



Category	Title
NFR: 5.A	Biological treatment of waste - Solid waste disposal on land
SNAP: 090401 090402 090403	
ISIC:	
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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:

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

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

Table 3-1 presents the Tier 1 default particulate emission factors for solid waste disposal on land. These emission factors are calculated using equation 2 and default data described in subsection 3.3 of this present chapter (US EPA, 2006). Small quantities of NMVOC and nitrate compounds are also emitted. For NMVOC, US Environmental Protection Agency (US EPA) evaluates that 98.7 % of the landfill gas is methane and 1.3 % are other VOCs such as perchlorethylene, pentane, butane, etc. (US EPA, 1990).

Table 3-1 Tier 1 emission factors for source category 5.A Biological treatment of waste - Solid waste disposal on land

Tier 1 default emission factors					
	Code	Name			
NFR Source Category	5.A	Biological treatment of waste - Solid waste disposal on land			
Fuel	NA				
Not applicable	NO _x , SO ₂ , Pb, Cd, As, Cr, Cu, Ni, Se, Zn, PCB, PCDD/F, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Indeno(1,2,3-cd)pyrene, HCB, BC, HCH				
Not estimated	NH ₃ , Hg, CO				
Pollutant	Value	Unit	95% confidence interval		Reference
			Lower	Upper	
NMVOC	1.56	kg/Mg	0.5	3.0	UK Inventory (2004) [*]
TSP	0 463	g/Mg	0.006	2.21	US EPA (2006)
PM ₁₀	0 219	g/Mg	0.003	1.05	US EPA (2006)
PM _{2.5}	0 033	g/Mg	0.0004	0.16	US EPA (2006)

Notes: ^{*}UK Inventory (2004) refers to 5.65 g NMVOC per m³ landfill gas. According to US EPA (2006) chapter 2.4.4.1, the CH₄ generation potential can vary from 6 to 270 m³ per Mg waste, the default emission factor has been calculated by using the default CH₄ generation potential of 138 m³ per Mg waste and the default methane content of 50 % (IPCC, 2006, Vol. 5, Ch. 3.2.3).

Particulate uncertainty estimates are calculated as 'worst case' examples. The lower boundaries are calculated as wet fly ash (27 % moisture content (M)) at a wind speed of only 0.6 m/s (U). The upper boundaries are calculated as dry slag (3.6 % moisture content) at a wind speed of 6.7 m/s.

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

3.2.3 Activity data

The statistics required include the annual amount of landfilled waste. This information is available from the national statistics agencies, environmental agencies, or may be obtained through direct contact with the landfill site operators.