2.A.5.b - Construction and Demolition

Short description

Category Code	Method	AD	EF
2.A.5.b	T1	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	NMVOC	SO_2	NH_3	**$PM_{2.5}$**	**PM_{10}**	**TSP**	BC	CO	Heavy Metals	POPs
NA	NA	NA	NA	-/-	**L/T**	**L/-**	NA	NA	NA	NA

L/-	key source by **L**evel only
-/T	key source by **T**rend only
L/T	key source by both **L**evel and **T**rend
-/-	no key source for this pollutant
IE	emission of specific pollutant **I**ncluded **E**lsewhere (i.e. in another category)
NE	emission of specific pollutant **N**ot **E**stimated (yet)
NA	specific pollutant not emitted from this source or activity = **N**ot **A**pplicable
*	no analysis done

With respect to particle emissions, construction is the second main emissions source in the Mineral industries.

Methodology

Since the last update of the UNECE Guidebook, a Tier 1 method is applied to estimate particulate matter emissions.

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
	PM_{10}	0.0191	constant
	$PM_{2.5}$	0.0019	constant
apartment buildings	TSP	0.329	constant
	PM_{10}	0.099	constant
	$PM_{2.5}$	0.0099	constant
non-residential	TSP	0.631	constant
	PM_{10}	0.189	constant
	$PM_{2.5}$	0.0189	constant
roads	TSP	1,674	constant
	PM_{10}	502	constant
	$PM_{2.5}$	50.2	constant

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

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

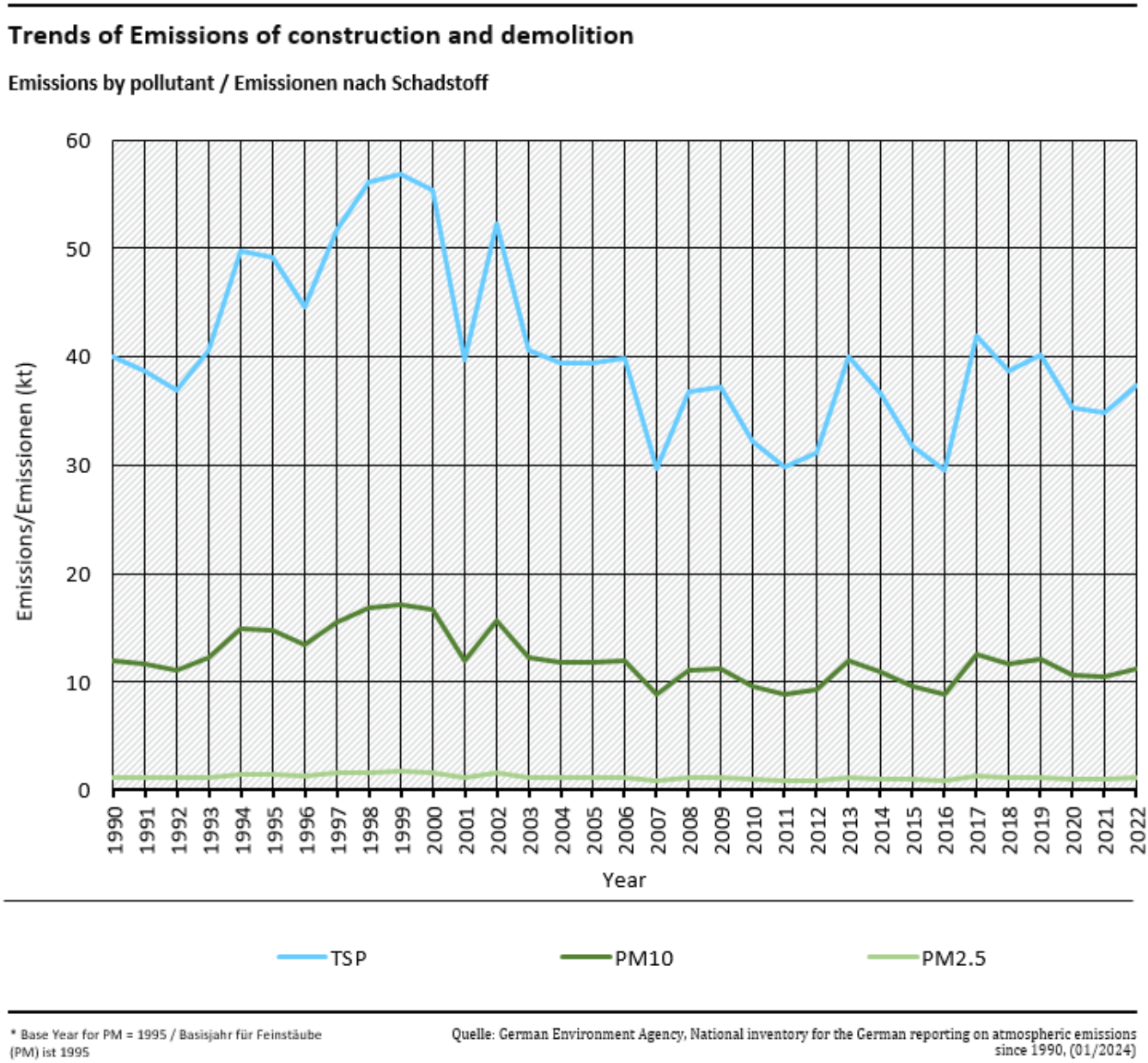
The EF is adapted with Moisture Level Correction factor and Silt Content Correction factor in all cases, both 0.20 and 2.22. The assumption about the duration of the construction activity uses the Default values (EEA, 2016)[3)]:

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.



Emission trends in NFR 2.A.5.b

Recalculations

With **all input data remaining unrevised**, no recalculations were made compared to the previous submission.

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.

[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