For our Environment

Umwelt Bundesamt

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Development National Air Quality Plan: Germany

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Section II 4.1 / General Aspects of Air Quality Control

with support from Andreas Eisold

Outline

- Responsibilities and general time-table

- Underlying submission for emission projections

- Database on emission reduction measures (EMMa)

- Spatial gridding of projected emissions

- Modelling of projected air quality

- Consultation processes

Responsibilities

- Umweltbundesamt (German EPA) is responsible for drafting the plan (i. e. mainly responsible for emission projections and air quality modelling)

- Ministry of Enviroment (MoE) is responsible for interservice consultation within German government and consultation processes

General time-table

- Development of updated WM- and WAM-scenarios (nearly finished, done by UBA/contractor, according to Article 8 (2) of the new NEC-Directive)

- If WAM-scenario does not comply with reduction commitments, an updated WAM-scenario will be developed ('NECC'-scenario, until end of June 2018, done by UBA/contractor, according to Article 8 (2) of the new NEC-Directive)

- Modelling of impacts on air quality and ecosystems (until end of September 2018, done by UBA/contractor, according to Article 6 (2) of the new NEC-Directive)

- Interservice consultation within German government
  (done by MoE, until end of 2018)

- Consultation processes (done by MoE, until end of 2018, according to Article 6 (5) of the new NEC-Directive)

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Underlying submission for emission projections

- Development of WM/WAM-scenarios started in 2017 (using submission 2017 as reference)

- Due to substantial changes from recalculations we will now use submission 2018 as reference

Recalculations in current submission

https://iir-de.wikidot.com/recalculations

Table 1: Overview of impact of recalculations on the level of National Totals
(For more detailed information please mouseclick the pollutant.)

for reporting year:		Base Year[1]		Change			2015		Change	
in NFR submission:		2017	2018	absolute	relative		2017	2018	absolute	relative
Main pollutants										
NEC										
Nitrogen Oxides - NOx	[kt]	2,883.4	2,888.5	5.01	0.17%		1,187.4	1,240.8	53.30	4.49%
Non-Methane VOC - NMVOC	[kt]	3,389.7	3,401.6	11.95	0.35%		1,020.2	1,039.2	18.98	1.86%
Sulfur Oxides - SOx	[kt]	5,484.9	5,485.8	0.89	0.02%		351.8	364.1	12.34	3.51%
Ammonia - NH3	[kt]	793.1	742.8	-50.32	-6.35%		759.3	670.3	-88.97	-11.72%
Particulate Matter										
Particles <2.5µm PM2.5	[kt]	194.8	196.5	1.70	0.87%		99.5	103.2	3.67	3.69%
Particles <10µm - PM10	[kt]	329.0	327.6	-1.41	-0.43%		221.3	213.7	-7.63	-3.45%
Total Suspended Particles - TSP	[kt]	1,970.2	1,985.3	15.05	0.76%		359.8	369.4	9.58	2.66%
Black Carbon - BC	[kt]	35.8	35.7	-0.11	-0.31%		14.7	14.6	-0.10	-0.64%

higher emission factors for diesel passenger cars from HBEFA 3.3

lower emission factors for application of inorganic N-fertilizers from EMEP Guidebook 2016

Database on emission reduction measures (EMMa)

- Directly coupled to the database used to calculate the national emissions for the national inventory report

- Activity data are initially coherent to other policies/reporting requirements (e. g. reporting on national projections of anthropogenic greenhouse gas emissions under Directive 525/2013)

- Current status of EMMa
  - done: agriculture, transport, solvent use
  - to be done: e. g. implementing the LCP-BREF regulations as well as further BREFs and BAT-conclusions for WM-scenario; gathering data to make reasonable assumptions on emission factors for WAM-scenario

Database on emission reduction measures (EMMa)

Simplified example (for a single NFR sector)

		2005	2016	2020	2025	2030
NIR (subm. 2018)	A	5	5			
	EF/IEF	5	5			
	E	**25**	**25**			
WM-scenario	A			4	3	4
M 1	EF			5	4	4
M 2	EF			25	20	15
M 3	EF			5	4	4
Combined M 1 - M 3	IEF			5	5	4
	E			**20**	**15**	**16**
WAM-scenario	A			4	3	3
M 4	EF			20	18	16
M 5	EF			10	8	6
Combined M 1 - M 5	IEF			5	4	3
	E			**20**	**12**	**9**

NIR: National Inventory Report, A: Activity, EF: Emission Factor, IEF: Implied Emission Factor, M: Measure

## Additional issues of projected emission datasets

- As soon as PaMs targeting emissions of air pollutants are also affecting activities, WM as well as WAM reported according to NECD 2016/2284 will not be the same as WM and WAM reported according to Directive 525/2013.

