

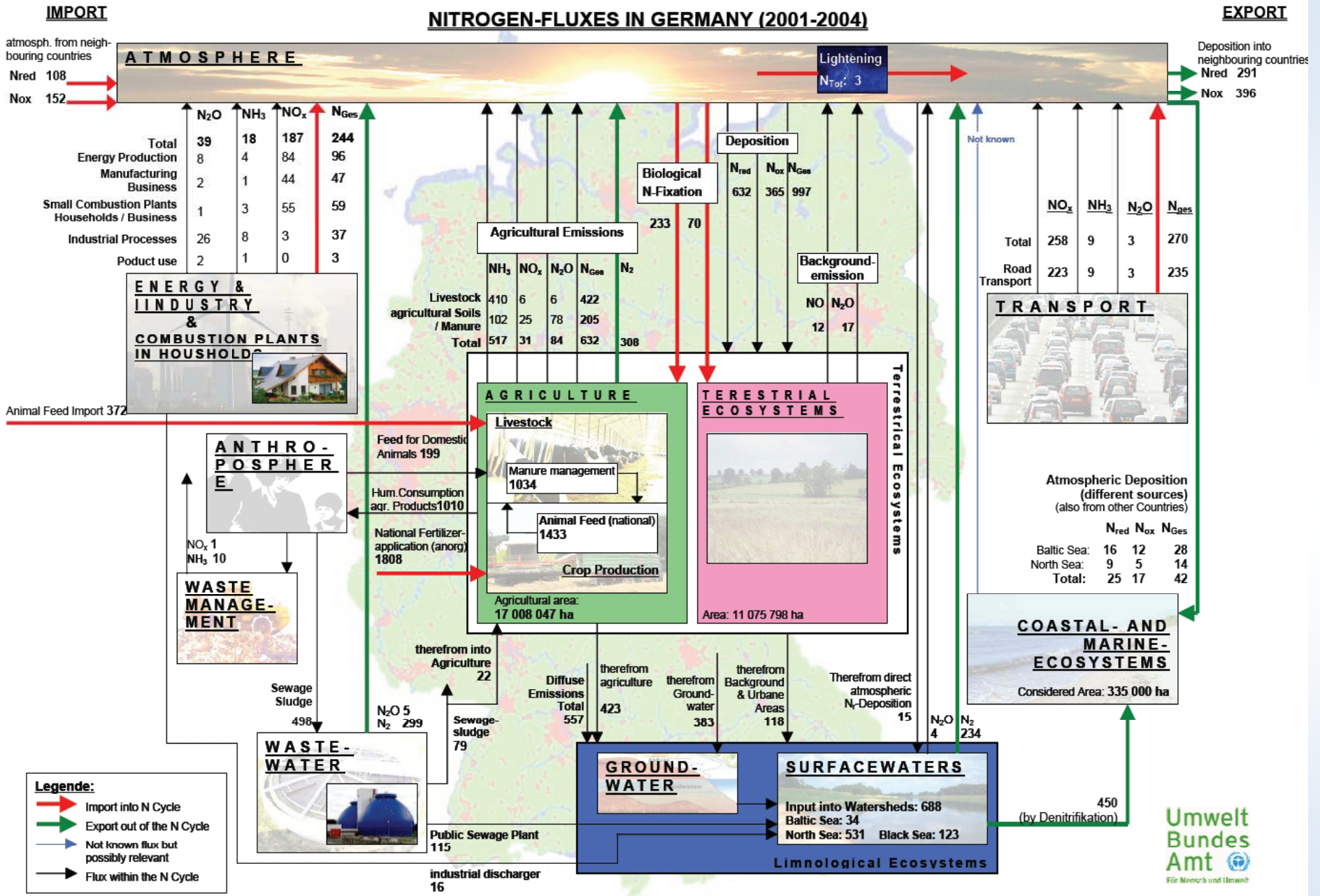
Updating the National Nitrogen Budget of Germany

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NITROGEN-FLUXES IN GERMANY (2001-2004)



Legende:
 → Import into N Cycle
 → Export out of the N Cycle
 → Not known flux but possibly relevant
 → Flux within the N Cycle



Method of Updating

- Quantitative nitrogen fluxes with minimum of 1 Gg a⁻¹,
- Data average of years 2005 – 2007,
- Including new available data.
- Tool for national N-budgeting (Adrian Leip).

