

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

| Category Code | Method          |                 |                 |        |    | AD |    |    |    |      | EF  |     |     |                  |                   |
|---------------|-----------------|-----------------|-----------------|--------|----|----|----|----|----|------|-----|-----|-----|------------------|-------------------|
| 2.A.5.a       | T1              |                 |                 |        |    | IS |    |    |    |      | CS  |     |     |                  |                   |
| Key Category  | SO <sub>2</sub> | NO <sub>x</sub> | NH <sub>3</sub> | NM VOC | CO | BC | Pb | Hg | Cd | Diox | PAH | HCB | TSP | PM <sub>10</sub> | PM <sub>2.5</sub> |
| 2.A.5.a       | -               | -               | -               | -      | -  | -  | -  | -  | -  | -    | -   | -   | L/- | L/T              | L/-               |

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

| Methods   |                                 |
|-----------|---------------------------------|
| <b>D</b>  | Default                         |
| <b>RA</b> | Reference Approach              |
| <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/CORINAIR Emission Inventory Guidebook - 2007, in the group specific chapters.

| AD - Data Source for Activity Data |                                      |
|------------------------------------|--------------------------------------|
| <b>NS</b>                          | National Statistics                  |
| <b>RS</b>                          | Regional Statistics                  |
| <b>IS</b>                          | International Statistics             |
| <b>PS</b>                          | Plant Specific data                  |
| <b>AS</b>                          | Associations, business organisations |
| <b>Q</b>                           | specific questionnaires, surveys     |
| EF - Emission Factors              |                                      |
| <b>D</b>                           | Default (EMEP Guidebook)             |
| <b>C</b>                           | Confidential                         |
| <b>CS</b>                          | Country Specific                     |
| <b>PS</b>                          | Plant Specific data                  |

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.

noch zu verwenden: Regionalität: wegen der Bedeutung der Regionalität statt Administration Zusammenführung von Stadt- und Flächenstaaten bei Wetter und Flächen? Test: geringe Abweichungen waren erkennbar, aber unvermeidlich, weil Wetterdaten hier teilweise revisionsbedürftig und kaum als Mittel darstellbar. verwendet für die Anpassung der Datensätze im Jahrestool wurden (Datenübernahme):

Flächen im Zeitverlauf: Die Abbaufächen ändern sich im Zeitverlauf, aber rückwirkend liegen nicht alle Daten vor. → Die zeitlichen Verläufe werden grob durch die bekannten Abbaumengen abgebildet. → Vor 2010 liegen auch keine DWD-Datenauswertungen vor, was konsistent sein muss. → Das Auslaufen der BK-Tagebaue hat durch die erfolgte Flächenbereinigung keine Auswirkung. → Erst bei Verwendung eines neuen, aktuelleren CLC-Datensatzes müsste die Bereinigung neu erfolgen, weil BK-Tagebaue wegfallen. 1. Fazit für die zu erwartenden Rekalkulationen Wegen der besonderen Wettersensitivität des Modells wird es Jahre mit höheren Emissionen geben, was nicht durch Verringerungen aus der Flächenkorrektur ausgeglichen wird. Es gibt wegen der korrigierten Flächendaten Änderungen für die Jahre 1990 bis 2009, ohne dass diese spezifisch modelliert wurden. Alle Änderungen entspringen einer Verbesserung im Rahmen nationaler Anpassungen und sind begründbar. Die geänderten Daten sind im Datensatz für die Anpassung aller Jahre 2010 ff. zu finden. 2. Anpassung aller Jahre 2010 ff. Mit den konsolidierten Wetter- und Flächendaten sind keine Jahre vor 2010 modellierbar, weil diese Datenmenge nicht verfügbar ist.

### 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 <sup>1)</sup>, 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 twelve regions.

## 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 <sup>2)</sup>. Data gaps are interpolated for time series consistency. 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 <sup>3)</sup>, files must be available for exactly those years in which input data are available. Intermediate years are interpolated in case of data gaps.

