2.A.5.a - Quarrying & Mining - Other Than Coal

Category Code	Method					AD					EF				
2.A.5.a	T1					IS					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/-	L/T	L/-	-	-	-	-	-	-	-	-

T = key source by Trend **L** = key source by Level

Methods	
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 the group specific chapters.

AD - Data Source for Activity Data	
NS	National Statistics
RS	Regional Statistics
IS	International Statistics
PS	Plant Specific data
As	Associations, business organisations
Q	specific Questionnaires (or surveys)
M	Model / Modelled
C	Confidential

EF - Emission Factors	
D	Default (EMEP Guidebook)
C	Confidential
CS	Country Specific
PS	Plant Specific data
M	Model / Modelled

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

In Germany we use two approaches - one for Sands and rocks, one for salts.

Short description - Sands and Rocks

The mining process emits relevant amounts of particles. Quarrying and mining of minerals other than coal is subsumed, in particular mining of limestone, hard rock and building Sands, with rising recycled materials.

Methodology

With the use of the 2019 GB method [1)], a Tier 2 method is available that can reflect different national conditions.

In particular, this concerns input variables on humidity and wind speed, which are differentiated into regions. Due to data availability, the regions are represented by the administrative states (German Länder), which does not necessarily represent characteristic weather regimes. Regionality can be increased by merging urban and surface states. Parameters on weather as well as on areas can thus be improved.

The temporal resolution of the regional parameters has limitations: no weather data reports are available on a station basis before 2010, so no area information from the Corine land cover before 2010 is used (consistent data sets). In addition,

information from CLC category 131 (Mineral extraction sites [2]) had to be adjusted for areas of active open-pit lignite mines.

Activity Data

As provided for in the GB model, we use AD in the split hard rock, sand and recycled material. These AD are taken from association information because the national statistics are not complete [3]. Data gaps are interpolated for time series concsistency. The application of the method therefore resulted in higher AD.

