

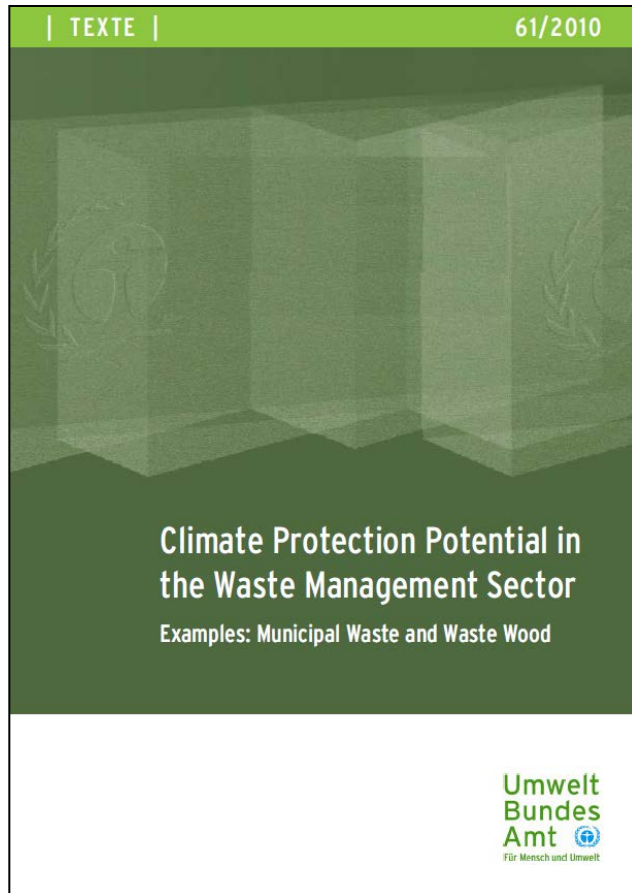


# GHG mitigation potential in the waste management sector in EU27, in the OECD countries and developing countries

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**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

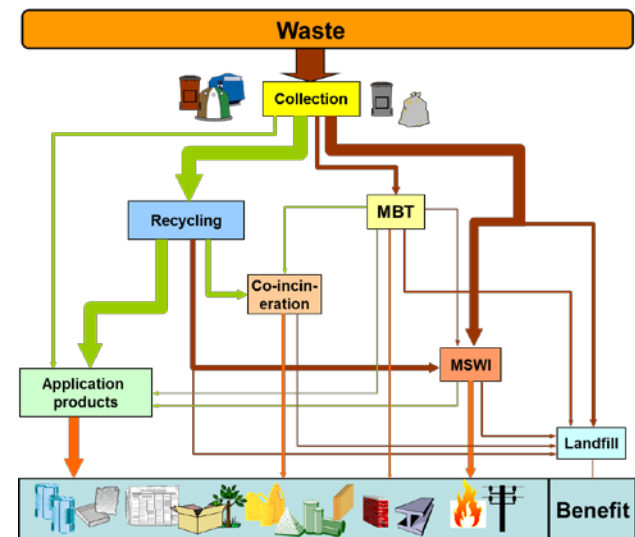
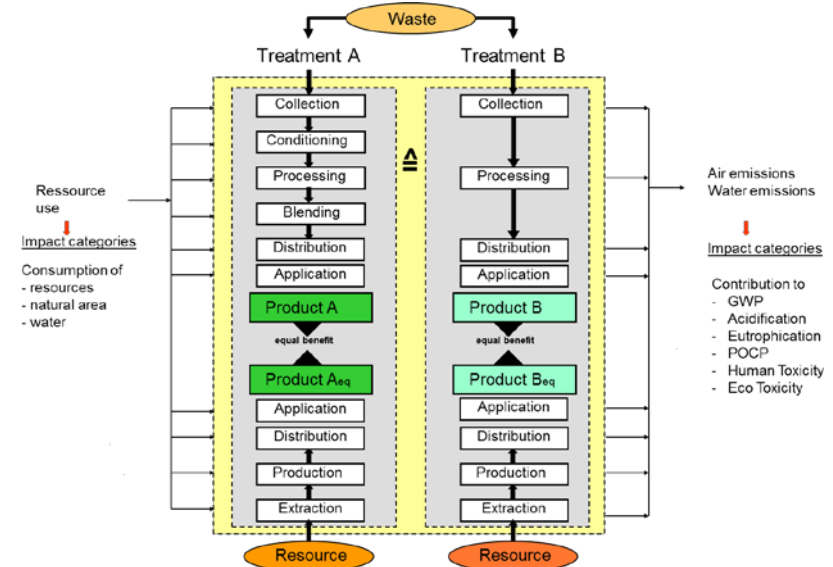
# LCA in waste management

