5.C.1.b v - Cremation

Category Code	Method				AD					EF				
5.C.1.b.v	CS				AS					D, CS				
Key Category	**SO_2**	**NO_x**	**NH_3**	**NMVOC**	**CO**	**BC**	**Pb**	**Hg**	**Cd**	**Diox**	**PAH**	**HCB**	**TSP**	**PM_{10}**	**$PM_{2.5}$**
5.C.1.b.v	-/-	-/-	-	-/-	-/-	-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-	-/-

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

Method

Emissions from cremation are not a key source and of minor priority. Since March 1997, a national legal ordinance for cremation plants nationwide is in force (27. BImSchV).

Activity data

Activity data for this category are based on data from the statistics of the “Bundesverband Deutscher Bestatter e.V.”[1]. For purposes of GHG reporting we specify cremations as masses, too. The cremation is a growing trend in funerals.

Emission factors

Emission factors used are default values from the EMEP/EEA air pollutant emission inventory guidebook 2016 [2] as well as new national data for POPs from the research project “POP- und Hg-Emissionen aus abfallwirtschaftlichen Anlagen” - Teilvorhaben zum Globalvorhaben „Überprüfung des Standes der Technik der Emissionen prioritärer Schadstoffe für einzelne Industriebranchen (Kleinfeuerungsanlagen und abfallwirtschaftliche Anlagen)“ [3] .

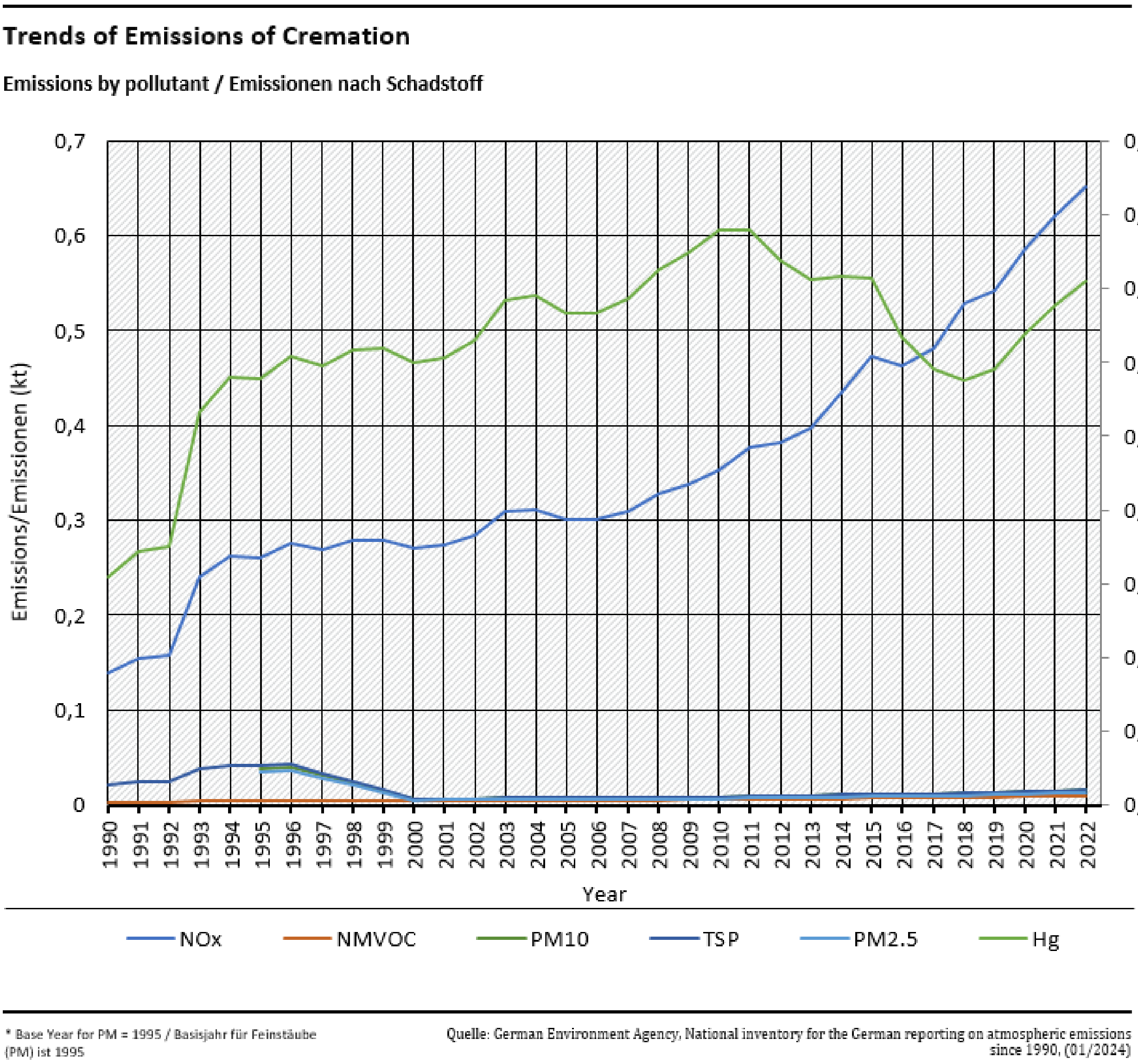
In 2018 the TERT noted that the German Hg EF is 100 times smaller than the default value proposed in the 2016 EMEP/EEA Guidebook and the Cd and Pb EF are 1000 times smaller than the default values proposed in the 2016 EMEP/EEA Guidebook. However, the EF for Pb and Cd are based on national expert judgement: assumption that a) the emissions behave similarly to dust and b) the dust limit value of the air pollution control specification (27th BImSchV) is complied with (to be confirmed on the basis of the new measurement data from 5 crematoria with different exhaust gas cleaning systems). The Hg EF was calculated on the basis of the German report on “OSPAR Recommendation 2003/4 on controlling the dispersal of mercury from crematoria“, but is under evaluation.

