2.A.5.b - Construction and Demolition

Short description

Category Code	Method					AD					EF				
2.A.5.b	T1					NS					CS				
	NO$_x$	NMVOC	SO$_2$	NH$_3$	PM$_{2.5}$	PM$_{10}$	TSP	BC	CO	Pb	Cd	Hg	Diox	PAH	HCB
Key Category:	-	-	-	-	-/-	L/T	L/-	-	-	-	-	-	-	-	-

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

For particulate emissions, Construction is the second main emissions source in the Mineral industries.

Methodology

Since the last update of the UNECE Guidebook we use the Tier 1 method to estimate the national emissions of particulate matters. The approach for uncontrolled fugitive emissions for this source category was adapted for national circumstances within a research Project (Umweltbundesamt, 2016) [1], partly considered exiting control techniques. As a result, the information of the statistics is combined with modified default emission factors for TSP and PM.

Activity data

Activity data are determined taking into account figures for various construction activities. Data is based on production statistics (national statistics). According to the method used, figures of area of land affected by construction activities per building were concluded from statistical data and multiplied with emission factors, as explained below. The common uncertainty of 3% for national statistics could be increased as a result of this calculation, but the effect is not estimated at the moment.

Emission factors

The emission factors used are results of Adaptation of UNECE-Defaults (EEA, 2016) [2], see chapter NFR 2.A.5.b for different kind of buildings.

Table 1: Overview of apllied emission factors, in [kg / m^2 * y]

Kind of building	Pollutant	EF value	EF trend
single and two family houses	TSP	0.0638	constant
single and two family houses	PM$_{10}$	0.0191	constant
single and two family houses	PM$_{2.5}$	0.0019	constant
apartment buildings	TSP	0.329	constant
apartment buildings	PM$_{10}$	0.099	constant
apartment buildings	PM$_{2.5}$	0.0099	constant
non-residential	TSP	0.631	constant
non-residential	PM$_{10}$	0.189	constant
non-residential	PM$_{2.5}$	0.0189	constant
roads	TSP	1,674	constant
roads	PM$_{10}$	502	constant
roads	PM$_{2.5}$	50.2	constant

Several further assumptions were necessary to use the formula of the Guidebook:

$$EM = EF * B * f * m$$

The EF is adapted with Moisture Level Correction factor and Silt Content Correction factor in all cases, both 0.20 and 2.22. The assumption about the duration of the construction activity uses the Default values (EEA, 2016)[3]:

| Type of building	Estimated duration (year)
Construction of houses (single and two family)	0.5 (6 months)
Construction of apartments (all types)	0.75 (9 months)
Non-residential construction	0.83 (10 months)
Road construction	1 (12 months)

AD is a result of multiplying B the number of houses constructed and f the conversion factor.

Trends in emissions

All trends in emissions as product of EF and AD correspond to trends of construction activities.

