Chapter 1.8 - General Assessment of Completeness

Introduction

The German inventory is generally complete regarding the main pollutants, TSP, particulate matter and CO. National total emissions of these pollutants are considered to be representative and to reflect the current emissions situation. Nevertheless, there are some cases where no appropriate method or data is available. It is assumed that these cases do not have a noticeable effect on the national totals and are in the range of its uncertainties.

In terms of heavy metals and POPs, the situation is different due to the low data availability. As additional information, there is a specific overview on the completeness of the German POP inventory available.

Germany does not report any emission data for years prior 1990. Due to the split into the German Democratic Republic and the Federal Republic of Germany before 1990, there are no consistent data sets covering what is now the re-united country. Germany has no plans to work on emission inventories for the years 1980 to 1989 in the future. However, some summarizing information on the time span 1970 to 1989 is presented below, also comparing these data to the current emission inventory.

Completeness in detail

The completeness of the German inventory as a whole has also been assessed by multiple reviews, both under the CLRTAP and the NECD. These reviews all confirm the good coverage of the German inventory. Where there are small omissions, Germany is working continuously to update and complete its data.

The following sections reflect on a few approaches, by source category, for improving the completeness of the inventory.

Fuel combustion



In principle, all combustion-related activities (1.A) are recorded in full within the National Energy Balance (NEB) of the Federal Republic of Germany. Nonetheless, where it is evident that complete coverage is not achieved for certain subsectors (i.e. non-commercial use of wood, waste fuels), the NEB is supplemented with further statistical data, surveys etc. Moreover, there are frequent changes within the NEB, in particular concerning renewable energies. Such changes in fuel and source categories require considerable research work. Insofar, it's not always possible to implement all data in time. However, based on current information, combustion related activity data can be considered complete.

This also applies for the main pollutants, particulate matter and CO. There may be cases, where a further breakdown of activity data and emission factors would be more appropriate to represent any specific technology. In such cases, where the share of a specific technology is very small, the influence of a missing sub-division on the national totals is considered small, too.

In some source categories, separation of combustion-related and non-combustion-related emissions from industry requires

further verification. In general, for such categories, avoidance of double counting is an important part of quality assurance.

In terms of heavy metals and POPs, emissions are not yet complete in some sectors due to a lack of appropriate emission factors. Since they may not properly reflect the situation in Germany and in order to avoid inconsistencies within the German inventory as a whole, it is not always advisable to use default emission factors. In addition, fixed default EFs do not reflect the influence of technological developments onto the trends of certain emissions. Nevertheless, many country-specific emission factors (which are highly uncertain) are available for all combustion plants. All key categories are reported.

Industrial processes

In the area of industrial processes, for the application of higher tier approaches some use is made of production data from association statistics and of manufacturers' information. In the interest of the inventory's completeness and reliability those data sets get specific QA/QC procedures. The inventory is considered complete for the main industrial processes.

Agriculture

In the area of agriculture, while survey data from a past research project on management systems in animal husbandry are available, an effort is being made to carry out periodic, representative data surveys, in the interest of the inventory's continuing completeness and consistency.

Explanation on the use of notation keys

The use of notation keys in the German inventory is carefully checked each year. All notation keys are used as defined in the guidance documents.

The following tables from the CLRTAP Stage 1 Reviews 2022 and 2023 give a good indication on where and how frequently notation keys are used in Germany's air polltutant reporting.

Though NEs are great in number, the actual emission behind each of the notation keys is estimated to be very small. In some cases, it is actually used instead of NA to make absolutely sure to be on the conservative side of the estimate.

Germany is working continuously to decrease the number of notation keys used and has already made good progress in this regard. The comparison shows that the number of NE notations used in the inventory could be reduced for almost all reported pollutants. However, this is mainly due to two facts:

• For NFR 1.A.2.b, all NE notations have been replaced by IE.

and

• The entire NFR 2.J - Production of POPs is reported as not occuring in Germany now and all NE have been replaced by NO notations.

Component	% Value	%0	%NO	% NE	%NA	% IE	% C	% NR	% All
NOx	48.0	0.0	6.0	3.0	38.0	5.0	0.0	0.0	100.0
NMVOC	55.0	0.0	6.0	5.0	29.0	5.0	0.0	0.0	100.0
SOx	36.0	0.0	6.0	3.0	51.0	3.0	0.0	0.0	100.0
NH3	42.0	0.0	6.0	4.0	43.0	5.0	0.0	0.0	100.0
PM2.5	51.0	0.0	6.0	4.0	30.0	9.0	0.0	0.0	100.0
PM10	51.0	0.0	6.0	3.0	31.0	9.0	0.0	0.0	100.0
TSP	53.0	0.0	6.0	2.0	30.0	9.0	0.0	0.0	100.0
BC	23.0	0.0	6.0	22.0	45.0	4.0	0.0	0.0	100.0
CO	33.0	0.0	6.0	3.0	52.0	6.0	0.0	0.0	100.0
Pb	27.0	0.0	6.0	6.0	57.0	5.0	0.0	0.0	100.0
Cd	28.0	0.0	6.0	6.0	56.0	5.0	0.0	0.0	100.0
Hg	28.0	0.0	6.0	6.0	56.0	3.0	0.0	0.0	100.0
As	23.0	0.0	6.0	8.0	60.0	3.0	0.0	0.0	100.0
Cr	22.0	0.0	6.0	7.0	61.0	3.0	0.0	0.0	100.0
Cu	23.0	0.0	6.0	8.0	60.0	3.0	0.0	0.0	100.0
Ni	22.0	0.0	6.0	8.0	61.0	3.0	0.0	0.0	100.0
Se	17.0	0.0	6.0	12.4	61.0	3.0	0.0	0.0	100.0
Zn	22.0	0.0	6.0	9.0	60.0	3.0	0.0	0.0	100.0
DIOX	26.0	0.0	6.0	3.0	61.0	3.0	0.0	0.0	100.0
PAH	24.0	0.0	6.0	5.0	62.0	2.0	0.0	0.0	100.0
HCB	11.7	0.0	6.0	11.4	68.9	2.0	0.0	0.0	100.0
PCB	15.0	0.0	6.0	10.0	66.0	2.0	0.0	0.0	100.0

