

5.B.1 - Biological Treatment of Waste: Composting

Short description

Within NFR category **5.B.1**, ammonia (NH₃) emissions from composting of organic wastes are reported.

NFR Code	Method	AD	EF
5.B.1	CS	NS	CS
Method(s) applied			
D	Default		
T1	Tier 1 / Simple Methodology *		
T2	Tier 2*		
T3	Tier 3 / Detailed Methodology *		
C	CORINAIR		
CS	Country Specific		
M	Model		
* as described in the EMEP/EEA Emission Inventory Guidebook - 2019, in category chapters.			
(source for) Activity Data			
NS	National Statistics		
RS	Regional Statistics		
IS	International Statistics		
PS	Plant Specific		
As	Associations, business organisations		
Q	specific Questionnaires (or surveys)		
M	Model / Modelled		
C	Confidential		
(source for) Emission Factors			
D	Default (EMEP Guidebook)		
CS	Country Specific		
PS	Plant Specific		
M	Model / Modelled		
C	Confidential		

NO _x	NM VOC	SO ₂	NH ₃	PM _{2.5}	PM ₁₀	TSP	BC	CO	Heavy Metals	POPs
NA	NA	NA	-/-	NA	NA	NA	NA	NA	NA	NA
L/- key source by Level only										
-/T key source by Trend only										
L/T key source by both Level and Trend										
-/- no key source for this pollutant										
IE emission of specific pollutant Included Elsewhere (i.e. in another category)										
NE emission of specific pollutant Not Estimated (yet)										
NA specific pollutant not emitted from this source or activity = Not Applicable										
* no analysis done										

Separately collected organic waste (biowaste) from e.g. households, public garden and park service, food industry, restaurants, canteens and from agriculture can be treated either (i) aerobically (= composting) or (ii) anaerobically (= biogas production).

The aim of the treatment reported under this category is the production of compost, leading to the recycling of nutrients and organic matter.

The produced compost is used as fertilizer or soil improver in agriculture or horticulture and also in private gardening.

In Germany about 50% of the organic waste is treated in composting plants and ammonia (NH₃) is an important emission to air.

Method

Emissions from composting are not a key source and of minor priority.

Activity Data

Official statistical data (Statistisches Bundesamt, GENESIS, Table Nr. 32111-0003 - Erhebung der Abfallentsorgung; ¹⁾) are used for the estimation.

The data are published annually with an exception for the current year of reporting. Therefore, activity data for the current year of reporting are obtained, initially, by extrapolating the trend of the last 3 years. In the following year, when the actual activity data for the given year becomes available, they replace the extrapolated data. This procedure has only a very small impact on the total emissions in the relevant current report year.

Emission factors

The emission factor used for calculating NH₃ emissions is based on emission data from a research project ²⁾. The NH₃-EF is 222 g/t and used for the whole time series. The use of abatement technologies (such as biofilters) are taken into account.

Uncertainties

The AD from Statistisches Bundesamt have an uncertainty of $\pm 2\%$ whereas the uncertainty for the EF is -59/+130% (ibid.).

Recalculations

When preparing the current inventory data, statistical data are only available for the previous reporting year. The current reporting year must therefore be extrapolated on the basis of the previous year. The result of this approach is revised by the correct data in the following year. For this reason, annual recalculations are required for the previous year.

Table 1: Revised biowaste activity data, in [kt]

	2022
current submission	8,174
previous submission	9,092

Table 2: Accordingly revised NH₃ emissions, in [t]

	2022
current submission	1,815
previous submission	2,018



For **pollutant-specific information on recalculated emission estimates for Base Year and 2022**, please see the recalculation tables following [chapter 8.1 - Recalculations](#).

Planned improvements



At the moment, no category-specific improvements are planned.

¹⁾ Statistisches Bundesamt, GENESIS, Table Nr. 32111-0003 - Erhebung der Abfallentsorgung; Wiesbaden;
<https://www-genesis.destatis.de/genesis//online?operation=table&code=32111-0003&bypass=true&levelindex=0&levelid=1630573034654#abreadcrumb>

²⁾ Carsten Cuhls, Birte Mähl, Joachim Clemens; gewitra Ingenieurgesellschaft für Wissenstransfer mbH: Ermittlung der Emissionssituation bei der Verwertung von Bioabfällen;
<https://www.umweltbundesamt.de/publikationen/ermittlung-der-emissionssituation-bei-der>; im Auftrag des Umweltbundesamtes, April 2015