Für Mensch & Umwelt

Umwelt Bundesamt

Combustion and Industry Expert Panel

The fugitive sector in the Guidebook

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Coal Mining and Handling

MISSING REFERENCE TO IMPORTED COAL

Some countries report under 2.L “Other production, consumption etc of bulk products”

No clear description in Guidelines

-> Proposal: apply current emissions factors for handling and storage

https://www.liebherr.com/de/int/produkte/maritime-krane/port-equipment/anwendungsbereiche/

Coal in Europe 2021

lignite production, hard coal production & imports

EU-27	million tonnes
lignite	275
hard coal	57
imports	106

https://public.euracoal.eu/download/Public-Archive/Library/Charts-Maps/Coal-in-Europe/EURACOAL-Coal-in-Europe-2021-01.pdf

Keep it under 1.B.1 or better report it under 2.L?

Coal Mining and Handling

DUE TO CONSISTENCY REASONS NO NEW FACTORS INTRODUCED

REVISION OF REFERENCES IS DIFFICULT – ASSUMPTIONS ARE NOT DOCUMENTED

Ideas for better documentation?

Split Tier-1 factors into mining and handling to account for imported coal?

Example

Original reference shows values from mining and handling

For TSP is
0,051 kg / t (mining)
0,15 kg / t (storage)

Sum = 0,21 kg/t

Reference in GB is 0,089 kg/t

Table 3-1 → Tier 1 emission factors for source category 1.B.1.a Coal mining and handling

Tier 1 default emission factors					
	Code	Name			
NFR Source Category	1.B.1.a	Coal mining and handling			
Fuel	NA				
Not applicable	NOx, CO, SOx, NH3, PCB, PCDD/F, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Indeno(1,2,3-cd)pyrene, HCB, HCH				
Not estimated	Pb, Cd, Hg, As, Cr, Cu, Ni, Se, Zn, BC				
Pollutant	Value	Unit	95% confidence interval		Reference
			Lower	Upper	
NMVOC	0.8	kg/Mg coal	0	6.4	EMEP/EEA (2006)
TSP	0.089	kg/Mg coal	0.0091	0.91	US EPA (1998), Visschedijk et al. (2004) applied in Peutz (2006)
PM10	0.042	kg/Mg coal	0.0044	0.44	US EPA (1998), Peutz (2006), Vrins (1999)
PM2.5	0.005	kg/Mg coal	0.0007	0.07	US EPA (1998), Visschedijk et al. (2004) applied in Peutz (2006)

Coal Mining and Handling

NMVOC VALUES ARE OVERESTIMATING EMISSIONS FROM LIGHNITE MINING

Lignite usually have a low VOC content

Guidebook differentiate between open cast and underground only

Split Tier-1 factors into lignite and hardcoal to avoid over-/underestimation of NMVOC?

Any recent studies on ethane and propane content of lignite?

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Methane 0,011 kg/ t lignite
(German inventory)

Methane 0,019 kg/ t open cast mined coal
(EMEP 2006, values from Poland)

In contrast:

NMVOC 0,8 kg/t (70 times the value of CH4)

Abandoned mines

IPCC GUIDELINES PROVIDE LONG CHAPTER FOR UNDERGROUND MINES

As long as mine is not flooded it can be considered as gassy

Any ideas on open cast mines?

Open pits a source of particles?

https://www.ecowoman.de/alternative-energiespeicher-energiewende-bergwerke-werden-saubere-energie-5023

https://www.deutschlandfunk.de/kohleabbau-in-sibirien-ein-dorf-leistet-widerstand-100.html

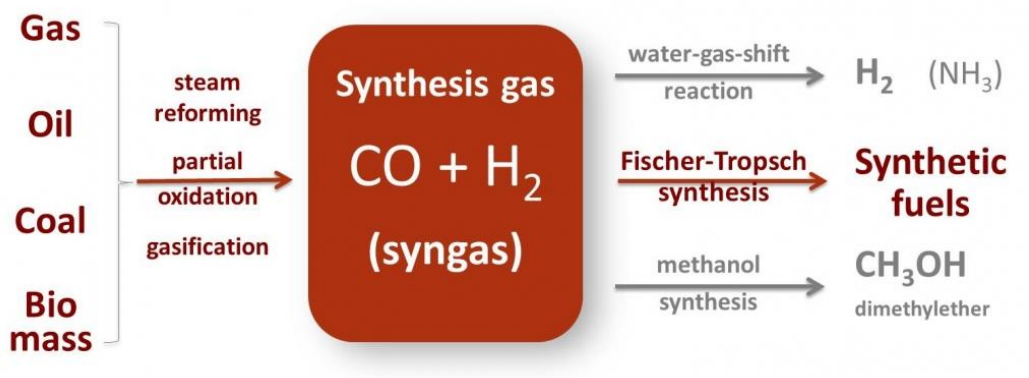
Fuel Transformation

IPCC REFINEMENT INTRODUCED SEVERAL “NEW” PROCESSES

Implemented: CHARCOAL AND BIOCHAR PRODUCTION

Any ideas on gasification processes (syngas)?

Already covered by 2.B. (Chemical Industry)?



https://www.syngaschem.com/the-chemistry/

Gaseous Fuels

Replace ancient numbers on composition – any measurments?

Any measurments from LNG?

CURRENT FACTORS ARE PREHISTORIC

Used the IPCC factors to differentiate between conventional and unconventional production

Not possible to get a confidence interval -> took the range from the IPCC instead

For the EU the EU methane regulation will provide tier 3 factors for methane

Update gas composition to get better values for non-GHG?

Extend table for LNG export countries?

Table 2-1 → Typical species profile for the emissions from gas distribution networks

	UK[1]	Netherlands[2]	Germany[3]	France[3]
Carbon dioxide (CO_2)	0.5	5.0	2.2	0.9
Nitrogen (N_2)	2.5	6.1	7.6	4.5
Methane (CH_4)	92.5	84.7	85.5	88.6
Ethane (C_2H_6)	2.9	3.8	3.3	4.7
Propane (C_3H_8)	0.9	0	0.9	0.8
2-methylpropane (C_4H_{10})	0.2	0.1	0	0
Butane (C_4H_{10})	0.2	0.1	0.4	0.2
2,2-dimethylpropane (C_5H_{10})	0.1	0	0	0
2-methylbutane (C_5H_{12})	0.1	0.1	0	0
Pentane (C_5H_{12})	0.1	0.0	0.1	0.3
Hydrogen sulphide (H_2S)	0	0.1	0	0
Total mole %	100	100	100	100

Notes
1. → [1] Gas quality (1986).
2. → [2] Procestechniek (1987).
3. → [3] International Gas Union (1976).

Oil Products

DISTRIBUTION OF OIL PRODUCTS

Factors include gasoline – other products disregarded

Chemical products (like naphtha) -> needs reference where to report

Where to report naphtha?

reasonable to provide tier-1 factors for other fuels?

https://www.tagesschau.de/wirtschaft/verbraucher/spritpreise-nach-tankrabatt-101.html

Thank you for your attention

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www.uba.de/emissionen