1.A.4.c iii - Agriculture/Forestry/Fishing: National Fishing

Short description

In category *1.A.4.c iii* the emissions of Germany's maritime fishing fleet are reported.

Method	AD	EF	Key Category Analysis
T1, T2	NS, M	D, M, CS, T1, T2	*no key category*

Methodology

Activity Data

Primary fuel delivery data for national fishing is included in NEB lines 6 ('International Deep-Sea Bunkers') and 64 ('Coastal and Inland Navigation') for IMO-registered and unregistered ships respectively.

The actual annual amounts used are therefore calculated within (Deichnik (2019)), where ship movement data (AIS signal) allows for a bottom-up approach providing the needed differentiation.[1)]

Table 1: Annual fuel consumption, in terajoules

	= 1990	= 1995	= 2000	= 2005	= 2010	= 2011	= 2012	= 2013	= 2014	= 2015	= 2016	= 2017	= 2018
~ Diesel Oil	> 711	> 549	> 531	> 488	> 473	> 442	> 431	> 429	> 472	> 555	> 1.117	> 1.208	> 2.455
~ Biodiesel	> 0	> 0	> 0	> 4	> 12	> 11	> 11	> 10	> 10	> 10	> 8	> 8	> 8
~ Heavy Fuel Oil	> 24	> 18	> 18	> 16	> 16	> 15	> 14	> 14	> 13	> 0	> 0	> 0	> 0
Σ 1.A.4.c iii	~ 735	~ 567	~ 549	~ 508	~ 500	~ 467	~ 456	~ 452	~ 496	~ 565	~ 1,126	~ 1,216	~ 2,463

> The strong increase after 2015 cannot be conclusively explained at the moment.
> However, even if the over-all fuel quantities delivered to the navigation sector would be somehow misallocated between the specific nautical acitivities, there would be no over- or under-estimation of emissions.

gallery size="medium" : 1A4ciii_AD.png : 1A4ciii_AD_bio.png : 1A4ciii_AD_HFO.png gallery

++ Emission factors

The emission factors applied here, are derived from different sources and therefore are of very different quality.

For the main pollutants, country-specific implied values are used, that are based on tier3 EF included in the BSH model [2)] which mainly relate on values from the EMEP/EEA guidebook 2016 [3)]. These modelled IEFs take into account the ship specific information derived from AIS data as well as the mix of fuel-qualities applied depending on the type of ship and the current state of activity.

Table 2: Annual country-specific emission factors, in kg/TJ

	= 1990	= 1995	= 2000	= 2005	= 2010	= 2011	= 2012	= 2013	= 2014	= 2015	= 2016	= 2017	= 2018
< Diesel fuels	**1**												
~ NH,,3,,	> 0.32	> 0.32	> 0.32	> 0.32	> 0.32	> 0.32	> 0.32	> 0.32	> 0.32	> 0.32	> 0.32	> 0.32	> 0.32
~ NMVOC	> 50.0	> 50.0	> 50.0	> 50.0	> 50.0	> 50.0	> 50.0	> 49.8	> 50.4	> 49.6	> 50.7	> 51.5	> 52.9
~ NO,,x,,	> 1,099	> 1,099	> 1,099	> 1,099	> 1,099	> 1,099	> 1,099	> 1,090	> 1,090	> 1,092	> 1,092	> 1,091	> 1,093
~ SO,,x,,	> 466	> 419	> 233	> 186	> 70	> 65	> 56	> 53	> 50	> 42	> 42	> 42	> 43