Agriculture

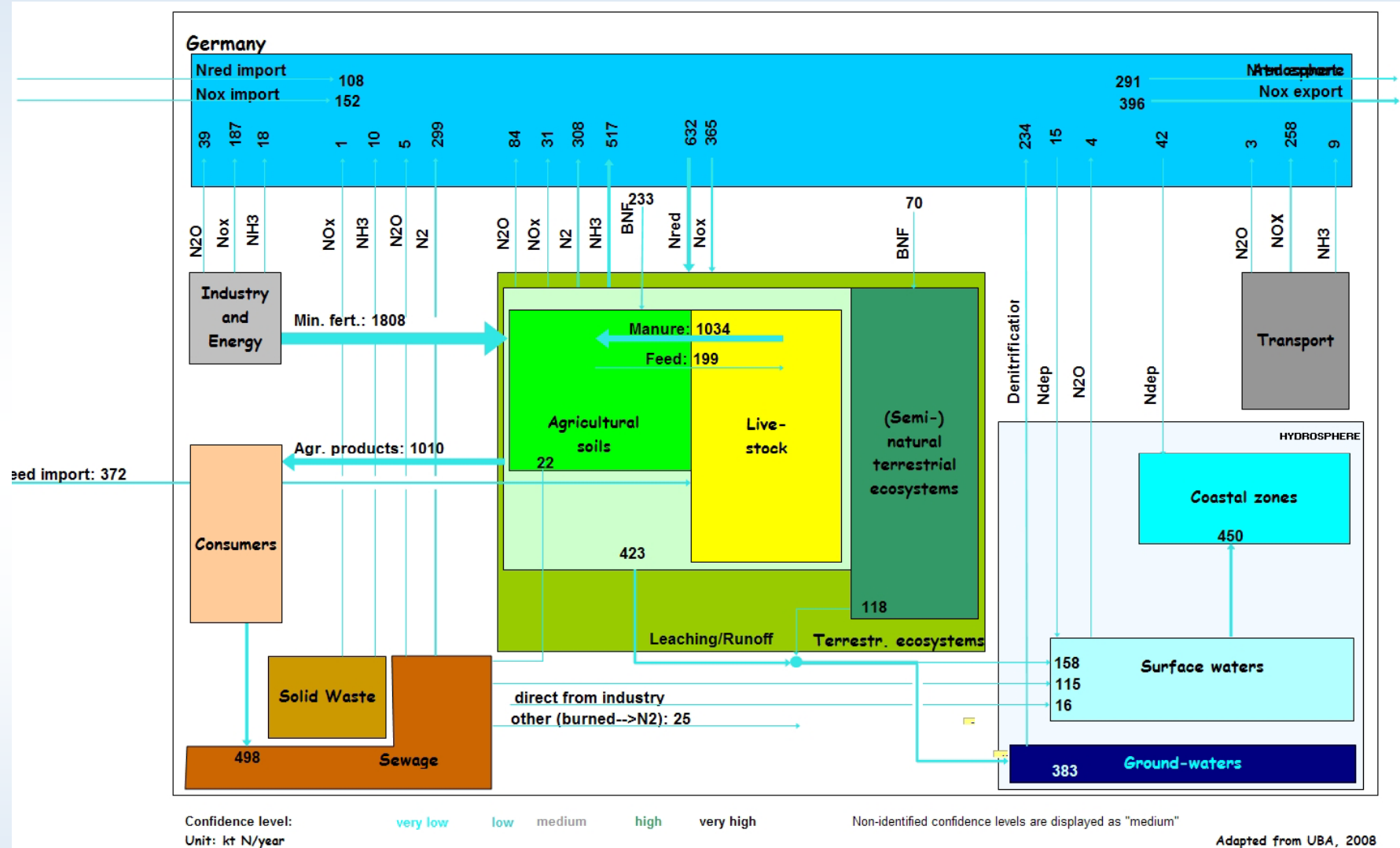
Input mineral fertilizer	1808
- thereof imported (export see above)	
Input other	
Manure excretion (total)	1034
Manure application (net of losses in animal sector, see below)	
Manure export	
Atmospheric deposition (see also below)	
Biological N-fixation	233
Total crop production	
- used to feed for domestic animals	199
-- grass/grazing	
-- other feed crops	
- Total non-feed crops	
-- crop products for domestic human consumption	661
-- Net trade of agricultural products (export - import)	
-- use in industry	
- internal recycling (crop residues, seed, losses on farm)	
- other use of crop products? (specify under comment!)	
Total animal products	
- animal products for domestic human consumption	349
- Net trade of animal products (export - import)	
- use in industry	
- internal recycling (crop residues, seed, losses on farm)	
- animal products other? (specify under comments)	
Net trade of food (import-export)	
Net trade of feed (import-export)	372
Net trade crop + animalproducts + feedstuff	
Net trade of agricultural commodities for industry etc. (import-export)	
Human consumption	1010