Overview from CLRTAP Stage1 Review 2022

Component	% Value	%0	%NO	% NE	% NA	% IE	% C	% NR	% A11
NOx	48.0	0.0	7.0	2.0	38.0	5.0	0.0	0.0	100.0
NMVOC	55.0	0.0	7.0	4.0	28.0	6.0	0.0	0.0	100.0
SOx	36.0	0.0	7.0	2.0	51.0	3.0	0.0	0.0	100.0
NH3	43.0	0.0	7.0	3.0	43.0	5.0	0.0	0.0	100.0
PM2.5	51.0	0.0	7.0	3.0	30.0	9.0	0.0	0.0	100.0
PM10	51.0	0.0	7.0	2.0	31.0	9.0	0.0	0.0	100.0
TSP	53.0	0.0	7.0	2.0	30.0	9.0	0.0	0.0	100.0
BC	23.0	0.0	7.0	19.0	46.0	6.0	0.0	0.0	100.0
co	34.0	0.0	7.0	2.0	52.0	6.0	0.0	0.0	100.0
Pb	27.0	0.0	7.0	4.0	57.0	5.0	0.0	0.0	100.0
Cd	28.0	0.0	7.0	4.0	57.0	5.0	0.0	0.0	100.0
Hg	30.0	0.0	7.0	4.0	55.0	4.0	0.0	0.0	100.0
As	23.0	0.0	7.0	6.0	61.0	4.0	0.0	0.0	100.0
Cr	22.0	0.0	7.0	6.0	61.0	4.0	0.0	0.0	100.0
Cu	23.0	0.0	7.0	6.0	61.0	4.0	0.0	0.0	100.0
Ni	22.0	0.0	7.0	6.0	61.0	4.0	0.0	0.0	100.0
Se	17.0	0.0	7.0	13.0	59.0	4.0	0.0	0.0	100.0
Zn	22.0	0.0	7.0	6.0	61.0	4.0	0.0	0.0	100.0
DIOX	26.0	0.0	7.0	2.0	61.0	3.0	0.0	0.0	100.0
PAH	24.0	0.0	7.0	3.0	62.0	3.0	0.0	0.0	100.0
HCB	11.6	0.0	7.0	9.0	69.0	3.0	0.0	0.0	100.0
PCB	15.0	0.0	7.0	9.0	66.0	3.0	0.0	0.0	100.0

Overview from CLRTAP Stage1 Review 2023

As for categories, NE notations are used mainly in **Industrial Processes** and **Waste** (please refer to section 1c of the review report 2022 for details). (The correspondig report for 2023 is not yet publically avilable) Each use is individually justified in the corresponding source category sections of this report as well as in the table below.

NFR categories reported as 'not estimated' ('NE')

NFR category	pollutants effected	explanation / reasoning
1.A.1.b	HCB, PCBs	no country-specific EF at hand; notation key 'NE' provided in EMEP/EEA GB 2023, Chapter 1.A.1 Energy industries 2023
1.A.1.c	HCB (as of 2012), PCBs	no country-specific EF at hand; notation key 'NA' provided in EMEP/EEA GB 2023, Chapter 1.A.1 Energy industries 2023 -> implementation will be checked
1 4 2 2		no country-specific tier2 EFs at hand; notation key 'NE' provided in EMEP/EEA GB 2023, Chapter 1.A.2 Combustion in manufacturing industries and construction 2023, Tables 3-7 to 3-12

