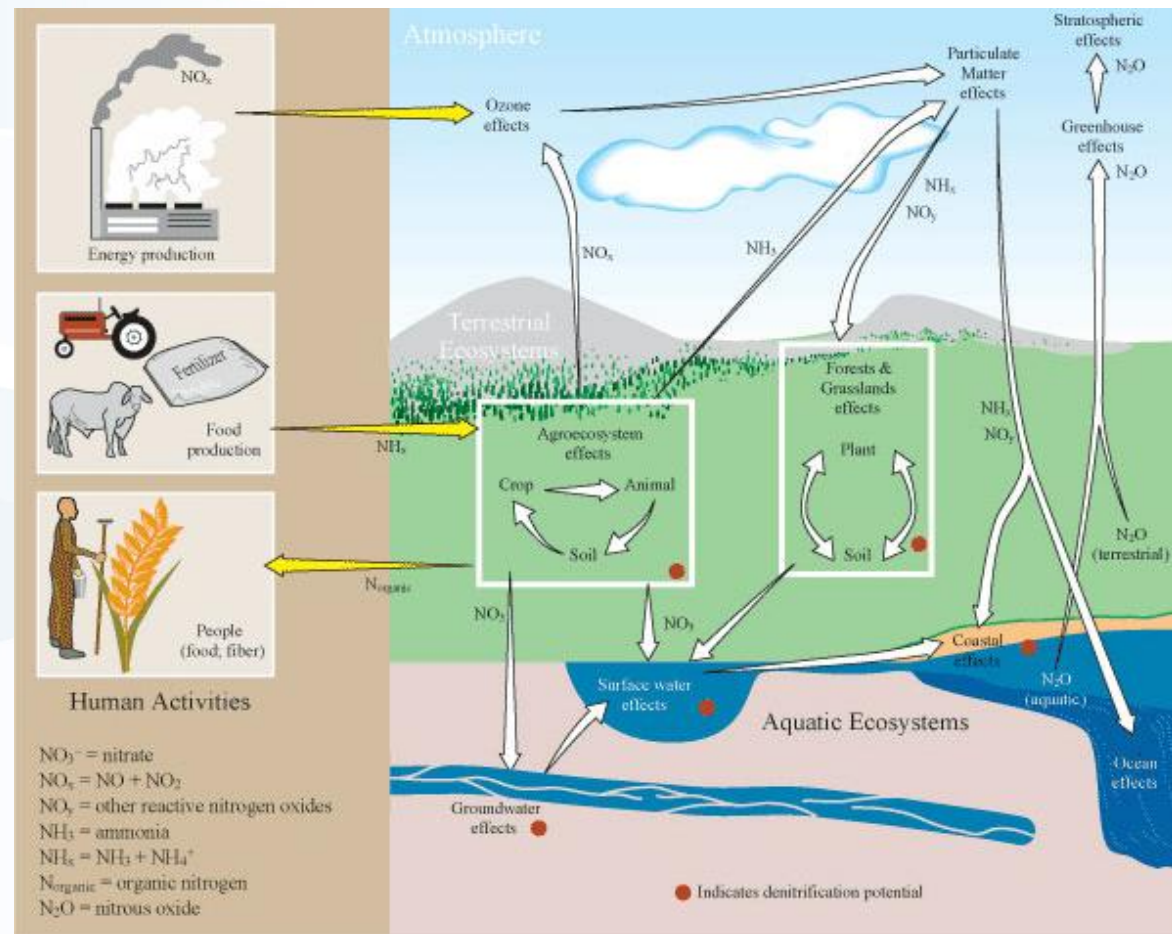


National Nitrogen Budgets: The methodology

Wilfried Winiwarter,
Albert Bleeker
representing the
Expert Panel on Nitrogen Budgets
(EPNB)

