

## 5.D.2 - Industrial Wastewater Handling

### Short description

Category Code	Method	AD	EF											
5.D.2	T1	NS	D											
<b>Method(s) applied</b>														
<b>D</b>	Default													
<b>T1</b>	Tier 1 / Simple Methodology *													
<b>T2</b>	Tier 2*													
<b>T3</b>	Tier 3 / Detailed Methodology *													
<b>C</b>	CORINAIR													
<b>CS</b>	Country Specific													
<b>M</b>	Model													
* as described in the EMEP/EEA Emission Inventory Guidebook - 2019, in category chapters.														
<b>(source for) Activity Data</b>														
<b>NS</b>	National Statistics													
<b>RS</b>	Regional Statistics													
<b>IS</b>	International Statistics													
<b>PS</b>	Plant Specific													
<b>As</b>	Associations, business organisations													
<b>Q</b>	specific Questionnaires (or surveys)													
<b>M</b>	Model / Modelled													
<b>C</b>	Confidential													
<b>(source for) Emission Factors</b>														
<b>D</b>	Default (EMEP Guidebook)													
<b>CS</b>	Country Specific													
<b>PS</b>	Plant Specific													
<b>M</b>	Model / Modelled													
<b>C</b>	Confidential													
<b>NO<sub>x</sub></b>	<b>NM VOC</b>	<b>SO<sub>2</sub></b>	<b>NH<sub>3</sub></b>	<b>PM<sub>2.5</sub></b>	<b>PM<sub>10</sub></b>	<b>TSP</b>	<b>BC</b>	<b>CO</b>	<b>Pb</b>	<b>Cd</b>	<b>Hg</b>	<b>Diox</b>	<b>PAH</b>	<b>HCB</b>
-	-/-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>L/-</b> key source by <b>Level</b> only														
<b>-/T</b> key source by <b>Trend</b> only														
<b>L/T</b> key source by both <b>Level</b> and <b>Trend</b>														
<b>-/-</b> no key source for this pollutant														
<b>IE</b> emission of specific pollutant <b>Included Elsewhere</b> (i.e. in another category)														
<b>NE</b> emission of specific pollutant <b>Not Estimated</b> (yet)														
<b>NA</b> specific pollutant not emitted from this source or activity = <b>Not Applicable</b>														
* no analysis done														

In category **5.D.2**, NM VOC emissions from industrial wastewater handling are reported. The industrial section is covered by wastewaters from industrial processes. Main sectors are chemical industries, iron & steel industries, power generation, Food sector, Paper & Cardboard-production and "Other"-Industrial processes.

### Method

Emissions reported under this category are calculated using the Tier 1 approach of the EMEP/EEA Guidebook 2019, where the emission factor (EF) is 15 mg/m<sup>3</sup> wastewater (Part B, 5.D, chap. 3.2.2, Table 3-1, p. 7<sup>1)</sup>). This EF is multiplied with the total amount of wastewater (AD) treated in industrial wwt-plants, following the equation:





**Emissions**  $_{NMVOC} = AD \times EF$   
(ibid., chap. 3.2.1)

## Activity data

Total volumes of treated industrial wastewater are derived by the German statistical agency (Statistisches Bundesamt, Umweltnutzung und Wirtschaft. Tabellen zu den Umweltökonomischen Gesamtrechnungen. Teil 4: Wassereinsatz, Abwasser. Table 7.7 <sup>2)</sup>). The availability of the data starts in 1991 with new data for every following year, until 2001. Until then the data source is published on a three-year basis with new data only for the respective year of the update. Missing data are interpolated. Since the Wastewaterstatistic has not been updated since 2016, the data for Chemical Industry and Paper&Cardboard has been extrapolated until 2017 on the basis of an expert judgment, assuming for the Chemical Industry a yearly reduction of 1% and for Paper&Cardboard of 1,5%. For the remaining industries expert-judgement concluded that constant values since 2016 are deemed to be most probable.

## Emission factors

See method.

It should be noted that the described default emission factor was collected in Turkey for municipal wastewater treatment plants under specific climatic conditions in developing countries. The wastewater characteristics of the considered industries sometimes differ significantly from municipal wastewater.

## Uncertainties

The AD from Statistisches Bundesamt have an uncertainty of  $\pm 3\%$  (normal distribution) whereas the uncertainty for the EF, due to its range (5/50 mg/m<sup>3</sup>), is -70 / +210 % and the distribution lognormal.

## Recalculations

As given above, the activity data for Chemical Industry and Paper & Cardboard have been recalculated according to the following tables:

Table 1: Revised volume of treated wastewater, in [m<sup>3</sup>]

		2017	2018	2019	2020
Chemical Industry	<b>current submission</b>	254,395,036	251,851,086	249,332,575	246,839,249
	<b>previous submission</b>	256,964,683	256,964,683	256,964,683	256,964,683
Paper & Cardboard Sector	<b>current submission</b>	196,996,966	194,042,012	191,131,382	188,264,411
	<b>previous submission</b>	199,996,920	199,996,920	199,996,920	199,996,920

Table 2: Revised TOW, in [kt]

	2017	2018	2019	2020
<b>current submission</b>	1.337	1.323	1.310	1.296
<b>previous submission</b>	1.350	1.350	1.350	1.350

Table 3: Accordingly revised NMVOC emissions, in [kt]

	2017	2018	2019	2020
<b>current submission</b>	12.9152306	12.8327471	12.7513100	12.6709055
<b>previous submission</b>	12.9987747	12.9987747	12.9987747	12.9987747



For **pollutant-specific information on recalculated emission estimates for Base Year and 2020**, please see the recalculation tables



following [chapter 8.1 - Recalculations](#).

## Planned improvements

Currently no improvements are planned.

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<sup>1)</sup> EMEP/EEA, 2019: EMEP/EEA air pollutant emission inventory guidebook 2019, Copenhagen, 2019

<sup>2)</sup> Statistisches Bundesamt, Umweltnutzung und Wirtschaft. Tabellen zu den Umweltökonomischen Gesamtrechnungen. Teil 4: Wassereinsatz, Abwasser. Table 7.7