

Methods to calculate GHG mitigation potentials in Solid Waste Management

„few background information“

Workshop on behalf of a project commissioned by

18 June 2012 Berlin, Germany



Regine Vogt, Jürgen Giegrich
IFEU Heidelberg
(Institute for Energy and Environmental Research)

Cornelia Merz, Günter Dehoust
Öko-Institut e.V., Darmstadt

- **Why GHG accounting in waste management?**
- **Overview different GHG accounting methods**
- **Differences in studies with LCA approach**

GHG accounting in general

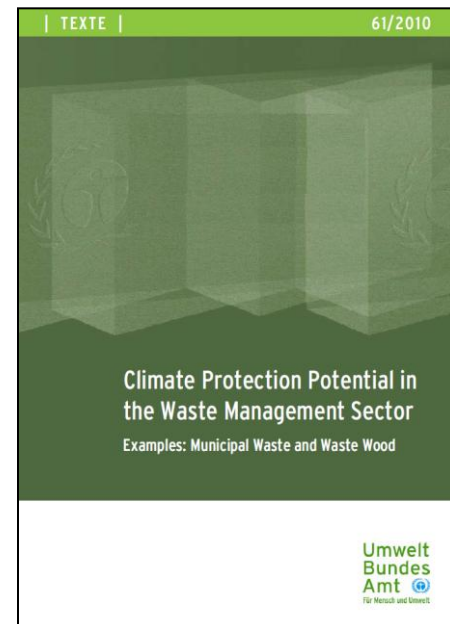
overall aim to avoid climate change and/or minimise negative effects from climate change needs calculation and monitoring of GHG emissions

GHG accounting in waste management

possible contribution of the waste sector for GHG mitigation is significant; with implementing waste management systems 10-15% reduction is possible (using LCA approach for calculation)

E.g. results from UBA study
GHG mitigation potential of
selected countries:

Turkey	13%
Tunesia	16%
Mexico	10%



GHG inventory

Purpose	Method/Organisation	Level	GHG emissions
Reporting (mandatory)	Kyoto-Protocol	Nations (NIR)	direct emissions per sector (CRF)
	PRTR (Europe)	Industrial facilities	direct emissions of facility
Reporting (on voluntary basis)	GHG Protocol (WRI/WBCSD)	Companies	direct emissions of sources owned or controlled by companies (scope 1) + indirect emissions electricity (scope 2) + optional other indirect emissions (scope 3) no offsets
	IEAP (ICLEI)	Local governments	follows GHG Protocol
	EpE waste sector Protocoll (and ISWA White Paper)	Companies	direct, indirect emissions + avoided emissions
Documentation (marketing)	Carbon Footprint of Prod. (e.g. PAS 2050, ISO 14067)	Products	all emissions related to a product

Historical "real" GHG emissions as long as no offsets/avoided emissions are considered

PRTR _Pollutant Release and Transfer Register
 WRI _World Resource Institute
 WBCSD _World Business Council for Sustainable Development
 IEAP _International Local Government GHG Emission Analysis Protocol
 EpE _Entreprise pour l'Environnement

GHG market

Purpose	Method/Organisation	Level	GHG emissions
GHG market Carbon Trading	Kyoto Protocol CDM, JI (approved meth.) NAMA (meth. to be devel.)	Projects National progr.	reduced emissions by project reduced emissions by programme
	GHG Project Protocol (WRI/WBCSD)	Projects	mitigation projects (number of tools which can also be used for CDM)
	ISO 14064-2	Projects	emission reductions or removal enhancements

projects demand exact prediction/calulation of GHG reductions

-> Monitoring, Reporting, Verification (MRV)

GHG assessment

Purpose	Method/Organisation	Level	GHG emissions
Decision making, planning support	LCA (ISO 14040/14044)	Various	all emissions from cradle to grave (includes offsets)

Level / system boundary / calcuation of GHG emissions depend on goal and scope

GHG market

Purpose	Method/Organisation	Level	GHG emissions
GHG market Carbon Trading	Kyoto Protocol CDM, JI (approved meth.) NAMA (meth. to be devel.)	Projects National progr.	reduced emissions by project reduced emissions by programme
	GHG Project Protocol (WRI/WBCSD)		number of tools
	ISO 14064-2		

Focus workshop

- studies with LCA approach or use of Life Cycle Thinking
- different approaches of these studies
- possibilities to compare results

projects demand exact prediction/calculation
-> Monitoring, Reporting, Verification (MRV)

GHG assessment

Purpose	Method/Organisation	Level	GHG emissions
Decision making, planning support	LCA (ISO 14040/14044)	Various	all emissions from cradle to grave (includes offsets)

