Category		Title
NFR:	**6.A**	**Solid waste disposal on land**
SNAP:	**090401** **090402** **090403**	
ISIC:		
Version	**Guidebook 2009**	

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Contents

1 Overview

This chapter treats emissions from solid waste disposal on land. This source, however, is only a minor source of air pollutant emissions; emissions of greenhouse gases (CH_4, CO_2 and N_2O) are the major pollutants. Small quantities of non-methane volatile organic compounds (NMVOCs), NO_x, NH_3 and CO may be emitted, but there are no estimates available on the emission factors for these pollutants. Also, particulate emissions from waste handling are generated, but no emission factors are available.

2 Description of sources

2.1 Process description

Treatment and disposal of municipal, industrial and other solid waste causes emissions, mainly greenhouse gas emissions.

2.2 Techniques

No techniques are identified.

2.3 Emissions

Major emissions from waste disposal are emissions of greenhouse gases. Small quantities of NMVOC, CO, NH_3 and NO_x may be released as well. Particulate matter (PM) emissions are also emitted from waste handling, but no emission factors are available.

2.4 Controls

In many industrialised countries, waste management has changed much over the last decade. Waste minimisation and recycling/reuse policies have been introduced to reduce the amount of waste generated, and increasingly, alternative waste management practices to solid waste disposal on land have been implemented to reduce the environmental impacts of waste management. Also, landfill gas recovery has become more common as a measure to reduce CH_4 emissions from solid waste disposal sites (SWDS). More information with regard to this source can be found in the Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories (IPCC, 2006).

3 Methods

3.1 Choice of method

This section is omitted, since no emission estimates are provided for this source category. If, however, site-specific data are available and these meet with the criteria as described in the General Guidance Chapter 6 Inventory management, improvement and QA/QC, they can be used for the inventory.

3.2 Tier 1 default approach

3.2.1 Algorithm

The Tier 1 approach for process emissions from solid waste disposal uses the general equation:

$$E_{pollutant} = AR_{production} \times EF_{pollutant} \quad (1)$$

This equation is applied at the national level, using annual national total waste disposal.

The Tier 1 emission factors assume an averaged or typical technology and abatement implementation in the country and integrate all different sub-processes within this source category.

3.2.2 Default emission factors

No emission factors are available for this source. Small quantities of NMVOC and nitrate compounds are emitted. For NMVOC, US Environmental Protection Agency (USEPA) evaluates that 98.7 % of the landfill gas is methane and 1.3 % are other VOCs such as perchlorethylene, pentane, butane, etc. (USEPA, 1990). Also, PM emissions from waste handling are generated, but no estimate of emission factors is available.

Table 3-1 Tier 1 emission factors for source category 6.A Solid waste disposal on land

Tier 1 default emission factors					
	Code	Name			
NFR Source Category	6.A	Solid waste disposal on land			
Fuel	NA				
Not applicable	NOx, CO, SOx, Pb, Cd, As, Cr, Cu, Ni, Se, Zn, Aldrin, Chlordane, Chlordecone, Dieldrin, Endrin, Heptachlor, Heptabromo-biphenyl, Mirex, Toxaphene, HCH, DDT, PCB, PCDD/F, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Indeno(1,2,3-cd)pyrene, Total 4 PAHs, HCB, PCP, SCCP				
Not estimated	NMVOC, NH3, TSP, PM10, PM2.5, Hg				
Pollutant	**Value**	**Unit**	**95% confidence interval**		**Reference**
			Lower	**Upper**	
NMVOC	5.65	g/m3 landfill gas	3	11	UK Inventory (2004)

Information on estimates for greenhouse gas emissions is given in the 2006 IPCC Guidelines (IPCC, 2006).

3.2.3 Activity data

Not available.

3.3 Tier 2 technology-specific approach

Not available for this source.

3.4 Tier 3 emission modelling and use of facility data

Not available for this source.

4 Data quality

No specific issues.

5 References

IPCC (2006). 2006 IPCC Guidelines for National Greenhouse Gas Inventories, prepared by the National Greenhouse Gas Inventories Programme, Eggleston H.S., Buendia L., Miwa K., Ngara T. and Tanabe K. (eds). Published: IGES, Japan.

US EPA (1990). Air Emissions Species Manual, Volume 1: Volatile Organic Compounds Species profiles, second edition, EPA-4502-90-001a, United States Environmental Protection Agency, Office of Air Quality Planning and Standards, January 1990.

UK Inventory (2004). United Kingdom Air Pollutant Emission Inventory.

6 Point of enquiry

Enquiries concerning this chapter should be directed to the relevant leader(s) of the Task Force on Emission Inventories and Projection's expert panel on combustion and industry. Please refer to the TFEIP website (www.tfeip-secretariat.org/) for the contact details of the current expert panel leaders.