Conservation of matter as fundamental constraint

Reactive N
“cascading”
between
environmental
pools



Source: Galloway et al., 2003

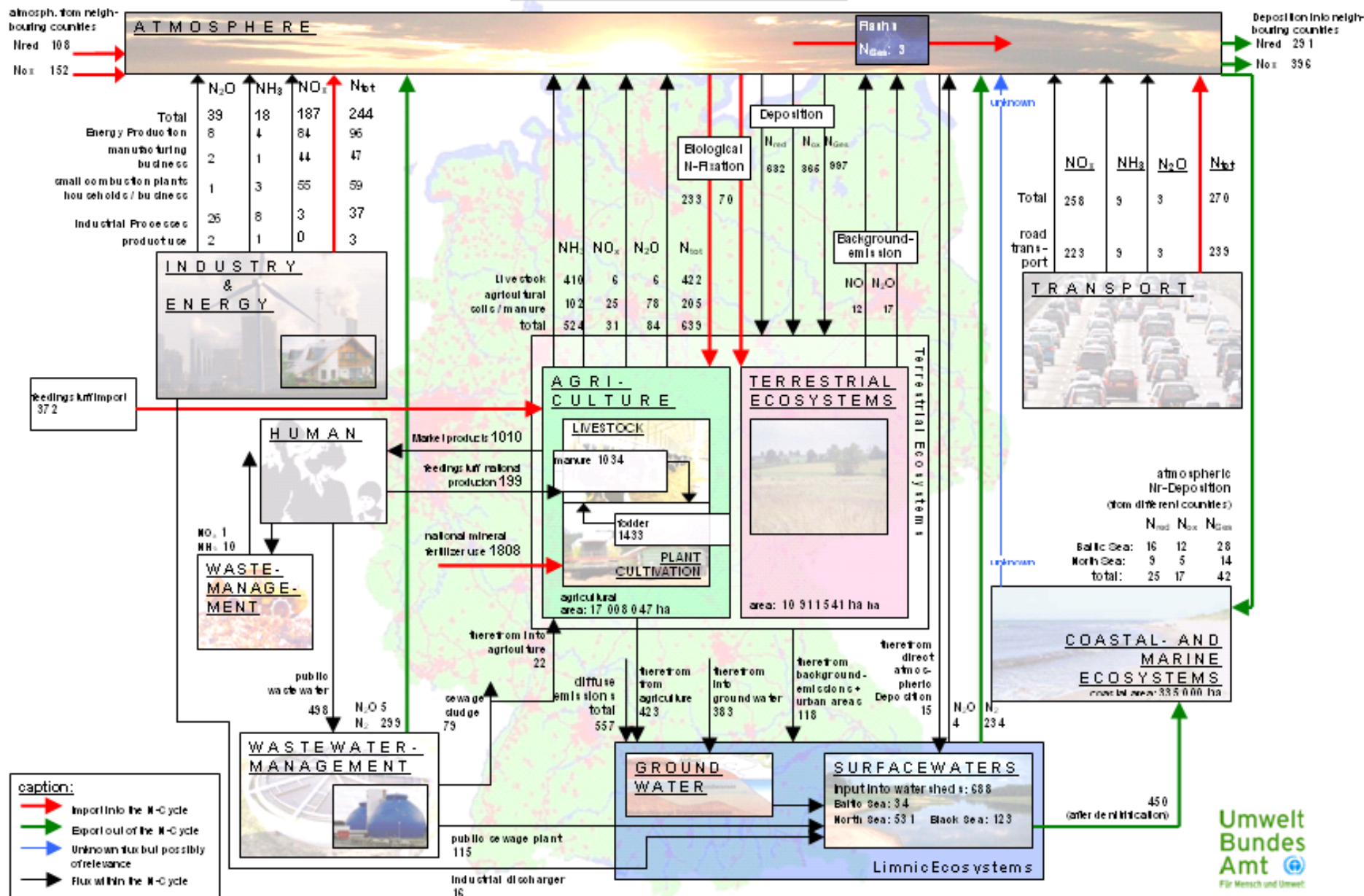
Nitrogen budgets

- Considerable information is available from different sources on nitrogen concentrations in pools and nitrogen flows.
- Need to avoid duplication of assessments
- Mass conservation considerations allow validation of system understanding in models.

