

2.G(b) - Other Product use: Tobacco

Short description

In this sub-category of 2.G(b) - Other product use: Tobacco Germany reports NO_x, NH₃, NMVOC, TSP, PM₁₀, PM_{2.5}, Cd, Co, Cu, Ni, Zn, Benzo(a)pyrene (B[a]P), Benzo(b)fluoranthene (B[b]F), Benzo(k)fluoranthene (B[k]F), Indeno(1,2,3-cd)pyrene (I[1,2,3-c,d]P), PAH 1-4 and PCDD/F emissions from the smoking of cigarettes and cigars.

NFR-Code	Name of Category	Method	AD	EF
2.G(b)	Other Product use: Tobacco	T2	NS	CS/D

Method

Activity data: Statistical data from the tax registration of sold tobacco¹⁾, cigarettes and cigars are used as **activity data**.

Emission factors: For the **emission factors**, a study was made and published in October 2016 "Entwicklung von Methoden zur Berechnung von Emissionen von Luftschadstoffen aus der Verwendung von Holzkohle, Tabak, Feuerwerk und Kerzen sowie aus dem Entfachen von Brauchtuumsfeuern" from Nicola Toenges-Schuller et al., AVISO GmbH, for the Umweltbundesamt Germany. Based on this study, most of the EFs are an average value from different studys.

Table 1: Applied emission factors

	Value	Unit	Data source
NO _x	1.8	kg/t tobacco	EMEP/EEA 2013
NMVOC	9.56	kg/t tobacco	average value
NH ₃	5.33	kg/t tobacco	average value
CO	112.51	kg/t tobacco	average value
TSP/PM10/PM2.5	18.85	kg/t tobacco	average value
BC	0.074	kg/t tobacco	average value
Cd	0.0054	kg/t tobacco	EMEP/EEA 2013
Cu	5.4	g/t tobacco	EMEP/EEA 2013
Ni	2.7	g/t tobacco	EMEP/EEA 2013
Zn	2.16	g/t tobacco	average value
PCDD/F	0.1	µg/t tobacco	EMEP/EEA 2013
B[a]P	0.21	g/t tobacco	average value
B[b]F	0.26	g/t tobacco	average value
B[k]F	0.26	g/t tobacco	average value
I[1,2,3-c,d]P	0.42	g/t tobacco	average value

Recalculations

So far for the calculation of the activity data the production, import and export of cigarettes, cigars and tobacco products was used. But because of double counting of tobacco amounts the activity data were overestimated. As new data source for the activity data the sold amount of tobacco registered for the taxes is used.

	Subm2020	Subm2021	Difference
	Activity data	Activity data	
	t	t	t
1990	408.171	169.724	-238.447
1991	435.441	169.724	-265.717
1992	430.880	158.243	-272.637
1993	438.902	147.181	-291.721
1994	452.966	153.485	-299.481
1995	435.306	152.618	-282.688
1996	390.828	155.226	-235.602

	Subm2020	Subm2021	Difference
	Activity data	Activity data	
	t	t	t
1997	381.328	158.332	-222.996
1998	391.045	161.501	-229.544
1999	431.930	170.375	-261.555
2000	336.197	166.077	-170.120
2001	349.237	169.829	-179.408
2002	319.870	176.813	-143.057
2003	334.437	167.661	-166.776
2004	320.141	155.110	-165.031
2005	276.110	150.003	-126.107
2006	276.758	144.814	-131.944
2007	304.975	148.082	-156.893
2008	249.158	136.666	-112.492
2009	216.960	130.702	-86.258
2010	232.027	129.643	-102.384
2011	251.896	136.594	-115.302
2012	251.847	129.331	-122.516
2013	237.208	125.000	-112.208
2014	242.183	125.870	-116.313
2015	250.841	123.250	-127.591
2016	227.667	117.970	-109.697
2017	235.325	117.456	-117.869
2018	235.325	117.026	-118.299

The emissions have changed as follows:

Pollutant	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
BaP	Subm2020	0.09	0.08	0.08	0.09	0.10	0.08	0.08	0.08	0.08	0.09	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.07	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	
BaP	Subm2021	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	
BaP	Difference	-0.05	-0.06	-0.06	-0.06	-0.06	-0.05	-0.05	-0.05	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.03	-0.03	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	
BaP	Subm2020	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	
BaP	Subm2021	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	
BaP	Difference	-0.06	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	
BC	Subm2020	32	28	28	28	29	29	29	29	29	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
BC	Subm2021	11	11	11	11	11	11	11	11	11	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	
BC	Difference	20	17	17	17	18	18	18	18	18	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	
BaP	Subm2020	0.11	0.11	0.11	0.11	0.12	0.11	0.10	0.10	0.10	0.11	0.09	0.09	0.08	0.09	0.08	0.07	0.07	0.08	0.06	0.06	0.06	0.07	0.07	0.06	0.06	0.07	0.06	0.06	
BaP	Subm2021	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	
BaP	Difference	-0.07	-0.07	-0.07	-0.07	-0.08	-0.07	-0.06	-0.06	-0.06	-0.07	-0.04	-0.05	-0.04	-0.04	-0.04	-0.03	-0.03	-0.04	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	
Ca	Subm2020	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
Ca	Subm2021	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	
Ca	Difference	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	
CO	Subm2020	45 304 137	48 394 777	48 394 777	48 394 777	48 394 777	48 394 777	48 394 777	48 394 777	48 394 777	48 394 777	48 394 777	48 394 777	48 394 777	48 394 777	48 394 777	48 394 777	48 394 777	48 394 777	48 394 777	48 394 777	48 394 777	48 394 777	48 394 777	48 394 777	48 394 777	48 394 777	48 394 777		
CO	Subm2021	18 098 137	18 098 137	18 098 137	18 098 137	18 098 137	18 098 137	18 098 137	18 098 137	18 098 137	18 098 137	18 098 137	18 098 137	18 098 137	18 098 137	18 098 137	18 098 137	18 098 137	18 098 137	18 098 137	18 098 137	18 098 137	18 098 137	18 098 137	18 098 137	18 098 137	18 098 137	18 098 137		
CO	Difference	27 206 000	30 296 640	30 296 640	30 296 640	30 296 640	30 296 640	30 296 640	30 296 640	30 296 640	30 296 640	30 296 640	30 296 640	30 296 640	30 296 640	30 296 640	30 296 640	30 296 640	30 296 640	30 296 640	30 296 640	30 296 640	30 296 640	30 296 640	30 296 640	30 296 640	30 296 640	30 296 640	30 296 640	
Cu	Subm2020	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	
Cu	Subm2021	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	
Cu	Difference	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	
NaP	Subm2020	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	
NaP	Subm2021	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	
NaP	Difference	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
NH3	Subm2020	2313.13	2313.13	2313.13	2313.13	2313.13	2313.13	2313.13	2313.13	2313.13	2313.13	2313.13	2313.13	2313.13	2313.13	2313.13	2313.13	2313.13	2313.13	2313.13	2313.13	2313.13	2313.13	2313.13	2313.13	2313.13	2313.13	2313.13	2313.13	
NH3	Subm2021	604.40	604.40	604.40	604.40	604.40	604.40	604.40	604.40	604.40	604.40	604.40	604.40	604.40	604.40	604.40	604.40	604.40	604.40	604.40	604.40	604.40	604.40	604.40	604.40	604.40	604.40	604.40	604.40	
NH3	Difference	1708.73	1708.73	1708.73	1708.73	1708.73	1708.73	1708.73	1708.73	1708.73	1708.73	1708.73	1708.73	1708.73	1708.73	1708.73	1708.73	1708.73	1708.73	1708.73	1708.73	1708.73	1708.73	1708.73	1708.73	1708.73	1708.73	1708.73	1708.73	
Ni	Subm2020	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	
Ni	Subm2021	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	
Ni	Difference	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	
NH4NO3	Subm2020	3.903.28	4.184.06	4.120.43	4.127.16	4.335.65	4.162.77	3.737.43	3.646.58	3.739.55	4.135.48	3.715.53	3.339.73	3.058.87	3.198.17	3.061.46	2.640.45	2.646.50	2.616.43	2.382.66	2.074.74	2.218.84	2.408.85	2.408.38	2.268.38	2.315.96	2.398.76	2.177.14	2.255.38	2.258.38
NH4NO3	Subm2021	1.621.03	1.623.05	1.533.26	1.457.47	1.467.76	1.459.46	1.484.46	1.516.13	1.544.43	1.629.27	1.588.17	1.643.65	1.693.44	1.653.32	1.483.30	1.434.46	1.394.44	1.474.50	1.306.82	1.298.88	1.279.78	1.356.23	1.295.77	1.195.38	1.254.68	1.178.82	1.128.33	1.112.22	1.119.10
NH4NO3	Difference	2.282.25	2.561.01	2.607.18	2.669.69	2.867.89	2.703.31	2.252.97	2.132.48	2.195.09	2.501.22	2.127.36	1.696.08	1.365.43	1.515.85	1.178.16	1.206.00	1.252.06	1.141.93	0.775.84	0.775.86	1.139.06	1.112.65	1.072.61	1.119.28	1.216.14	1.049.63	1.064.92	1.143.16	1.139.28
NH4	Subm2020	738.73	793.78	775.58	775.58	815.34	793.49	688.39	703.86	777.47	805.35	628.83	575.77	601.99	576.20	497.08	498.35	548.85	448.46	395.53	412.65	453.43	453.57	459.88	453.58	459.88	453.58	459.88	453.58	
NH4	Subm2021	305.58	305.58	284.84	284.84	276.27	274.73	279.43	285.02	296.70	306.68	268.44	265.69	318.26	301.79	279.26	279.03	286.87	266.53	248.04	235.20	233.36	245.87	232.88	225.00	221.83	212.35	211.42	210.65	
NH4	Difference	433.15	488.20	490.74	490.74	539.07	508.46	408.96	418.86	480.77	498.69	360.22	310.08	283.23	277.41	217.82	219.32	262.32	2											
PM10	Subm2020	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PM10	Subm2021	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	
PM10	Difference	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	
PM2.5	Subm2020	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	
PM2.5	Subm2021	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.1		