Agriculture

Input mineral fertilizer	1721
- thereof imported (export see above)	
Input other	
Manure excretion (total)	870
Manure application (net of losses in animal sector, see below)	
Manure export	
Atmospheric deposition (see also below)	411
Biological N-fixation	211
Seeds and Planting Material	24
domestic seeds	10
seeds import	14
Total crop production	
- used to feed for domestic animals	696
-- grass/grazing	
-- other feed crops	
Feed Import	363
- Total non-feed crops	
-- crop products for domestic human consumption	1098
-- Net trade of agricultural products (export - import)	
-- use in industry	
- internal recycling (crop residues, seed, losses on farm)	
- other use of crop products? (specify under comment!)	
Total animal products	
- animal products for domestic human consumption	361
- Net trade of animal products (export - import)	
- use in industry	

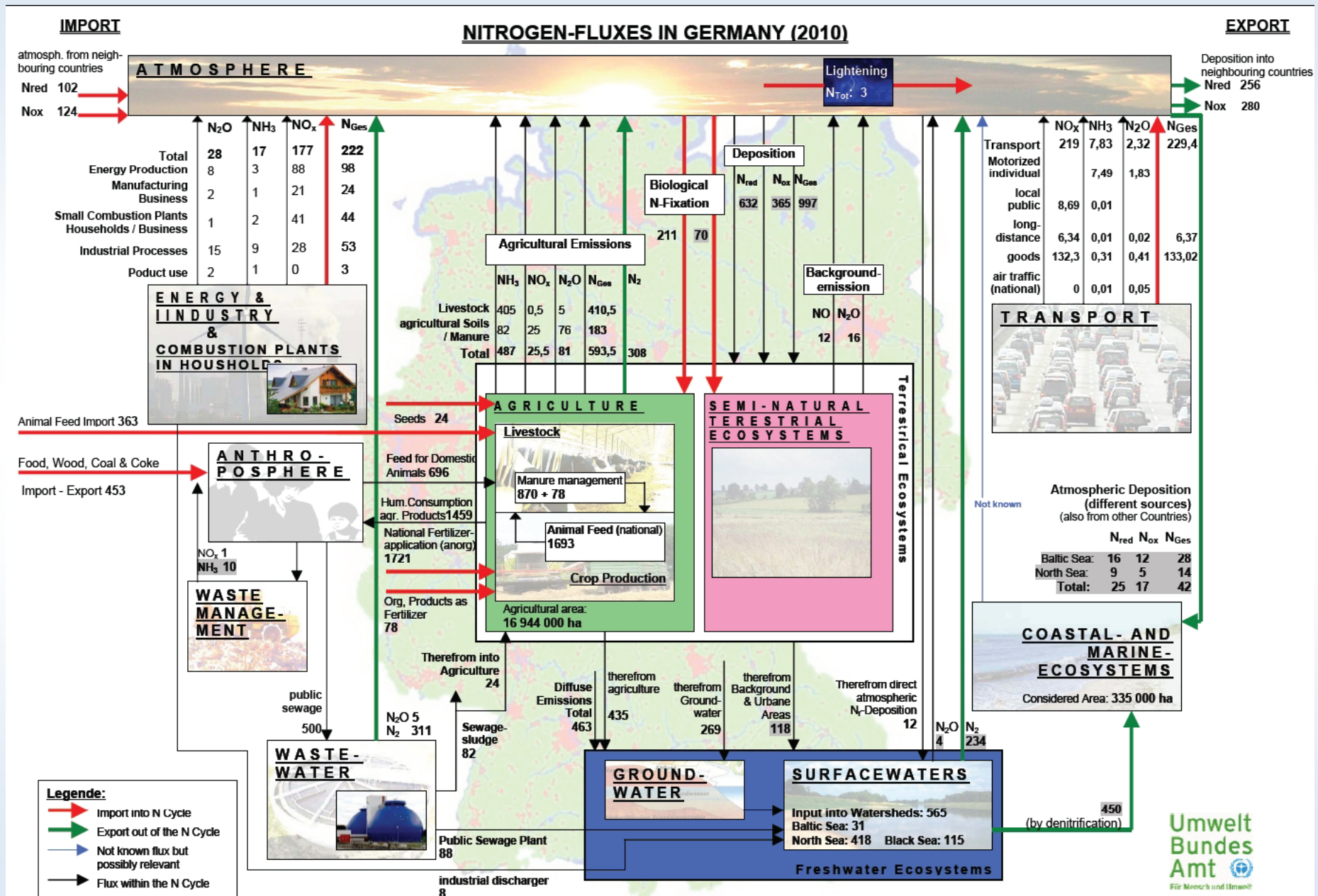
Tool for national N-budgeting
(Gg a⁻¹) (Adrian Leip)