- The combination of measures will not cause the same reduction as addition of reduction potentials of all single measures.

- Projected reduction of the selected PaMs in WAM must be finally estimated after all consultation processes leading to the final selection.

- Air quality modelling will be done with a preliminary emission dataset.

Conversion of projected emissions for air quality modelling

- **energy balance principle**
  emissions from the burning of fuels sold in a country (standard for international reporting of emissions and for proof of compliance with international agreements on air pollution control)
- **domestic principle**
  only incorporates the emissions within the geographical borders of a country

1. Emissions projection (**energy balance principle**)

2. Conversion of projected emissions to domestic principle

3. Spatial distribution of projected emissions (**domestic principle**) as input for air quality modelling

There is a need of four activity projections: **Domestic principle and Energy balance principle, each for WM- and WAM-scenario.**

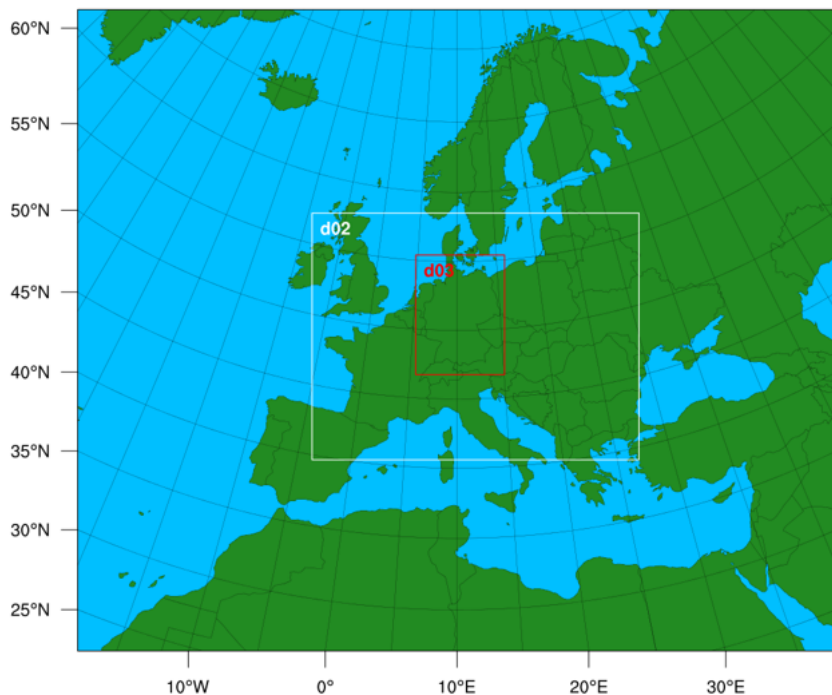# Spatial gridding of projected emissions with GRETA
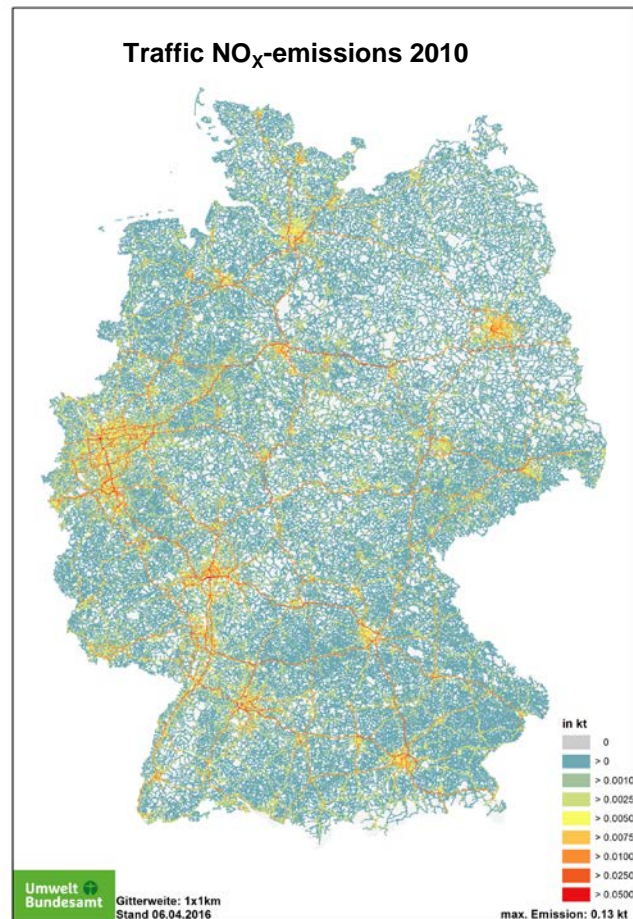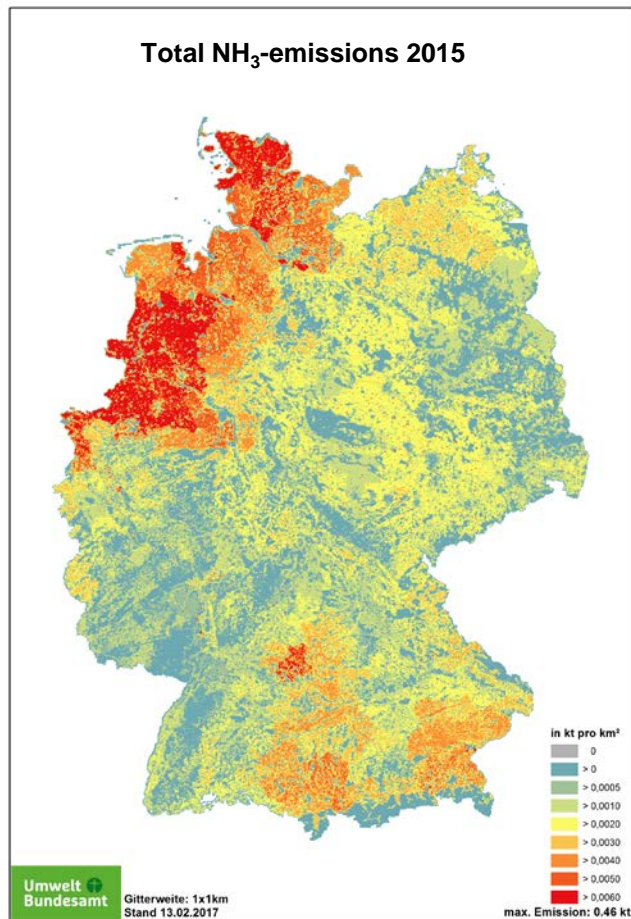
How can we consider regionalized effects of projected emission reductions in WM and WAM (e. g. spatial configuration of large point sources)?