- 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

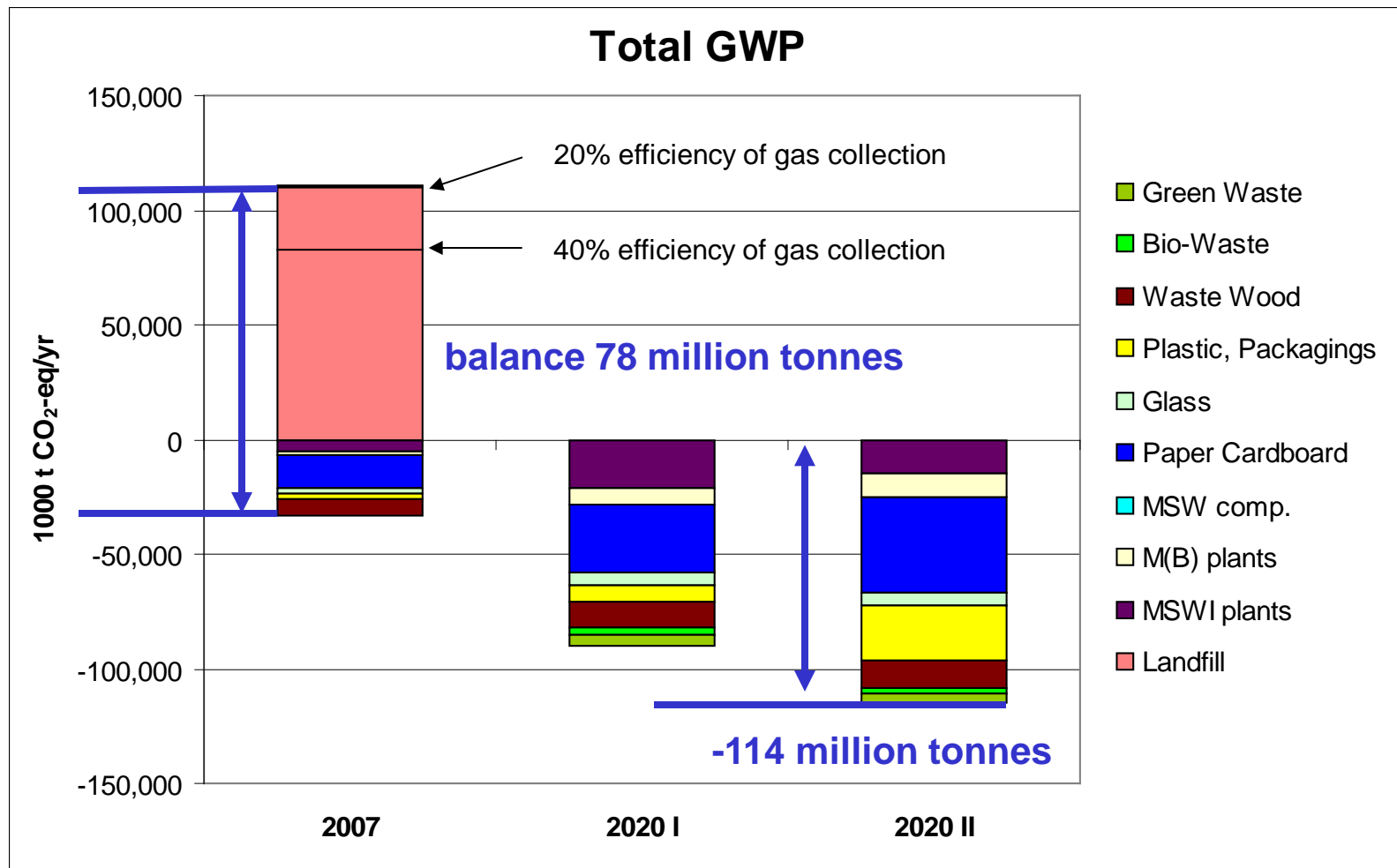
→ recycling rate 50%  
(EU waste frame directive)

- 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)

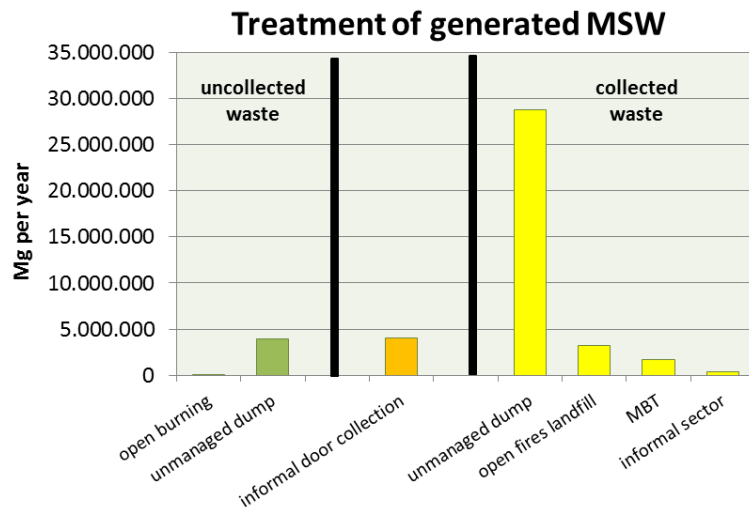
## (2005) current situation

Waste amount:

**42 million tonnes**  
(could be up to 240 million)

Waste treatment:

**86% landfill**  
4% MSW composting  
10% Recycling



## Scenarios 2030

Assumptions:

no change in informal recycling sector; all MSW is collected

Scenarios:

- „low-tech“

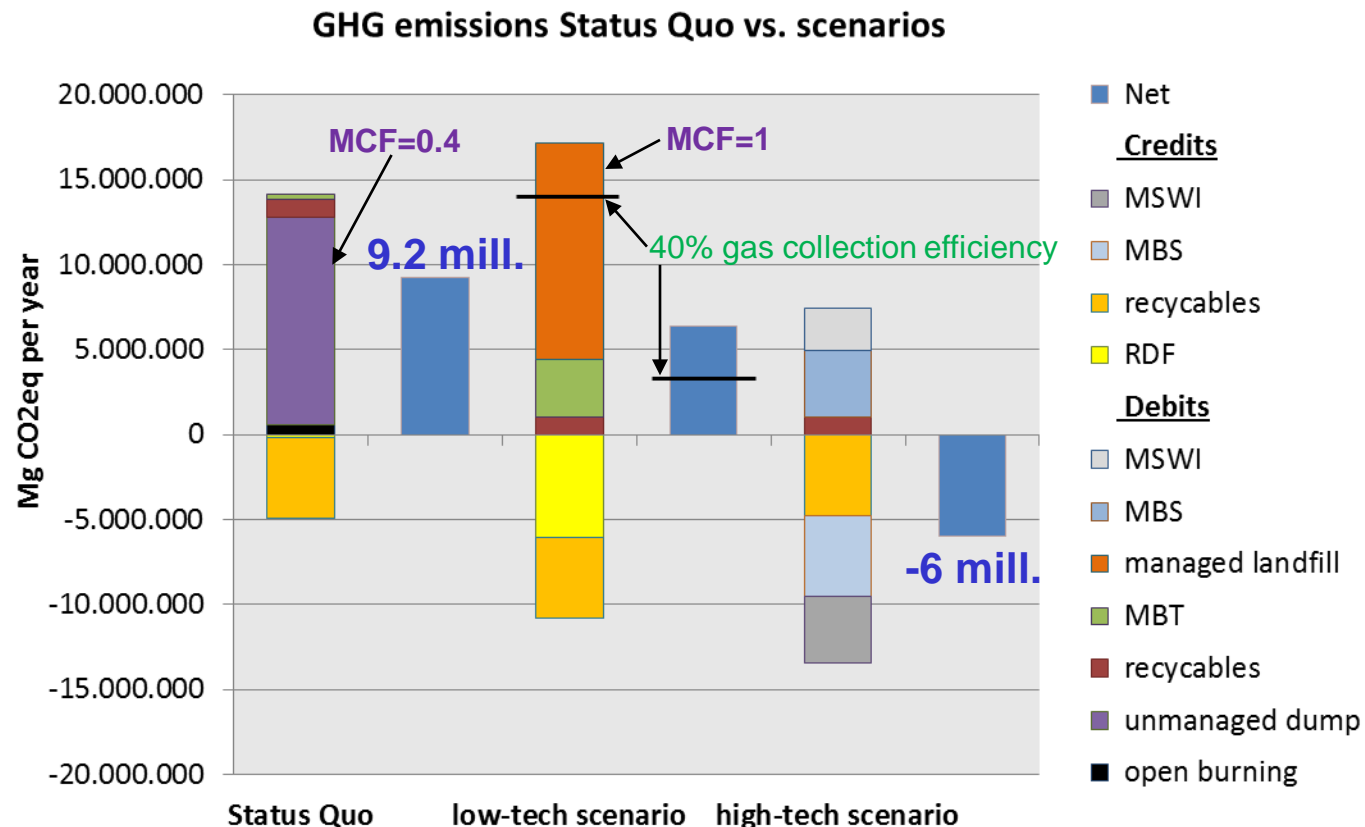
50% managed landfill with 20% gas collection efficiency; 50% MBT with 20% of input RDF to co-incineration

- „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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