Image: Sec: Construction Sec: Construction <th>NFR</th> <th>pollutants effected</th> <th>explanation / reasoning</th>	NFR	pollutants effected	explanation / reasoning
al. Al. Proc. Proc. All Control All Control All Control All Control COOLP Accountry-sector: Eff a hand, control provide in EMPEREA 68.2023; Chapter 1.A.3 a Aniston 2023 All All Control COOLP Accountry-sector: Eff a hand, control provide in EMPEREA 68.2023; Chapter 1.A.3 a Aniston 2023 All All Control Cool Provide in Eff a hand, control EMPEREA 68.2023; Chapter 1.A.3 a Aniston 2023 All All Control Coontry-sector: Eff a hand, control EMPEREA 68.2023; Chapter 1.A.3 a Aniston 2023 All All Control Coontry-sector: Eff a hand, control EMPEREA 68.2023; Chapter 1.A.3 a Aniston 2023 All All Control Coontry-sector: Eff a hand, control EMPEREA 68.2023; Chapter 1.A.1 a Aniston 2023 All All Control Control Provide in EMPEREA 68.2023; Chapter 1.A.4 a Small Control EMPEREA 68.2023; Chapter 1.A.4 Small Control EMPEREA 68.	1.A.2.e	Pb, Cd, Hg, As, Cr, Cu, Ni, Se, Zn, PCDD/F, B[a]P, B[b]F, B[k]F,	only emissions from process-combustion in sugar industry reported here with no country-specific tier2 EF at hand; only tier1 default EF provided EMEP/EEA GB 2023, Chapter 1.A.2 Combustion in manufacturing industries and construction 2023, Tables 3-2
Outcome Inclusion Inclusion Inclusion Inclusion 0.100000000000000000000000000000000000	vii	HCB, PCBs	no country-specific EF at hand; no default provided in EMEP/EEA GB 2023, Chapter 1.A.4 Non road mobile machinery 2023
Image Image <th< td=""><td>i(i)</td><td>PCDD/F</td><td>no country-specific EF at hand; no default provided in EMEP/EEA GB 2023, Chapter 1.A.3.a Aviation 2023</td></th<>	i(i)	PCDD/F	no country-specific EF at hand; no default provided in EMEP/EEA GB 2023, Chapter 1.A.3.a Aviation 2023
m m	ii(i)	PCDD/F	no country-specific EF at hand; no default provided in EMEP/EEA GB 2023, Chapter 1.A.3.a Aviation 2023
A.3.b. bit Sea 607000 LA1asi inc. control specific P1 at hand, no edeulate for EC provided in EMEP(EA G 2023, Chapter 1A.3.b.n/will Read tyre and brake wear 2023) LA1asi dev 21000.E in a fir provided in EMEP(EA G 2023, Chapter 2.1 at hera.3.b. fir provided in the field and everement Fir provided in EMEP(EA G 2023, Chapter 1.2 dev 2005, Chapter 2.2 de	iv		no country-specific EF at hand; no default provided in EMEP/EEA GB 2023, Chapter 1.A.3.b.i-iv Road transport 2023
Image of the second s			no country-specific EFs at hand; no defaults for BC provided in EMEP/EEA GB 2023, Chapter 1.A.3.b.vi-vii Road tyre and brake wear 2023
1.4.4.a ps ps<	vii	BC	
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1.4.4.6 INEC, PCB. In country-specific EF a hand, no defaul provided in EMEPIEA 68 2023, Chapter 1.4.4 km rade mobile machinery 2023 1.5. Mill, Se, Zn, PCB. on country-specific EF a valiable 2.3.3 Mill, Se, Zn, PCB. on oppropriate EF a valiable 2.3.4 AF, CN, CN, PCB. on oppropriate EF a valiable 2.3.3 Mill, Se, Zn, PCB. on oppropriate EF a valiable 2.3.4 Mill, Se, Zn, PCB. on oppropriate EF a valiable 2.3.5 Mill, Se, Zn, Se, Zn, PCB. on oppropriate EF a valiable 2.3.6 Mill, Se, Zn, Se, Zn, PCB. on oppropriate EF a valiable 2.3.7 Mill, Se, Zn, Se, Zn, PCB. on oppropriate EF a valiable 2.3.8 Mill, Se, Zn, Se, Zn, PCB. on oppropriate EF a valiable 2.3.8 Mill, Se, Zn, Se, Zn, PCB. on oppropriate EF a valiable 2.3.8 Mill, Se, Zn, Se, Zn, PCB. se of default EF will be checked for following submissions 2.3.8 Mill, Se, Zn, Se, Zn, PCB. se of default EF will be checked for following submissions 2.3.8 Res of So 2000, Se EMEPIEA GB 2023, Chapter 2.6.2 Ferroables provided in EMEPIEA B223 2.4.4 Mill, Se Zn, Se, Se Zn, PCB.			
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A1. Abs. Cr., Cu., NJ., Se. no appropriate EFs available A2.2 Pb. Cd as of 2000. no appropriate EFs available B2.3.3 PM., Cd as of 2000. no appropriate EFs available B2.3.4 PM., Se of 2000. col of split factors for PM will be checked for following submissions B2.7.1 PM., Se of 2000. col of split factors for PM will be checked for following submissions B2.7.1 PM., Se of 2000. col of default EF will be checked for following submissions B2.7.1 PM., NWOC, So. RMPPEA Cd 8 2023. Chapter 2.C 2 Fernal logs production, table 31: no EFs provided in EMEP GB 2023 B2.7.1 PM., Se of 2000. col of default EF will be checked for following submissions B2.7.2 PM., NWOC, So. RMPPEA Cd 8 2023. Chapter 2.C 2 Fernal logs production, table 31: no EFs provided in EMEP GB 2023 B2.7.2 PM., So. pp primary magnetism production in GFs provided in EMEP GB 2023 C.7.2 PM. So. pp primary magnetism production in GFs provided in EMEP GB 2023 C.7.2 PM. So. pp primary magnetism production in GFs provided in EMEP GB 2023 C.7.4 PM. So. pp primary magnetism production in GFs provided in EMEP GB 2023 C.7.6 CG Co. So. PMEPEA CG 2023. Chapter 2.C.7 a C Soper production in GFs pr	1 4 5 2	Pb, Cd, As, Cr, Cu,	
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BALS PMLS and production 28.3 PMLS and production and production 28.4 as of 1995; PMLS as of 1995; PMLS as of 1995; PMLS 28.7 PMLS as of 1995; PMLS as of 1995; PMLS 28.1 ALS, US, S. Z.D., C.D., PL, C.B., R.D., PL as of 1995; PMLS as of 1995; PMLS 28.2 MALS, S. Z.D., C.D., PL, C.H., PL, C.H., PL MEMPERA GB 2023, CLAPPERA GB 2023	2.A.2	Pb, Cd as of 2000:	no appropriate EFs available