Modelling of projected air quality

- CTM = EURAD with 2x2 km² resolution
- Regional air quality (concentration and deposition) in 2020, 2025 and 2030 and comparison with 2005
- Evaluation of hot-spot concentrations with occasional input from regional/local authorities

WPS Domain Configuration

year	meteorology	emissions Europe	emissions Germany
2005	2005	TNO-MACC-II 2005	GRETA
2015a	2005	TNO-CAMS	GRETA
2015b	2015	TNO-CAMS	GRETA
2020a	2005	IIASA-CLE	GRETA-WM
2020b	2005	IIASA-MTFR (?)	GRETA-WAM
2025a	2005	IIASA-CLE	GRETA-WM
2025b	2005	IIASA-MTFR (?)	GRETA-WAM
2030a	2005	IIASA-CLE	GRETA-WM
2030b	2005	IIASA-MTFR (?)	GRETA-WAM

Modelling of projected air quality:
Transboundary impact of domestic emission sources

- National emission data set is not consistent with existing European datasets.

- Could the gridded WM - and WAM-emissions of all EU-states compiled to a new European dataset?

- This could be used for an updated NAPCP.

year	meteorology	emissions Europe	emissions Germany
2005	2005	TNO-MACC-II 2005	GRETA
2015a	2005	TNO-CAMS	GRETA
2015b	2015	TNO-CAMS	GRETA
2020a	2005	IIASA-CLE	GRETA-WM
2020b	2005	IIASA-MTFR (?)	GRETA-WAM
2025a	2005	IIASA-CLE	GRETA-WM
2025b	2005	IIASA-MTFR (?)	GRETA-WAM
2030a	2005	IIASA-CLE	GRETA-WM
2030b	2005	IIASA-MTFR (?)	GRETA-WAM

Consultation processes

- Interservice consultation within German government (e. g. with agriculture, traffic and economic departments), especially to ensure coherence with relevant policies

- Consultation with other stakeholders (e. g. regional/local authorities, associations from different sectors, NGOs) will be done using an established process, which is currently applied during every German legislation in the field of air quality

- Consultation of a broader public, e. g. to enhance the general acceptance of measures, is planned during the update process of the NAPCP

Thank you very much for your attention!

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http://www.umweltbundesamt.de/en/topics/air