After the finalization of a research Project [4] the Hg EF is revised. As part of the project, emission measurements were carried out at six cremation routes. According to OSPAR reporting 2010/2014, approx. 90% of the plants have effective Hg mitigation technology, whereas approx. 10% are not equipped with effective Hg mitigation technology. This ratio is roughly reflected in the 2020 project report, too. This results in the following weighted mean value: 0.9*0.0225 g/h + 0.1*0.2468 g/h = 0.0449588207 g/h. Since the cremation duration is approximately one hour, the mean value per hour corresponds to the Hg load per cremation and is used accordingly in the inventory calculation. Values are interpolated between the two endpoints 2010 and 2018.

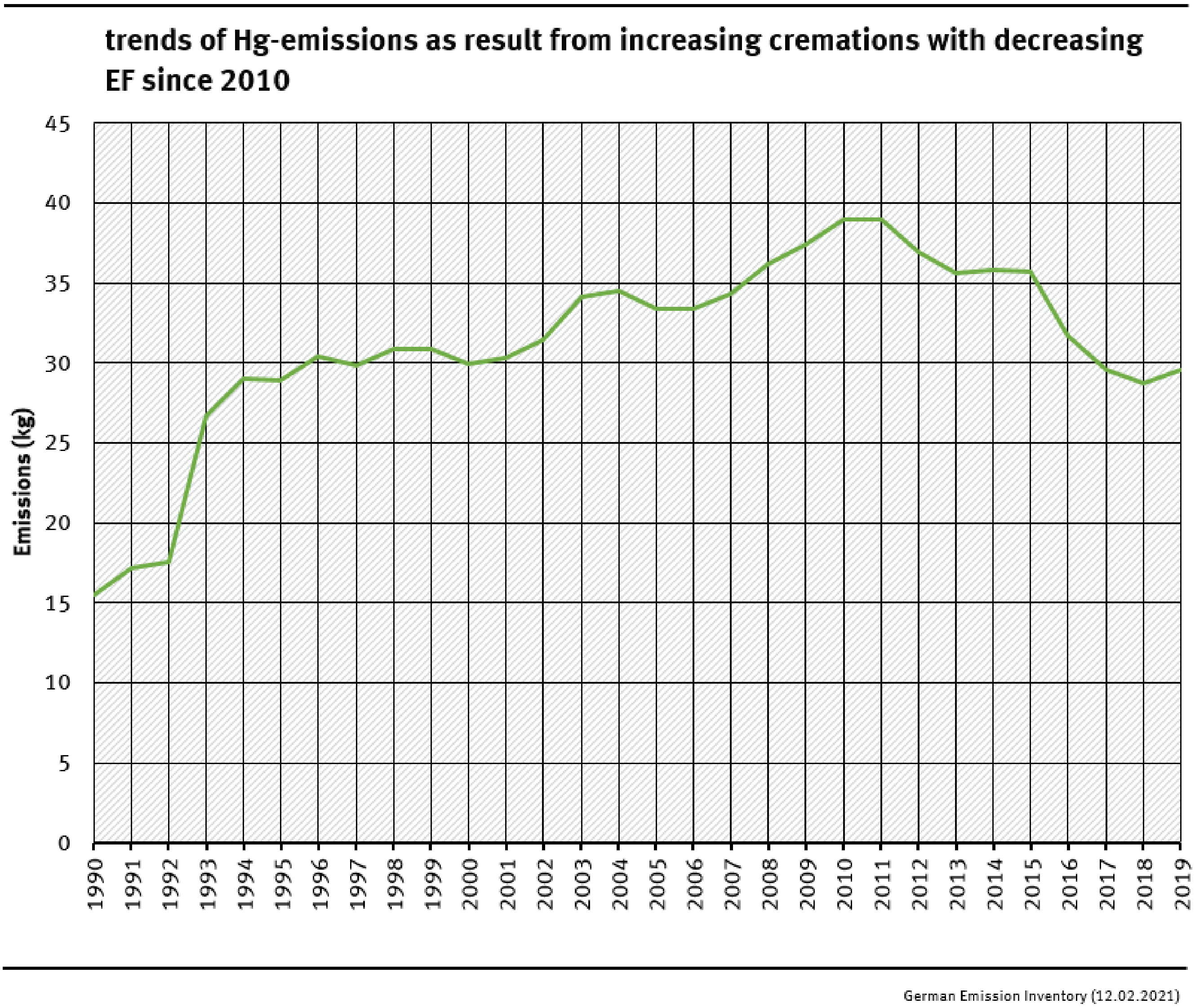
EF for TSP, PM10, and PM2.5 derive from the research study “Studie zur Korngrößenverteilung (PM10 und PM2.5) von Staubemissionen” [5].

Trends in emissions

All emission trends are the result of the increasing trend of AD, partly with decreasing EF at the same time.