~ PM	> 291	> 262	> 145	> 116	> 44	> 41	> 41	> 43	> 41	> 43	> 40	> 39	> 36		
~ BC	**3**		> 84.2	> 75.8	> 42.1	> 33.7	> 12.6	> 11.8	> 11.8	> 12.3	> 12.0	> 12.4	> 11.7	> 11.2	> 10.4
~ CO	> 102	> 102	> 102	> 102	> 102	> 102	> 102	> 106	> 103	> 107	> 101	> 96	> 90		
< **Heavy fuel oil**															
~ NH,,3,,	> 0.33	> 0.33	> 0.33	> 0.33	> 0.33	> 0.33	> 0.33	> 0.34	> 0.35	= NA	= NA	= NA	= NA		
~ NMVOC	> 33.2	> 33.2	> 33.2	> 33.2	> 33.2	> 33.2	> 33.2	> 30.6	> 30.2	= NA	= NA	= NA	= NA		
~ NO,,x,,	> 1,187	> 1,187	> 1,187	> 1,187	> 1,187	> 1,187	> 1,188	> 1,283	> 1,287	= NA	= NA	= NA	= NA		
~ SO,,x,,	> 1.319	> 1.332	> 1.323	> 1.336	> 496	> 496	> 496	> 496	> 506	= NA	= NA	= NA	= NA		
~ PM,,2.5,,	**2**		> 469	> 474	> 471	> 475	> 176	> 176	> 176	> 149	> 149	= NA	= NA	= NA	= NA
~ PM,,10,,	> 516	> 521	> 518	> 523	> 194	> 194	> 194	> 164	> 164	= NA	= NA	= NA	= NA		
~ TSP	> 516	> 521	> 518	> 523	> 194	> 194	> 194	> 164	> 164	= NA	= NA	= NA	= NA		
~ BC	**3**	´	> 56.3	> 56.8	> 56.5	> 57.0	> 21.2	> 21.2	> 21.2	> 17.9	> 17.9	= NA	= NA	= NA	= NA
~ CO	> 182	> 182	> 182	> 182	> 182	> 182	> 182	> 158	> 165	= NA	= NA	= NA	= NA		
1															
2															
3															

NOTE: For the country-specific emission factors applied for particulate matter, no clear indication is available, whether or not condensables are included.

For information on the **emission factors for heavy-metal and POP exhaust emissions**, please refer to Appendix 2.3 - Heavy Metal (HM) exhaust emissions from mobile sources] and Appendix 2.4 - Persistent Organic Pollutant (POP) exhaust emissions from mobile sources].

Trend discussion for Key Sources

NFR 1.A.4.c iii - National Fishing is **no key source**.

Recalculations

Recalculations occur only to the revised **activity data** reported for 2016 and 2017. Here, due to a revision of the official blending rates, the amounts of biodiesel used in NFR 1.A.4.c iii have been revised for 2016 and 2017.

Table 3: Revised biodiesel consumption estimates 2016 and 2017, in terajoules

=		= **Biodiesel**		
=	= **2016**	= **2017**		
~ Submission 2020	> 8.49	> 7.82		
~ Submission 2019	> 7.88	> 8.11		
~ absolute change	> 0.61	> -0.29		
~ relative change	> 7.77%	> -3.57%		

All **emission factors** remain unrevised, instead.

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.

Uncertainties

Uncertainty estimates for **emission factors** were adopted from NFR 1.A.3.d i as a comparable emission source.

Planned improvements

> Besides a routine revision of the BSH model, further focus will be put on the correct allocation of actvity data to the different navigation activities covered in different NFR sub-sectors.

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bibliography : 1 : Deichnik (2019): Aktualisierung und Revision des Modells zur Berechnung der spezifischen Verbräuche und Emissionen des von Deutschland ausgehenden Seeverkehrs. from Bundesamts für Seeschifffahrt und Hydrographie (BSH); Hamburg, 2019. : 2 : EMEP/EEA, 2019: EMEP/EEA air pollutant emission inventory guidebook – 2019; Chapter 1.A.3.d.i, 1.A.3.d.ii, 1.A.4.c.iii Navigation; URL: https://www.eea.europa.eu/publications/emep-eea-guidebook-2019/part-b-sectoral-guidance-chapters/1-energy/1-a-combustion/1-a-3-d-navigation : 3 : Rentz et al., 2008: Nationaler Durchführungsplan unter dem Stockholmer Abkommen zu persistenten organischen Schadstoffen (POPs), im Auftrag des Umweltbundesamtes, FKZ 205 67 444, UBA Texte | 01/2008, January 2008; URL: https://www.umweltbundesamt.de/en/publikationen/nationaler-durchfuehrungsplan-unter-stockholmer bibliography

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[1)] (bibcite 1)
[2)] (bibcite 1)
[3)] (bibcite 2)