as of 1995: PM, as of 1995: PM, as of 1995: PM, Reg. as of 2000: BC as of 3000: C as of 4000: C as of 1995: PM, as of 1995: PM, be of default EF will be checked for following submissions 21:1 Reg. 400: PM, C as of 1995: PM, as of 1995: PM, be of default EF will be checked for following submissions 22:2 CO, PM, CG, Hp, GC MAPCC, Cr, Se BE BMPCCC, Cr, Se BE BMPCEA GB 2023, Chapter 2.C.2 Adminium production: no EFs provided in EMEP GB 2023 22:3 BC, BUE, BLKF, may magnesium production in Germany, only F-Gases are reported under 2.C.4, other occurring emissions from secondary magnesium production are reported in EMEP GB 2023 22:4 MAVOC, TSP, PM, pp imary magnesium production in Germany, only F-Gases are reported under 2.C.4, other occurring emissions from secondary magnesium production are reported in EMEP GB 2023 22:5 BC (as of 2000), EMEP/EEA GB 2023, Chapter 2.C.2 Log approximation on EF provided in EMEP GB 2023 22:7.0 Se BEF/EEA GB 2023, Chapter 2.C.2 Log approximation on EF provided in EMEP GB 2023 22:7.1 Se BEF/EEA GB 2023, Chapter 2.C.2 Copper production on CF provided in EMEP GB 2023 22:7.2 Se (as 02000), BE BEF/EEA GB 2023, Chapter 2.C.2 C Opper productin for getavaniz			no country-specific EF at hand; no default provided in EMEP/EEA GB 2023, Chapter: 2.B Chemical industry 2023, Table 3.16 - Tier 2 emission factors for source category 2.B.3 Adipic acid production
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2.2.2Co, Pb, Cd, Hg, CdEMEP/EEA GB 2023. Chapter 2.2.2 Ferroalloys production, table 3.1: no EFs provided in EMEP GB 20232.3.3MMUCC, Cr, SeBMEP/EEA GB 2023. Chapter 2.2.2.3 Autinium production: no EFs provided in EMEP GB 20232.4.4MMUCC, Cr, SeBMEP/EEA GB 2023. Chapter 2.2.5 Lead production in Germany: only F-Gases are reported under 2.C.4, other accurring emissions from secondary magnesium production are reported in the Ene2.2.4MMUCC, Cr, SeSeEMEP/EEA GB 2023. Chapter 2.C.5 Lead production in Germany: only F-Gases are reported under 2.C.4, other accurring emissions from secondary magnesium production are reported in the Ene2.2.6B CG so 7 2000. SeEMEP/EEA GB 2023. Chapter 2.C.6 .2 End production no EF provided in EMEP GB 20232.7.7Se (Ga of 2000.)EMEP/EEA GB 2023. Chapter 2.C.7. Cother metal production no EF provided in EMEP GB 20232.7.8SC (Sa 07 2000.)EMEP/EEA GB 2023. Chapter 2.C.7. Cother metal production for galvanization no EF provided in EMEP GB 2023.2.7.8SC (Sa 07 2000.)EMEP/EEA GB 2023. to be checked; BC: use of NA' will be checked2.7.8SC (Sa 07 2000.)EMEP/EEA GB 2023. to be checked; BC: use of NA' will be checked2.7.8BVIF, [KJP, PAH inter 2.5, AC (Cherr metal provided in EMEP/EEA GB 2023, Chapter 2.D.3.C Asphalt roofing 2023, Table 3-1 to 3-32.7.8BVIF, BUF, BL, BUF, BL, BUF, BL, BUF, BL, BUF, BL, SA, SA, SA, SA, SA, SA, SA, SA, SA, SA	2.C.1	As, Cu, Se, Zn, B[a]P, B[b]F, B[k]F, I[1,2,3-c,d]P as of	use of default EF will be checked for following submissions
2.3.3 BC, B[DF, B[KF, MAX, ACAP EMEP/EAG 0225, Chapter 2.C.2.3 Authinitisions 2.4.3 MMVOC, TSP, PMA, in portmax magnesium production in Germany; only F-Gases are reported under 2.C.4, other occurring emissions from secondary magnesium production are reported in the Energy EAG 0223. 2.6.4 MMVOC, TSP, PMA, in portmax magnesium production in Germany; only F-Gases are reported under 2.C.4, other occurring emissions from secondary magnesium production are reported in EMEP GB 2023. 2.6.6 BC (as of 2000), Se (EMEP/EAG 0223, Chapter 2.C.5. Load production no EF provided in EMEP GB 2023 2.6.7 BC (as of 2000), Se (EMEP/EAG 0223, Chapter 2.C.7.a Copper production no EF provided in EMEP GB 2023 2.7.7 BC (as of 2000), Se (EMEP/EAG 0223, Chapter 2.C.7.a Copper production for galvanization no EF provided in EMEP GB 2023 2.7.8 BC (as of 2000), Se (EMEP/EAG 0223, Chapter 2.C.7.c Other metal production for galvanization no EF provided in EMEP GB 2023 2.7.8 BC (as of 2000), Se (EMEP/EAG 0223, Chapter 2.C.7.c Other metal production for galvanization no EF provided in EMEP GB 2023, Chapter 2.D.3.c Asphalt roofing 2023, Table 3-1 to 3-3 2.7.8 BC (as of 2000), Se (Calper, Calper, C		CO, Pb, Cd, Hg, Cr	EMEP/EEA GB 2023, Chapter 2.C.2 Ferroalloys production, table 3.1: no EFs provided in EMEP GB 2023
AL-4 Mm_b, BC sector under 1A.2.b. 2.C.5 BC (as of 2000), Se EMEP/EEA GB 2023, Chapter 2.C.5 Lead production no EFs provided in EMEP GB 2023 2.C.6 BC (as of 2000), Se EMEP/EEA GB 2023, Chapter 2.C.7.a Coper production no EF provided in EMEP GB 2023 2.C.7.a BC (as of 2000), Se EMEP/EEA GB 2023, Chapter 2.C.7.a Coper production no EF provided in EMEP GB 2023 2.C.7.a BC (as of 2000), Se EMEP/EEA GB 2023, Chapter 2.C.7.c Other metal production for galvanization no EF provided in EMEP GB 2023 2.C.7.b BC (as of 2000), Se MEP/EEA GB 2023, Chapter 2.C.7.c Other metal production for galvanization no EF provided in EMEP GB 2023 2.C.7.c SG, Glaip RibJF, BIDF, BIQF, IL1, as of 2000: BC no country-specific EF at hand; GB 2023 to be checked; BC: use of 'NA' will be checked 2.D.3.c BLP, FLAGR No country-specific EF at hand; rotation key 'NE' provided in EMEP/EEA GB 2023, Chapter 2.D.3.c Asphalt roofing 2023, Table 3-1 to 3-3 (11,23,c)dP, PAH 1.4 1.4 Se of 2000: BC use of default EF will be checked for BC, use of 'NA' for PCB will be checked 2.1.1 as of 2000: BC use of default EF will be checked for BC, use of 'NA' for PCB will be checked 2.1.2 as of 2000: BC use of default EF will be checked for BC, use of 'NA' for PCB will be checked 2.1.4 as of 2000: BC use o	2.C.3	BC, B[b]F, B[k]F, I[1,2,3-c,d]P	use of default EFs will be checked for following submissions