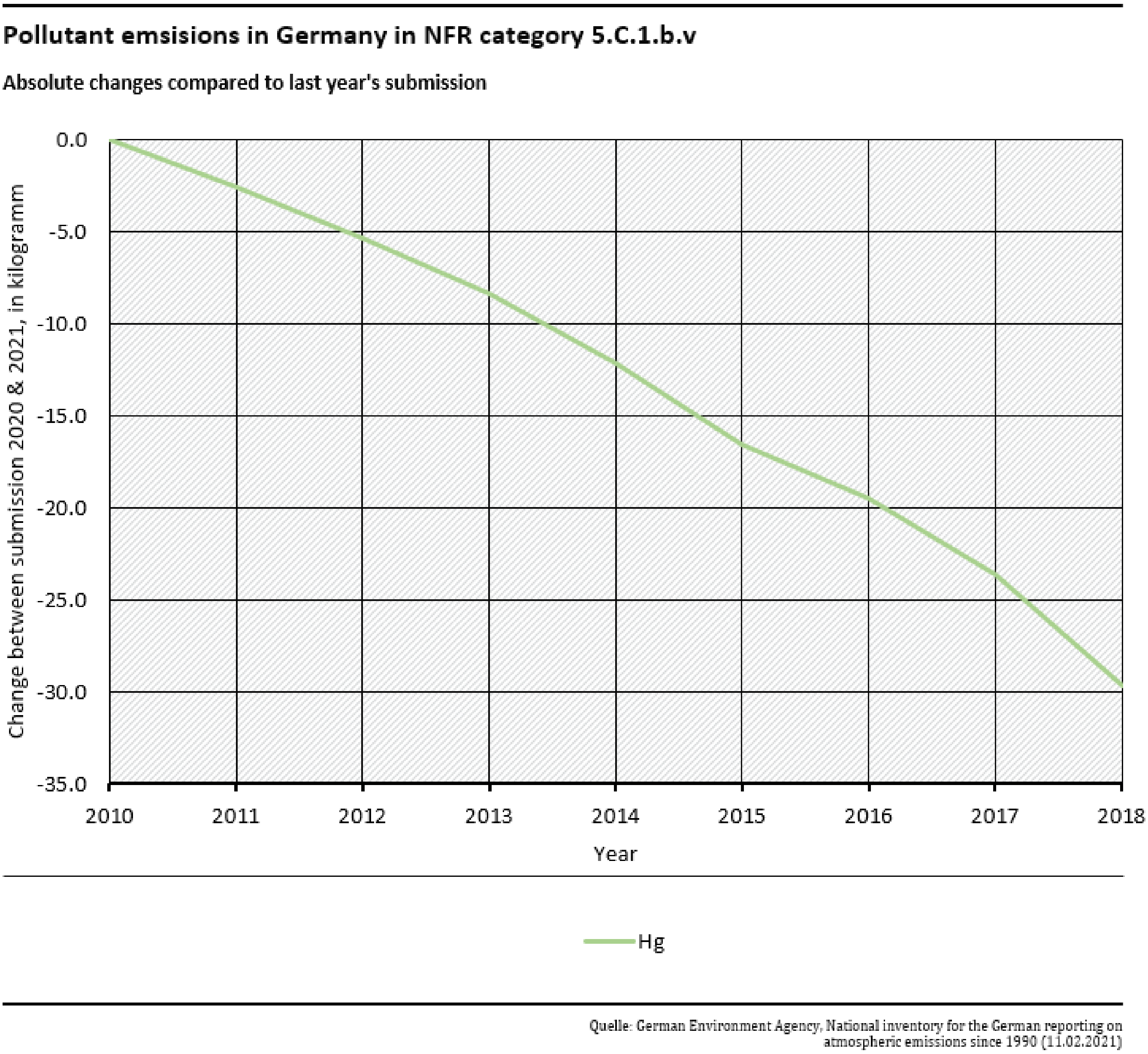
Emission trends in NFR 5.C.1.b.v



Emission trend of mercury

Recalculations

With emission factor of Mercury revised, a small recalculations has been carried out compared to last year's submission.



Recalculations in NFR 5.C.1.b.v

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.

[1] annual personal message from Stephan Neuser (contact URL: https://www.bestatter.de/verband/ansprechpartner/)
[2] EMEP/EEA air pollutant emission inventory guidebook 2016, Copenhagen, 2016
[3] Stöcklein; Gass; Suritsch: “POP- und Hg-Emissionen aus abfallwirtschaftlichen Anlagen”, Teilvorhaben zum Globalvorhaben „Überprüfung des Standes der Technik der Emissionen prioritärer Schadstoffe für einzelne Industriebranchen (Kleinfeuerungsanlagen und abfallwirtschaftliche Anlagen)“; URL: https://www.umweltbundesamt.de/sites/default/files/medien/378/publikationen/texte_38_2016_pop-und_hg-emissionen_aus_abfallwirtschaftlichen_anlagen.pdf; UBA-Texte 38/2016; im Auftrag des Umweltbundesamtes, April 2016
[4] FKZ 3716 53 3021 „Umweltrelevanz und Stand der Technik bei Einäscherungsanlagen“ (Environmental relevance and state of the art for cremation plants); URL: https://www.umweltbundesamt.de/publikationen/umweltrelevanz-stand-technik-einaescherungsanlagen
[5] Dreiseidler, A.; Baumbach, G.; Pregger, T.; Obermeier, A. (1999): Studie zur Korngrößenverteilung (< PM10 und < PM2,5) von Staubemissionen. UBA-Forschungsbericht 297 44 853, Umweltbundesamt Berlin (Study on particle size distribution (< PM10 and < PM2,5) of dust emissions)