National N-budgeting map



Tool for national N-budgeting
 (Gg /a) (Adrian Leip)

Preliminary results: national N-budgeting map (Gg / a)



Preliminary results: national N-budgeting update

(Gg N/ a)	2001-2004	2005-2007
Organic products as fertilizer		78
Sewage Sludge (Total)	79	82
Sewage Sludge in Agriculture	22	24
Urban compost		28
Industrial Waste Products (Tiermehle)		12
Imported organic Fertilizer /Gülle NL)		13

(Gg N/a)	2001-2004	2005-2007
Seeds and Planting Material		24
Domestic seeds		10
Seeds import		14

Preliminary results: national N-budgeting update

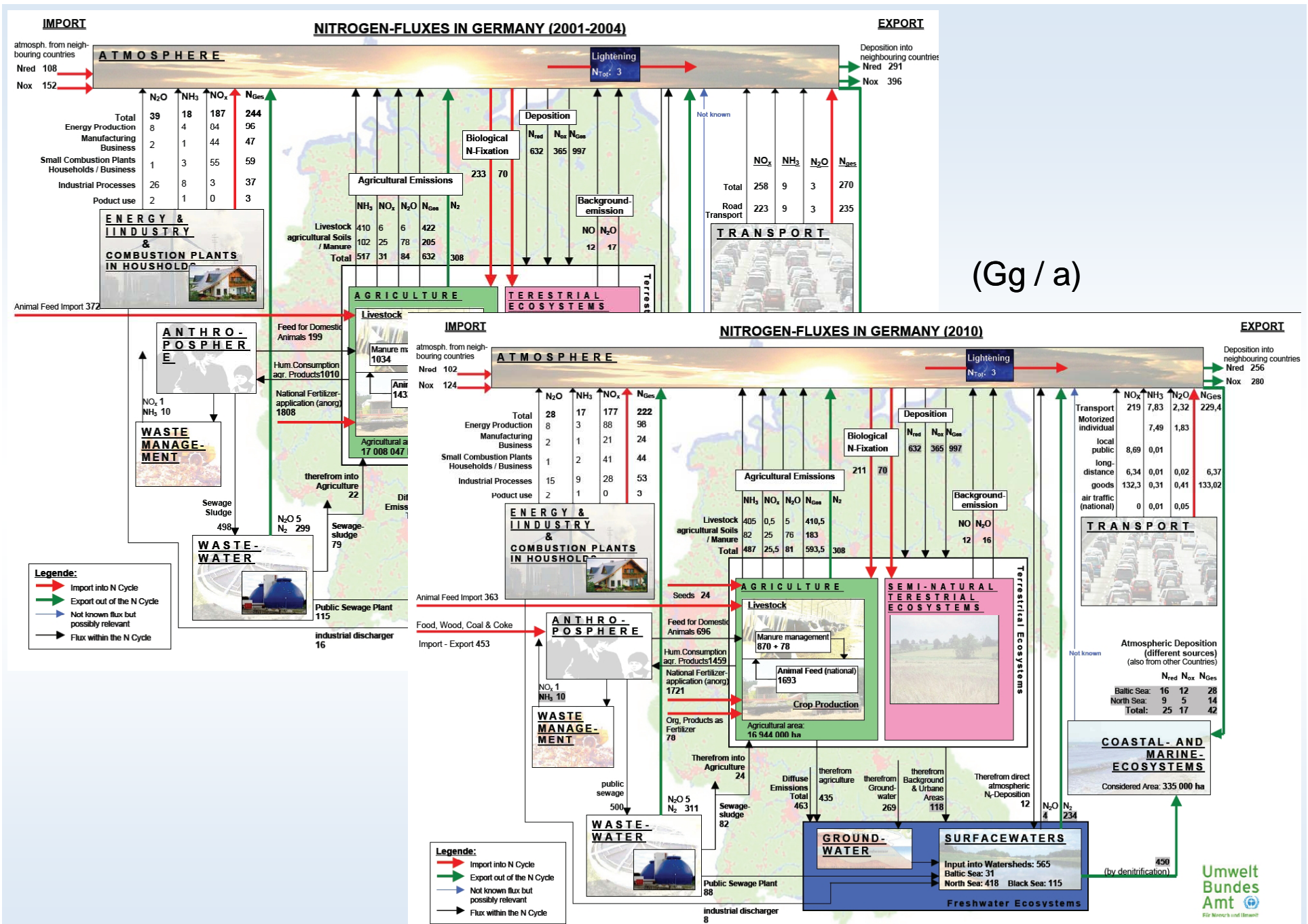
<u>Transport [Gg N]</u>		2001-2004	2005-2007
	(Gg N/a)		
Emissions of N2O		3	2,32
thereof:	Motorized individual transport		1,83
	Local public transport		0,02
	Long-distance passenger transport		0,02
	Transport of goods		0,41
	Air traffic (interior)		0,05
Emissions of NH3		9	7,83
thereof:	Motorized individual transport		7,49
	Local public transport		0,01
	Long-distance passenger transport		0,01
	Transport of goods		0,31
	Air traffic (interior)		0,01
Emissions of NOx		258	219,21
thereof:	Motorized individual transport		69,58
	Local public transport		8,69
	Long-distance passenger transport		6,34
	Transport of goods		132,30
	Air traffic (interior)		2,30

Preliminary results: national N-budgeting update

2007		
Commodities [Gg N/a]	Import	Export
Meat and meat products	69,66	97,09