22.C.6 BC (as of 2000), Se EMEP(EAG 68 2023, Chapter 2.C.6 2 Comper production no EF provided in EMEP GB 2023 BC (as of 2000), Ni use of default EF will be checked for following submissions 2.C.7.a BC (as of 2000), Se EMEP(EEA 68 2023, Chapter 2.C.7.a Comper production no EF provided in EMEP GB 2023 BC, BialP, 801F, 1-4, as of 2000; BC 2.D.3.b BLF, ISP, PAH I-4, as of 2000; BC no country-specific EF at hand; GB 2023 to be checked; BC: use of 'NA' will be checked 2.D.3.b BLF, ISP, PAH I-4, as of 2000; BC no country-specific EF at hand; GB 2023 to be checked; BC: use of 'NA' will be checked 2.D.3.c BIB/F, BIK/F, III, 2.3-c-dIP, PAH I-14 no country-specific EF at hand; notation key 'NE' provided in EMEP/EEA GB 2023, Chapter 2.D.3.c Asphalt roofing 2023, Table 3-1 to 3-3 2.H.1 NH3, PCBs, as of 2000; BC use of default EF will be checked for GC, use of 'NA' for PCB will be checked 2.H.3 as of 2000; BC use of default EF will be checked for GB C, use of 'NA' for PCB will be checked 2.H.3 as of 2000; BC as of 2000; BC use of default EF will be checked for GB C use of rot re next annual submission 2.H.3 as of 2000; BC no country-specific EF at hand; no information provided in EMEP/EEA GB 2023, Chapter 2.L Wood processing 2023 2.H.4 as of 2000; BC no country-specific EF at hand; no information provided in EMEP/EEA GB 2023, Chapter 2.L Wood processing 2023	2.C.4		
2.C.7.a Se MEPEEA GB 2023, Chapter 2.C.7.a Copper production no EF provided in EMEP GB 2023 2.C.7.a BC (as of 2000), NI EMEPEEA GB 2023, Chapter 2.C.7.c Other metal production for galvanization no EF provided in EMEP GB 2023 2.C.7.c BC (as of 2000), NI EMEP/EEA GB 2023, Chapter 2.C.7.c Other metal production for galvanization no EF provided in EMEP GB 2023 2.C.7.a BC (as of 2000), NI EMEP/EEA GB 2023, Chapter 2.C.7.c Other metal production for galvanization no EF provided in EMEP GB 2023 2.0.3.b B(LF, I[X]P, PAH II-14, as of 2000; BC, B[a]P, B[LF, I[X]P, PAH II-14, as of 2000; BC, B[a]P, B[LF, PAH II-14, as of 2000; BC no country-specific EF at hand; GB 2023 to be checked; BC: use of 'NA' will be checked 2.0.3.c B(D)F, B(LF, PAH II-14, as of 2000; BC use of default EF will be checked for BC, use of 'NA' for PCB will be checked 2.1.1 2000; BC use of default EF will be checked for BC, use of 'NA' for PCB will be checked 2.1.2.3 as of 2000; BC use of default EF will be checked for BC and for the next annual submission 2.1.3 as of 2000; BC use of default EF will be checked for following submissions 2.1.4 as of 2000; BC as of 2000; BC as of 2000; BC 2.1.5 as of 2000; BC as of 2000; BC as of 2000; BC as of 2000; BC 2.1.6 BC <t< td=""><td>2.C.5</td><td>BC (as of 2000), Se</td><td>EMEP/EEA GB 2023, Chapter 2.C.5 Lead production no EFs provided in EMEP GB 2023</td></t<>	2.C.5	BC (as of 2000), Se	EMEP/EEA GB 2023, Chapter 2.C.5 Lead production no EFs provided in EMEP GB 2023
BC (as of 2000), Ni Use of default EF will be checked for following submissions 2.C.7.c BC (as of 2000), SO, MEP/EEA GB 2023, Chapter 2.C.7.c Other metal production for galvanization no EF provided in EMEP GB 2023 2.0.3.b B[K], I[X]P, RAH 1-4, as of 2000; BC no country-specific EF at hand; GB 2023 to be checked; BC: use of 'NA' will be checked 2.0.3.b B[K]P, I[X]P, RAH 1-4, as of 2000; BC no country-specific EF at hand; rotation key 'NE' provided in EMEP/EEA GB 2023, Chapter 2.D.3.c Asphalt roofing 2023, Table 3-1 to 3-3 of 2000; BC, B[A]P, B[K]P, I[1,2,3-c,d]P, RAF 2.1.4. NH3, PCBs, as of 2000; BC use of default EF will be checked for following submissions 2.1.4. NH3, PCBs, as of 2000; BC use of default EF will be checked for following submissions 2.1.4.3 as of 2000; BC use of default EF will be checked for following submissions 2.1.4.3 as of 2000; BC use of default EF will be checked for following submissions 2.1.4.3 as of 2000; BC use of default EF will be checked for following submissions 2.1.4.3 as of 2000; BC use of default EF will be checked for following submissions 2.1.4.3 as of 2000; BC use of default EF will be checked for following submissions 2.1.4.3 as of 2000; BC use of default EF will be checked for f	2.C.6	BC (as of 2000), Se	
22.7.7c SO, ENERFECTION SUCCIDENTIAL CLARENCE OF 2023 2.0.3.b BC, B[a]P, B[b]F, II, IZ, JS, CHIP, PAH 14, as of 2000: BC, DOU: BC, B[a]P, B[b]F, II, IZ, JS, CHIP, PAH 14 no country-specific EF at hand; GB 2023 to be checked; BC: use of 'NA' will be checked 2000: BC, B[a]P, B[b]F, II, IZ, JS, CHIP, B[k]F, II, IZ, IZ, II, IZ, IZ, II, IZ, IZ, II, IZ, IZ	2.C.7.a	Se BC (as of 2000), Ni	
2.1.3. blk/F, [IX,P, PAH black no country-specific EF at hand; GB 2023 to be checked; BC: use of 'NA' will be checked 2.1.3. black PM2.5, PM10,TSP, as of 2000: BC [Ba]P, [IX, 2, 3-c, d]P, PAH black no country-specific EF at hand; notation key 'NE' provided in EMEP/EEA GB 2023, Chapter 2.D.3.c Asphalt roofing 2023, Table 3-1 to 3-3 2.1.1 NH3, PCBs, as of 2000: BC use of default EF will be checked for BC, use of 'NA' for PCB will be checked 2.1.2. as of 2000: BC use of default EF will be checked for BC, use of 'NA' for PCB will be checked 2.1.3 as of 2000: BC use of default EF will be checked for BC and for the next annual submission 2.1.4 as of 2000: BC as of 2000: BC as of 2000: BC 2.1.3 as of 2000: BC as of 2000: BC as of 2000: BC 2.1.4 BC PG missions of FC EF at hand; no information provided in EMEP/EEA GB 2023, Chapter 2.I Wood processing 2023 2.1.4 as of 2000: BC as of 2000: BC as of 2000; BC could not be ruled out but not data on national level is available and the standard EF (based on capita) will lead to unrealistic high emissions. 2.1.4 BC BC C, S, C, C, U, Ni, S, C, T, B(K)F BC emissions unlikely to occur from dry bulk goods; no information EMEP/EEA GB 2023, Chapter 2.L Other production, consumption of public to bulk products 2023 2.1.4 BC BC C, S, C, C, U, Ni, S, C, T, B(K)F	2.C.7.c		EMEP/EEA GB 2023, Chapter 2.C.7.c Other metal production for galvanization no EF provided in EMEP GB 2023