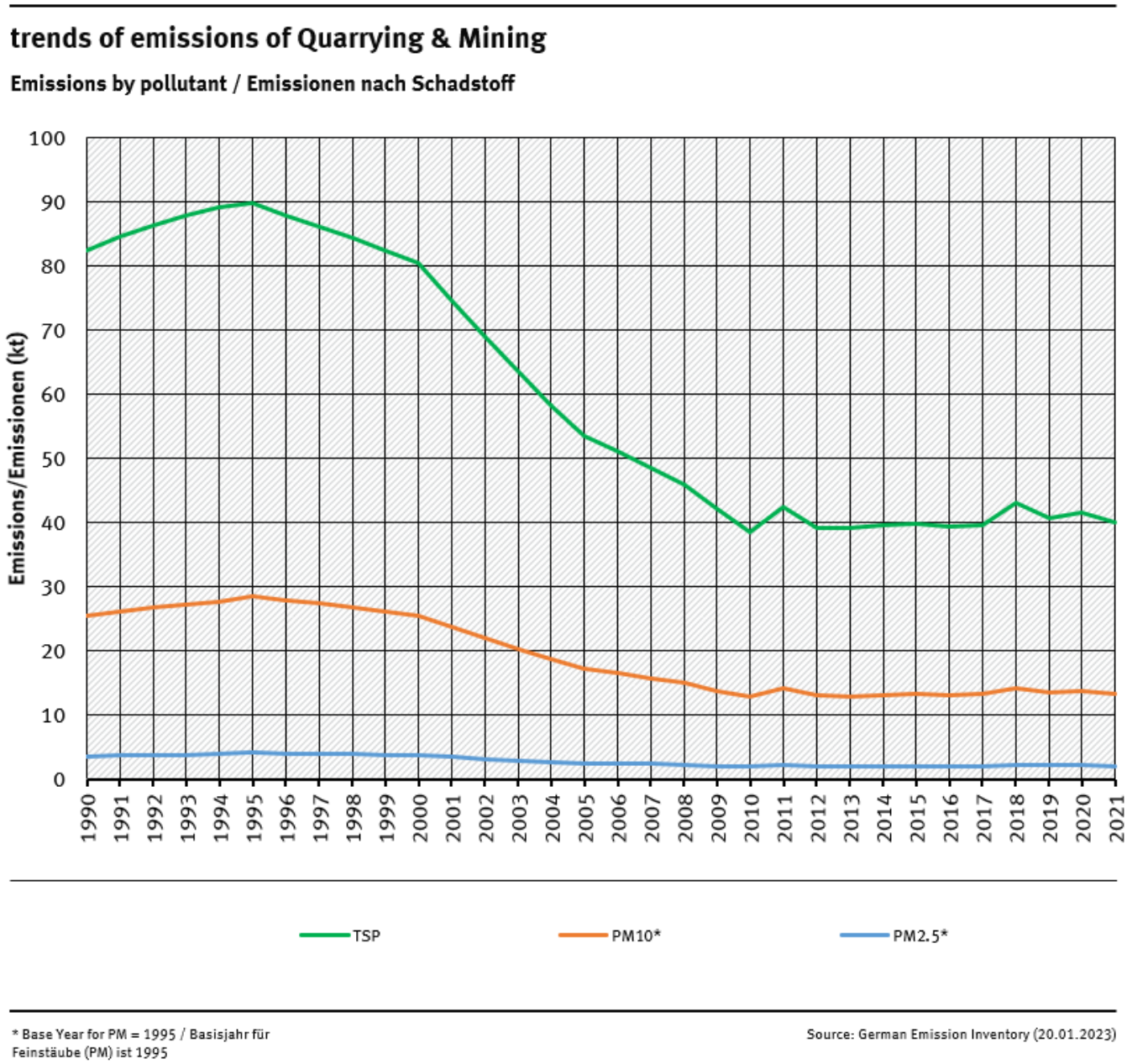
Emission factors

The calculation of emissions takes into account national circumstances and reduction measures.The calculations are available in total more than ten Excel files (individual years since 1990, annually from 2010). Since the GB tool in principle calculates emissions for exactly one year [4], files must be available for exactly those years in which input data are available. Intermediate years are interpolated in case of data gaps.

With the help of the GB tools, IEFs are estimated on an annual basis, which are used for the inventory method AR x EF. The emission factors are virtual, but the calculation of this is modified by national circumstances on the parameters. So we would name the EF as country-specific.

Trend discussion

Trends in emissions follow the shrinking mining activities.



Emission trends in NFR 2.A.5.a

Recalculations

Recalculations were necessary due to revised emissions model parameters for the whole time. Because of the particular weather sensitivity of the model, there are years with higher emissions, which is not counterbalanced by reductions from the area correction. There are changes for the years 1990 to 2009 because of the corrected area data, without specific modeling. The changed weather data can be found in the data set for the adjustment of all years starting in 2010.

emissions NFR category 2A5a

Absolute changes compared to last year's submission

Quelle: German Environment Agency, National inventory for the German reporting on atmospheric emissions since 1990, Emissions from 1990 to 2019 (final version of 02/2022)

Recalculations in NFR 2.A.5.a

Planned improvements

At the moment, it is planned evaluate further Country specific conditions.

Short description - Salt Production

Salt production is a sub-category of the mining activities in respect of the country specific approach used. Currently, a Tier 1 method is used: information on production of salts are multiplied with emission factors for TSP and PM.

Method

Activity data

The data from national statistics includes production of potash and rock salt. Potash salt is dominating, nevertheless gaps of statistics are filled and emissions are modelled as potash salt only.

Emission factors

The emission factors are based on analogy to bulk product handling by an UBA expert judgement:

Table 2: Overview of applied emission factors, in kg/t salt

	EF value	EF trend
TSP	0.031	constant
PM_{10}	0.016	constant
$PM_{2.5}$	0.003	constant

Recalculations

For **pollutant-specific information on recalculated emission estimates for Base Year and 2020**, please see the pollutant specific recalculation tables following chapter 8.1 - Recalculations.

Planned improvements

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

[1)] EMEP/EEA, 2019: EEA Report No 13/2019 EMEP EEA air pollutant emission inventory guidebook 2019, Copenhagen, 2019; URL: https://www.eea.europa.eu/publications/emep-eea-guidebook-2019/part-b-sectoral-guidance-chapters/2-industrial-processes/2-a-mineral-products/2-a-5-a-quarrying/view

[2)] Copernicus 2019: CLC-classes; URL: https://land.copernicus.eu/user-corner/technical-library/corine-land-cover-nomenclature-guidelines/html/index-clc-131.html

[3)] European Industry Association data are published annually at https://uepg.eu/pages/figures. Within the framework of technical consultations, historical data were confirmed by the National Association for Mineral Resources (https://www.bv-miro.org/).

[4)] EMEP/EEA, 2019: EEA Report No 13/2019 EMEP EEA air pollutant emission inventory guidebook 2019, Copenhagen, 2019; URL: https://www.eea.europa.eu/publications/emep-eea-guidebook-2019/part-b-sectoral-guidance-chapters/2-industrial-processes/2-a-mineral-products/2-a-5-a-quarrying-1/view