Trends of Emissions of construction and demolition

Emissions by pollutant / Emissionen nach Schadstoff

Emission trends in NFR 2.A.5.b
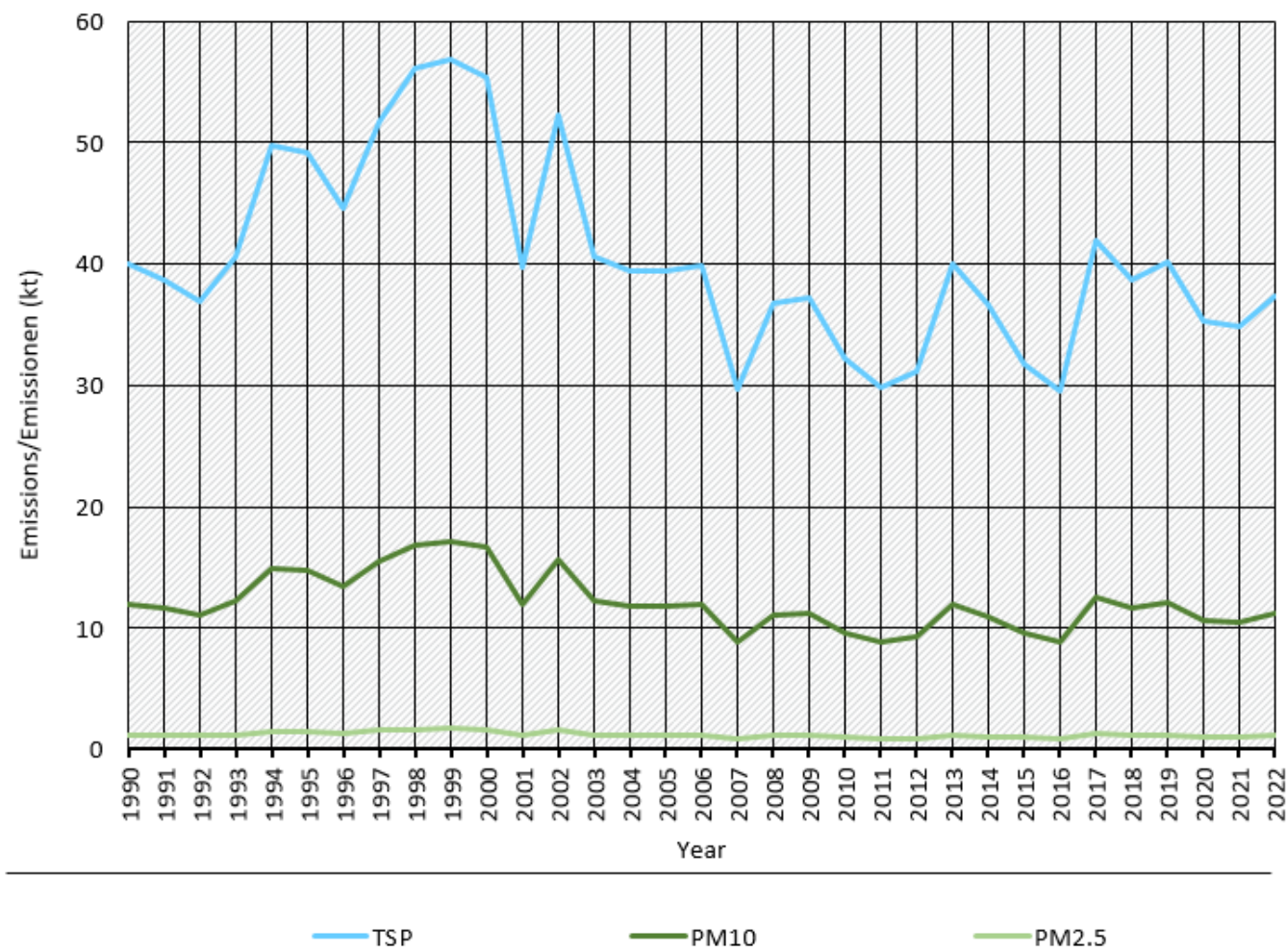
* Base Year for PM = 1995 / Basisjahr für Feinstäube (PM) ist 1995

Quelle: German Environment Agency, National inventory for the German reporting on atmospheric emissions since 1990, (01/2024)

Recalculations

With **activity data** and **emission factors** remaining unrevised, no recalculations have been carried out compared to last year's submission.

> For **pollutant-specific information on recalculated emission estimates for Base Year and 2019**, please see the pollutant specific recalculation tables following chapter 8.1 - Recalculations.

Planned improvements

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

FAQs

Where can I find emissions estimation of demolition activities? - Demolishing without any significant new construction is not covered and there are no other emission factors available for demolition activities only. Nevertheless you can find Information about emissions from 5.E.2 - Other Waste: Building Fires.

Why do German EFs differ from EEA defaults? - It has to do with the default 50% reduction for non-residential buildings and roads (as a result of wetting unpaved temporary roads) that is assumed in the calculations for Germany. This is also already accounted for in the EPA emission factors. It is a result of a control measure that is nearly always taken but in principle optional. In the Guidebook a 50% reduction is advised.

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[1] Umweltbundesamt, 2016: Development of Methods for the Generation of Emission Data for Air Pollutants from Building Activity and Construction Zones, Dessau-Roßlau, 2016 FILE?

[2,3] EEA, 2016: EEA Report No 21/2016 EMEP EEA air pollutant emission inventory guidebook 2016, Copenhagen, 2016; https://www.eea.europa.eu/ds_resolveuid/EJ6RT9P2Y3