2D.3.c.of 2000: BC, BlajP, BlbJF, BlkJF, II,12,2-C, CJP, PARo country-specific EF at hand; notation key 'NE' provided in EMEP/EEA GB 2023, Chapter 2.D.3.c Asphalt roofing 2023, Table 3-1 to 3-32H.1MH3, PCBs, asouse of default EF will be checked for BC, use of 'NA' for PCB will be checked2H.2as of 2000: BCuse of default EF will be checked for following submissions2.H.3as of 2000: BCuse of default EF will be checked for following submissions2.H.3as of 2000: BCno country-specific EF at hand; no information provided in EMEP/EEA GB 2023, Chapter 2.I Wood processing 20232.H.3as of 2000: BCno country-specific EF at hand; no information provided in EMEP/EEA GB 2023, Chapter 2.I Wood processing 20232.H.4pCBEMEP GB 2019, https://www eea.europa.eu/publications/emep-eea-guidebook-2019/part-b-sectoral-guidance-chapters/2-industrial-processes/2-k-consumption-of-pops/2-k-con	2.D.3.b	B[k]F, I[x]P, PAH	no country-specific EF at hand; GB 2023 to be checked; BC: use of 'NA' will be checked
2.1.1 2000: BC Use of default EF will be checked for BC, use of NA for PCB will be checked 2.1.2 as of 2000: BC use of default EF will be checked for following submissions 2.1.3 as of 2000: BC as for all other pollutants, 'NA' will be reported for BC and for the next annual submission 2.1.4 as of 2000: BC no country-specific EF at hand; no information provided in EMEP/EEA GB 2023, Chapter 2.1 Wood processing 2023 2.1.4 as of 2000: BC no country-specific EF at hand; no information provided in EMEP/EEA GB 2023, Chapter 2.1 Wood processing 2023 2.K PCB EMEP GB 2019, https://www.eea.europa.eu/publications/emep-eea-guidebook-2019/part-b-sectoral-guidance-chapters/2-industrial-processes/2-k-consumption-of-pops/2-k-consumption		of 2000: BC,B[a]P, B[b]F, B[k]F, I[1,2,3-c,d]P, PAH	
2.H.3 as of 2000: BC as for all other pollutants, 'NA' will be reported for BC and for the next annual submission 2.I as of 2000: BC no country-specific EF at hand; no information provided in EMEP/EEA GB 2023, Chapter 2.I Wood processing 2023 2.K PCB EMEP GB 2019, https://www.eea.europa.eu/publications/emep-eea-guidebook-2019/part-b-sectoral-guidance-chapters/2-industrial-processes/2-k-consumption-of-pops/2-k-consumption-of-pops/2-K-cons	2.H.1		use of default EF will be checked for BC, use of 'NA' for PCB will be checked
2.H.3 as of 2000: BC as for all other pollutants, 'NA' will be reported for BC and for the next annual submission 2.I as of 2000: BC no country-specific EF at hand; no information provided in EMEP/EEA GB 2023, Chapter 2.I Wood processing 2023 2.K PCB EMEP GB 2019, https://www.eea.europa.eu/publications/emep-eea-guidebook-2019/part-b-sectoral-guidance-chapters/2-industrial-processes/2-k-consumption-of-pops/2-k-consumption-of-pops/2-K-cons	2.H.2	as of 2000: BC	use of default EF will be checked for following submissions
2.1 as of 2000: BC no country-specific EF at hand; no information provided in EMEP/EEA GB 2023, Chapter 2.1 Wood processing 2023 2.K PCB EMEP GB 2019, https://www.eea.europa.eu/publications/emep-eea-guidebook-2019/part-b-sectoral-guidance-chapters/2-industrial-processes/2-k-consumption-of-pops/2-k-consumption-of			
2.K PCB EMEP GB 2019, https://www.eea.europa.eu/publications/emep-eea-guidebook-2019/part-b-sectoral-guidance-chapters/2-industrial-processes/2-k-consumption-of-pops/2-k-consumption-of-			no country-specific EF at hand; no information provided in EMEP/EEA GB 2023, Chapter 2.1 Wood processing 2023
S.C.1.b v BC, As, Cr, Cu, Ni, Se, Zn, B[k]F BC: 'NE' provided in EMEP/EEA GB 2023, Chapter 5.C.1.b.v Cremation 2023, use of 'NA' will be checked; HM and B[k]F: use of national EF will be checked S.C.1.b v NH ₃ , Pb, Cd, Hg, PCB NH ₃ , not Heavy Metals: use of 'NA' will be checked; for other pollutants no appropriate EFs available PCB 1.A.3.a ((ii) PCDD/F no country-specific EF at hand; no default provided in EMEP/EEA GB 2023, Chapter 1.A.3.a Aviation 2023 1.A.3.a (iii) PCDD/F no country-specific EF at hand; no default provided in EMEP/EEA GB 2023, Chapter 1.A.3.a Aviation 2023			https://www.eea.europa.eu/publications/emep-eea-guidebook-2019/part-b-sectoral-guidance-chapters/2-industrial-processes/2-k-consumption-of-pops/2-k-consumption-of-pops/view, Table 3.1: emissions of PCB could not be ruled out but no data on national level is available and the standard EF (based on capita) will lead to unrealistic high emissions.
Sc. 20 Se, Zn, B[k]F BC. NE [plotted in EMEP/EEA GB 2023, Chapter 3.C.I.J.V Clemation 2023, use of NA will be checked; find and b[k]F. use of hadding EF will be checked; Sc. 2 Zn, PCDD/F, HCB, PCBs NH ₃ and Heavy Metals: use of 'NA' will be checked; for other pollutants no appropriate EFs available 1.A.3.a PCDD/F no country-specific EF at hand; no default provided in EMEP/EEA GB 2023, Chapter 1.A.3.a Aviation 2023 1.A.3.a PCDD/F no country-specific EF at hand; no default provided in EMEP/EEA GB 2023, Chapter 1.A.3.a Aviation 2023		BC, As, Cr, Cu, Ni,	
1.A.3.a (III) PCDD/F no country-specific EF at hand; no default provided in EMEP/EEA GB 2023, Chapter 1.A.3.a Aviation 2023 1.A.3.a iI(II) PCDD/F no country-specific EF at hand; no default provided in EMEP/EEA GB 2023, Chapter 1.A.3.a Aviation 2023		NH₃, Pb, Cd, Hg, As, Cr, Cu, Ni, Se, Zn, PCDD/F, HCB,	
1.A.3.a ii(ii) PCDD/F no country-specific EF at hand; no default provided in EMEP/EEA GB 2023, Chapter 1.A.3.a Aviation 2023			no country-specific EF at hand; no default provided in EMEP/EEA GB 2023, Chapter 1.A.3.a Aviation 2023
	1.A.3.a	PCDD/F	no country-specific EF at hand; no default provided in EMEP/EEA GB 2023, Chapter 1.A.3.a Aviation 2023
		all pollutants	no AD available for multilateral military operations