Milk, dairy products and eggs	175,87	252,47
Fish and seafood	29,08	18,96
Grain and grainproducts	133,72	189,38
Vegetables and fruits	33,06	12,90
Coffee and tea	69,43	43,52
Wood (untreated, raw)	8,64	17,60
Coal and coke	599,92	34,31
sum	1119,39	666,24
difference	453,14	
	453,14 Gg Import	

Preliminary results: national N-budgeting update

<u>Industry & Household energy [GgN]</u>		2005-2007	2001-2004
	(Gg N/ a)		
Emissions of N2O		28,34	39
thereof:	Industry	15,1	
	Energy	8,06	
	Manufacturing business	1,74	
	small combustion plants household & business	1,02	
	product use	2,41	
Emissions of NH3		16,66	18
thereof:	Industry	9,48	
	Energy	2,52	
	Manufacturing business	0,94	
	small combustion plants household & business	2,30	
	product use	1,43	
Emissions of Nox		177,4	187
thereof:	Industry	28,03	
	Energy	87,68	
	Manufacturing business	20,84	
	small combustion plants household & business	40,86	
	product use	0	



Import (compare 2008 → 2010)

3200 → 3172 kt total

N-Fertilizer: 1808 → 1721 + 78 kt

Feed for domestic animals: 372 → 696 kt

Combustion processes: 514 → 451kt

Atmospheric Import: 260 → 226kt

Export

2000 → ~ ? kt total

Export Surfacewaters: 400 bis 500 → 565kt

Atmospheric Export: 687 → 536kt

Waste water management: ca. 300 → 311kt

Thank you for your attention!

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**Wirkungen von Luftverunreinigungen
auf terrestrische Ökosysteme**

