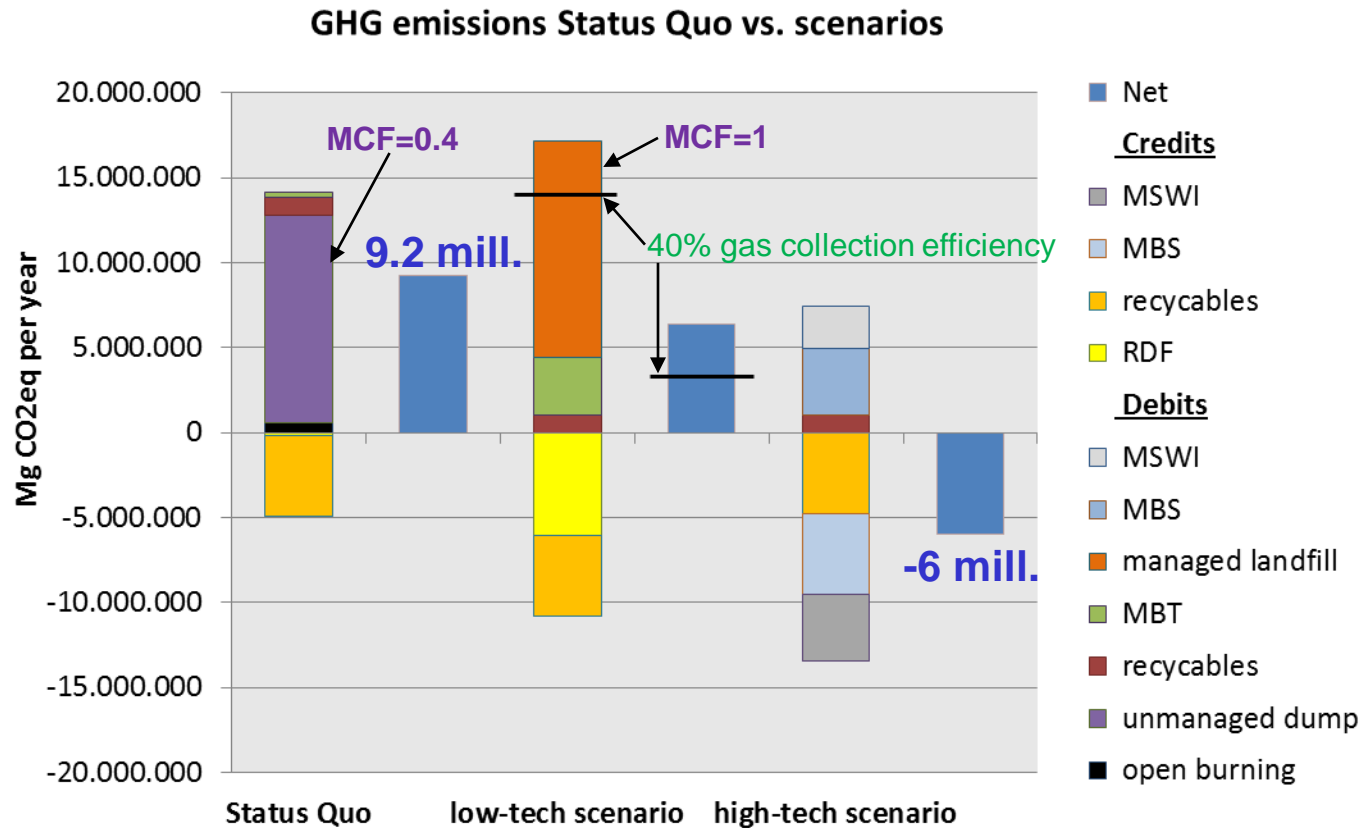
50% managed landfill with 20% gas collection efficiency; 50% MBT with 20% of input RDF to co-incineration



- „high-tech“

50% MBS with 38% of input RDF to co-incineration; 50% MSWI plastics removed and recycled in advance

GHG balance of MSW in India (current study)



Conclusions

- Status Quo GHG emissions from landfilling in India caused about **10 million tonnes CO2-equivalents**
- Including credits a net emission of about **9 million tonnes CO2-equivalents** remains - with high waste quantity (240 mill. tonnes) the net emission would be 54 million tonnes CO2-equivalents
- The „low-tech“ scenario achieves a GHG mitigation of **30%** (60% with 40% gas collection efficiency); the „high-tech“ scenario leads to a net benefit and an overall GHG mitigation of about **15 million tonnes CO2-equivalents**
- In case the MCF for unmanaged dumps is higher than considered by Indian authorities the current GHG emissions would be higher and with this also the GHG mitigation

Waste treatment in countries considered

2010	Landfill	Incineration	Recycling	Composting
OECD	49%	20%	20%	11%
USA	54%	12% (WtE)	26%	8%
EU27	38%	22%	25%	15%
Germany	0%	38%	45%	17%
India* (2005)	86%	0%	10%	(4%)
Egypt*	86%	0%	4%	4% (6% Feeding)

* Collection rate India av. 60%, Egypt 43%

* Informal sector India 9.5%, Egypt 11%

Summary conclusions

- Diversion from landfill is the main contributor to GHG mitigation in the waste management sector
- Due to a high rate of landfilling there is a high potential for GHG mitigation in developing and emerging economies but also a potential in some OECD countries
- Even in case of managed landfills with a high gas collection efficiency a significant GHG mitigation still remains due to the potential of benefits from material recycling and from waste to energy (especially co-incineration)
- Better waste management not only offers a way to cut GHG emissions but also contributes to more efficient resource use and reduced impacts on human health and the natural environment

Thank you!

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