NFR categories reported as 'included elsewhere ('IE')

NFR category	pollutants effected	included in	explanation / reasoning		
1.A.1.a	B[b]F, B[k]F, I[1,2,3-c,d]P	PAHs 1-4 total	only summarized PAH data available		
1.A.1.b	B[b]F, B[k]F, I[1,2,3-c,d]P	PAHs 1-4 total	only summarized PAH data available		
1.A.1.c	B[b]F, B[k]F, I[1,2,3-c,d]P	PAHs 1-4 total	only summarized PAH data available		
1.A.2.b	$PM_{2.5}$, PM_{10} , TSP, as of 2000 BC, Pb,Cd,Hg,As,Cr,Cu,Ni,Se,Zn, PCCDF, PCCDF B[a]P, B[b]F, B[k]F, I[1,2,3-c,d], PAHs 1-4 total, HCB, PCBs	2.C	considered to be process emissions		

NFR category	pollutants effected	included in	explanation / reasoning
1.A.2.c	all emissions	1.A.2.g viii (energy related emissions), 2.B (process related emissions)	
1.A.2.d	all emissions	1.A.2.g viii (energy related emissions), 2.H.1 (process related emissions)	Process related part include the complete trend of SO_2 emissions instead a fuel based calculation within this category
1.A.2.e	PM _{2.5} , PM ₁₀ , TSP, as of 2000 BC	2.H.2 (process related emissions)	Relevant part of emissions of all pollutants from CHP plants and steam boilers are reported under 1.A.2.g viii, so the whole emissions are adressed
1.A.2.f	NO _x , NMVOC, SOx, PM _{2.5} , PM ₁₀ , TSP, BC, Pb, Cd, Hg, As, Cr, Cu, Ni, Se, Zn,	2.A.1, 2.A.2 and 2.A.6	Process related part include complete trends of these emissions instead a fuel based calculation within this category, For a full overview, please see the table within Non-Metallic Minerals.
1.A.2.g viii	B[b]F, B[k]F, I[1,2,3-c,d]P	PAHs 1-4 total	only summarized PAH data available
1.A.3.d i(ii)	all emissions	1.A.3.d ii	no separate AD available for international inland navigation
2.A.1	CO, B[b]F, B[k]F, I[1,2,3-c,d]P	CO: 1.A.2.f; B[b]F, B[k]F, I[1,2,3-c,d]P in PAHs 1-4 total	only summarized PAH data available
2.A.2	NH ₃	1.A.2.f	
2.A.5.c	PM _{2.5} , PM ₁₀ , TSP, BC	2.L	emissions from storage, handling and transport of dry bulk products reported in NFR 2.L
2.A.6	СО	1.A.2.f	
2.B.10.b	PM _{2.5} , PM ₁₀ , TSP	2.L	emissions from storage, handling and transport of dry bulk products reported in NFR 2.L
2.C.7.d	PM _{2.5} , PM ₁₀ , TSP	2.L	emissions from storage, handling and transport of dry bulk products reported in NFR 2.L
2.1	СО	1.A.2	
3.D.a.2.a	NMVOC	3.B explaination see chapter	
3.D.a.3	NMVOC	3.B explaination see chapter	
2.D.3.b	СО	1.A.2.f	
3.B.4.a	NO _x , NMVOC, NH ₃ , PM _{2.5} , PM ₁₀ , TSP	3.B.1.a, 3.B.1.b	buffaloes included in the population figures for cattle
3.B.4.f	NO _x , NMVOC, NH ₃ , PM _{2.5} , PM ₁₀ , TSP	3.B.4.e	mules and asses are included in population figures for horses