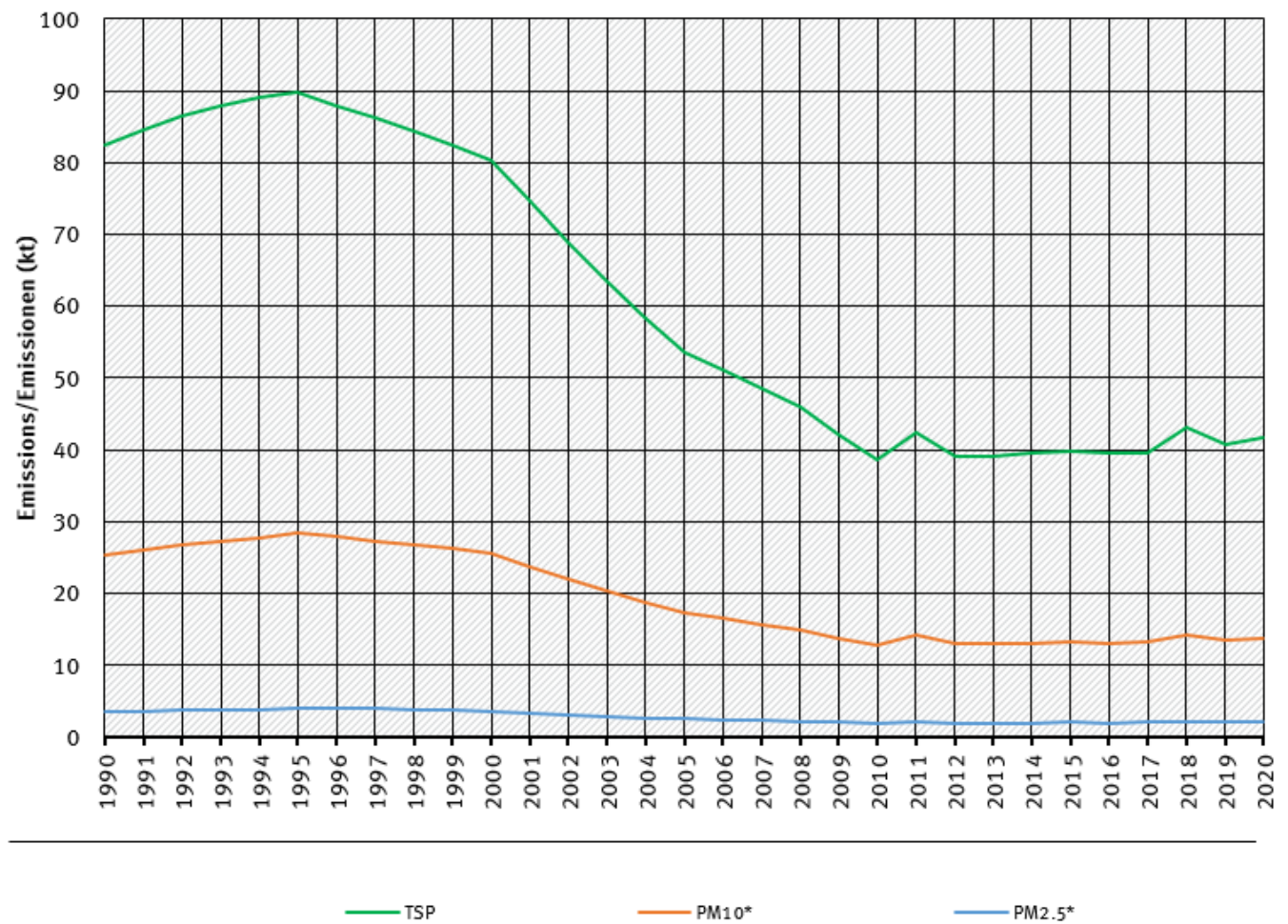
With the help of the GB tools, IEFs are estimated on an annual basis, which are used for the inventory method  $AR \times EF$ . The emission factors are virtual, but the calculation of this is modified by national circumstances on the parameters. So we would name the EF as country-specific.

## Trend discussion

Trends in emissions follow the shrinking mining activities.

## trends of emissions of Quarrying & Mining

Emissions by pollutant / Emissionen nach Schadstoff



\* Base Year for PM = 1995 / Basisjahr für Feinstäube (PM) ist 1995

Source: German Emission Inventory (03.12.2021)

Emission trends in NFR 2.A.5.a

## Recalculations

Recalculations were necessary due to revised emissions model parameters for the whole time.

## 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 expert judgements from UBA:

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

| Pollutant         | EF value | EF trend |
|-------------------|----------|----------|
| TSP               | 0.031    | constant |
| PM <sub>10</sub>  | 0.016    | constant |
| PM <sub>2.5</sub> | 0.003    | constant |

## Planned improvements

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

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<sup>1)</sup> 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>

<sup>2)</sup> 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/>).

<sup>3)</sup> 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>