2.A.6 - Other Mineral Products: Ceramics

Short description

Method	AD	EF	Key Category
T1	NS	CS	**L**: TSP

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

The NFR category 2.A.6 (other) is not comparable with the CRF structure. So the CRF category 2.A.4.a Ceramics production includes the same figures. Information about the key source relevance can be found in 2.A - Mineral Industry.

The ceramics industry in Germany is very heterogeneous. It involves a large number of products that are characterized by different fields of application and corresponding chemical compositions. In addition to clay (as the main raw material), sand and other natural raw material amounts, synthetically produced materials such as aluminium oxide and silicon dioxide are also used. The mixture, which is homogenously mixed from primary raw materials and only in small quantities of secondary raw materials, is burned mainly in tunnel kilns and hearth furnaces at kiln temperatures between 1,100 - 1,300°C.

Method

In contrast to carbon dioxide, emissions of air pollutants are calculated using only the Tier 1 method, since no product-specific data are available and this source category is not a key source. In relation to the quantity produced, bricks and refractory products as well as wall and floor tiles are important.

Activity data

For submission in 2018, the production figures (activity rates) were evaluated as completely as possible by the Federal Statistical Office. In order to complete the data available, the annual production of each product category was determined in the context of an expert study in cooperation with the Federal Statistical Office (J. Gottwald et al., 2017) [1]. Data from the

Federal Statistical Office are available in different units (tonnes, square metres, pieces, value) depending on the product. In order to ensure consistent processing of the data, it is necessary to standardize the dimensions in tonnes by using conversion factors. The conversion factors for facing bricks, backing bricks and roof tiles are calculated differently. On information provided by the Bundesverband der Deutschen Ziegelindustrie e. V. this calculation in respect of technical discussions were fundamentally revised. Up to now, for the conversion of the volume data of the official statistics for the whole time series an average value for the gross density from 1994 is used. Now new average values for the bulk density of backing bricks for the year 2016 (BV Ziegel, 2019). The bulk density has increased over time since 1994 has fallen steadily, which is due to the increase in the proportion of well-insulating lightweight bricks. The Values for raw densities for the years between 1994 and 2016 were interpolated linearly. The brick product group has by far the largest share in the ceramic Total production. A review of the methodology for the other sectors of ceramic industry was not necessary.

Emission factors

Process-related emissions originate in the raw materials for production (normally, locally available loams and clays with varying concentrations of organic impurities and specific raw material mixes). Some EF are documented in detail in a report of a research Project (Stein, Gronewäller, 2010) [2] taking into account information of industry monitoring. Other EF are based on an expert judgements from UBA due to lack in EMEP/EEA air pollutant emission inventory guidebook.

Table 1: Overview of applied emission factors, in kg/t

Pollutant	Name of category	EF value	EF trend
NO_x	all ceramics	0.177	constant
SO_2	all ceramics	0.10	constant
NMVOC	all ceramics	0.008	falling
NH_3	all ceramics	0.004	constant
TSP	all ceramics	0.10	falling
PM_{10}	all ceramics	0.08	falling
$PM_{2.5}$	all ceramics	0.05	falling

Discussion of emission trends

> Advice for NFR-tables: The steep reduction for TSP and SO_2 from 1990 to 1991 is not result of ceramic Industry: The source for emissions data of year 1990 for eastern Germany is in cases of TSP and SO_2 the last statistic of the GDR for Mineral products and allocated at 2A6-level.

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Emission trends of NFR 2.A.6

Recalculations

Recalculations were necessary due to revised AD of some products resulting in lower amounts since year 1996.

> For pollutant-specific information on recalculated emission estimates for Base Year and 2018, please see the pollutant specific recalculation tables following chapter 8.1 - Recalculations.

Planned improvements

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

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[1] J. Gottwald et al., 2017: Prüfung der Vollständigkeit der Berichterstattungskategorie 'Keramische Erzeugnisse' insbesondere feinkeramische Erzeugnisse, Dessau-Roßlau, 2017;
https://www.umweltbundesamt.de/sites/default/files/medien/1968/publikationen/2017-01-19_dokumentationen_01-2017_emi

ssionsrelevanz-feinkeramikbranche.pdf | Document (PDF)

[2] Stein, Gronewäller, 2010: Aufbereitung von Daten der Emissionserklärungen gemäß 11. BImSchV aus dem Jahre 2004 für die Verwendung bei der UNFCCC- und UNECE-Berichterstattung
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