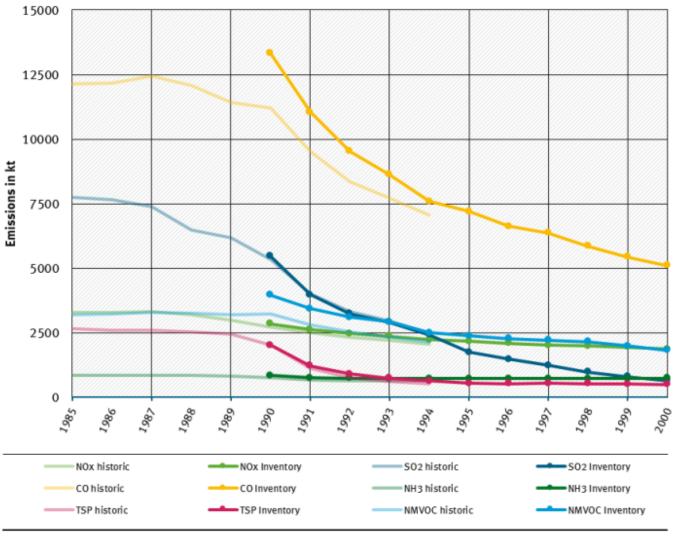
Emission data for years before 1990

Consistent time series for emissions for years before 1990 are not available.

Up to 1994, Germany calculates some sector's emissions separately for both parts of Germany in distinct procedures, using different substructures and data sources. From 1995 onward, the emissions were calculated for the unified country only.

All inventory improvements coming from our own QA/QC or review recommendations can not be applied for the years before 1990. Insofar, the long-time series is provided only as additional information and to illustrate the general trend since 1970.





*Historic data and actual inventory data is not comparable due to changes in methodologies &

Quelle: "Long Rows" ("Lange Reihen") 1970-1994 (Stand/from 1999) / German Emission Inventory 1990-

data sources

Visual comparison of historic data and inventory data for the years 1985 to 2000

2023 (20.03.2025)