Level / system boundary / calculation of GHG emissions depend on goal and scope

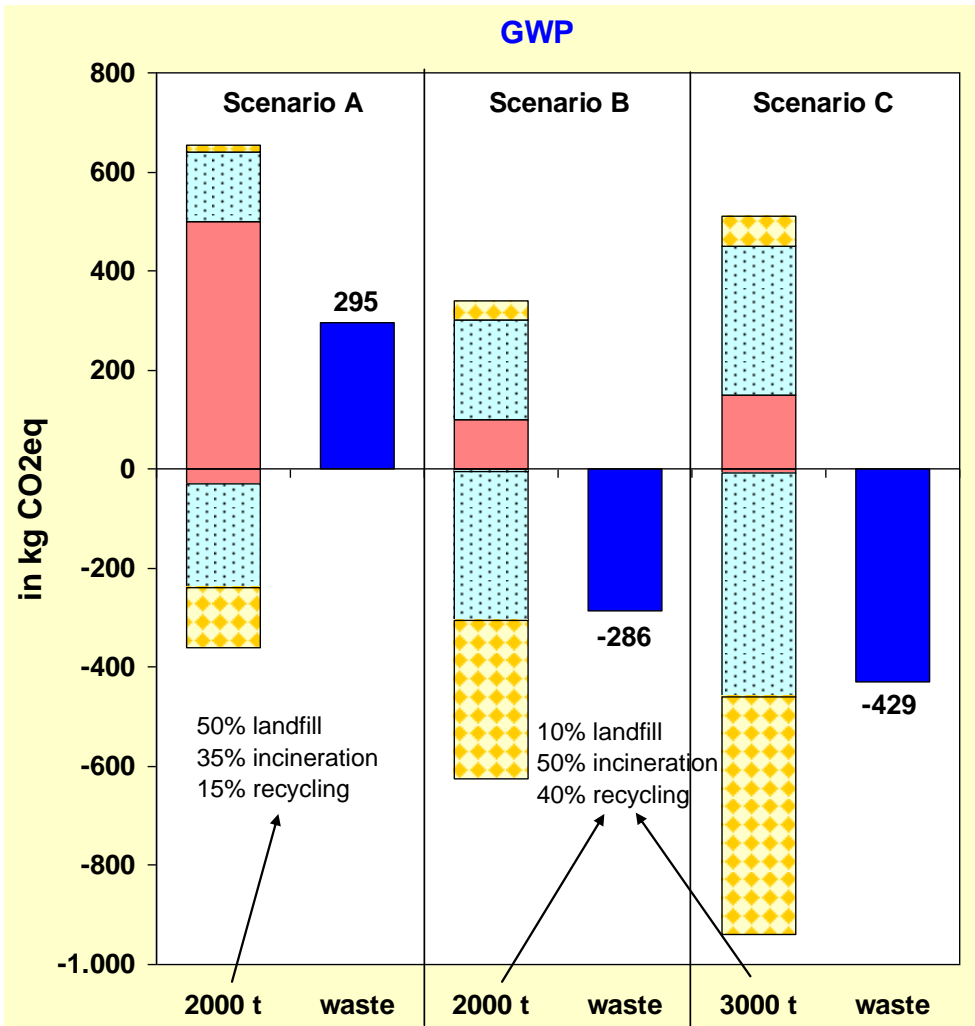
Mainly depend on

- system boundary / question to be answered (objective and scope)
- avoided processes chosen
- data used which are difficult to measure (e.g. landfill gas emissions)

Examples for questions determining system boundary

- Is treatment route / waste management system A better than B or C or ... ?
-> system comparison demands equal benefit of systems
- Show historic and (possible) future development of GHG emissions from waste management
-> has to consider yearly emissions and changes in waste volume, is not in compliance with LCA standard, cannot answer above mentioned questions
- what is the effect from waste prevention?
-> needs different system boundary because different question "how can I optimize the production system / national economy?"
(question of sustainable production & consumption, not of waste management)

Example for results depending on total waste volume



Same emission factors in A,B,C
(=same avoided processes)

Waste volume A = B
-> system comparison possible
B in favor of A due to change in
share of disposal options

Waste volume C > A,B
-> no system comparison
possible, only with system
expansion (production system)
Can be used to describe
development of total
emissions

10:50 - 11:30	Waste and GHG accounting: problems and possible solutions Thomas Christensen (TU Denmark)
11:30 - 12:00	MSW management and GHG modeling in Europe, EEA study 2011 Emmanuel Gentil (ETC/SCP)

12:00 - 13:00 **Lunch**

13:00 - 13:30	SWM and GHG, study in the US (2006) Susan Thorneloe (USEPA)
13:30 - 14:00	GHG mitigation potential, OECD study (2012) Adam Brundage (ICFI)
14:00 - 14:40	Comparing studies on SWM and GHG for the EU Cornelia Merz (Öko-Institut)

14:40 - 15:00 **Coffee break**

15:00 - 16:30 **Discussion**

16:30 - 17:00 **Summary and leave-taking**