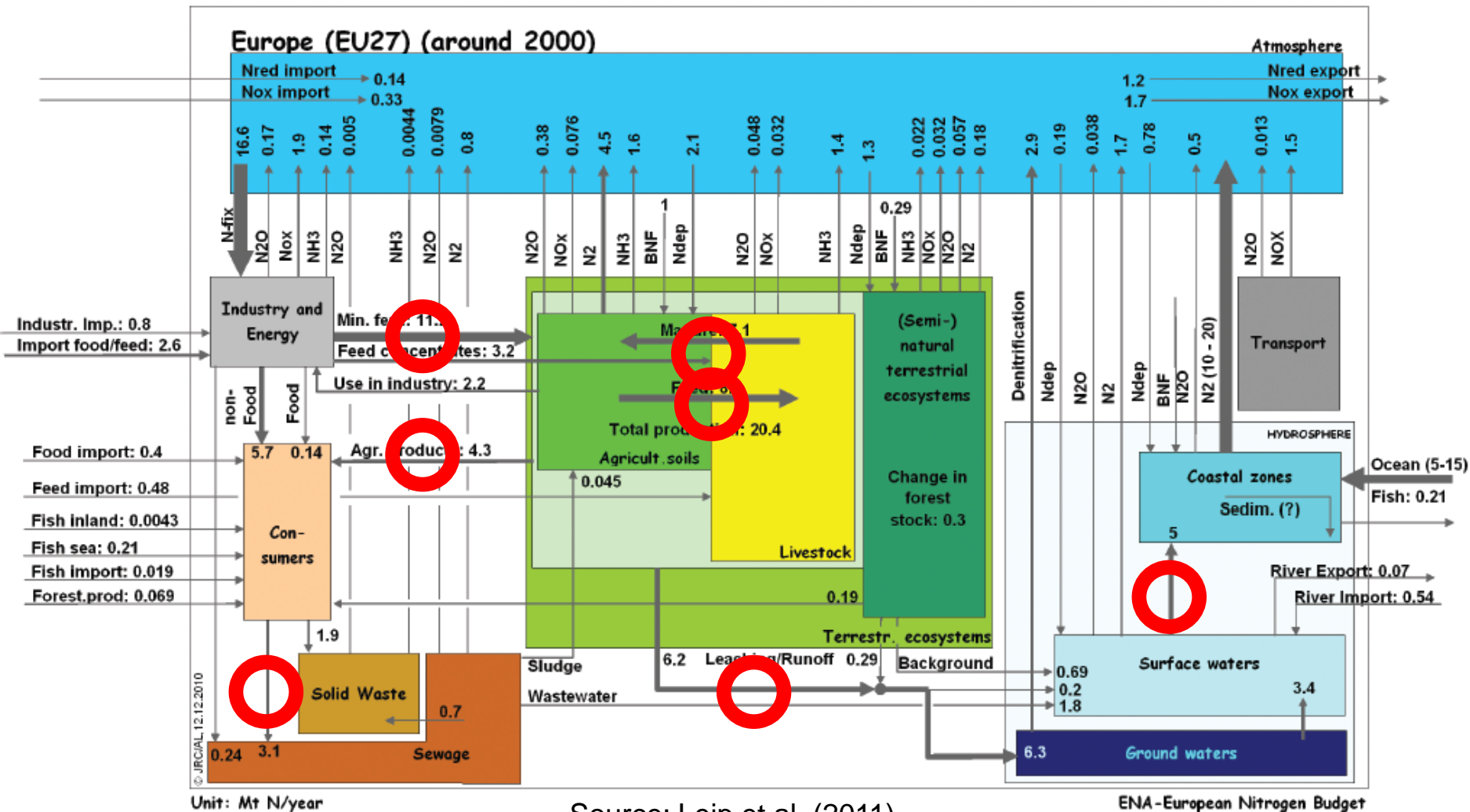
IMPORT

NITROGEN-FLUXES IN GERMANY

EXPORT



Europe (EU27) (around 2000)



Harmonization of activities

- UNECE – TFEIP, TFIAM
- UNFCCC emission inventories
- OECD “key environmental indicator”
- EUROSTAT Gross Nutrient Balances and Agro Environmental Indicators
- Memorandum of understanding between UN-ECE and Eurostat has been drafted

Guidance Document adopted

United Nations

ECE/EB.AIR/119



Economic and Social Council

Distr.: General
17 June 2013

Original: English

Economic Commission for Europe

Executive Body for the Convention on Long-range
Transboundary Air Pollution

Guidance document on national nitrogen budgets

Pools

For each pool, the following subsections should be considered:

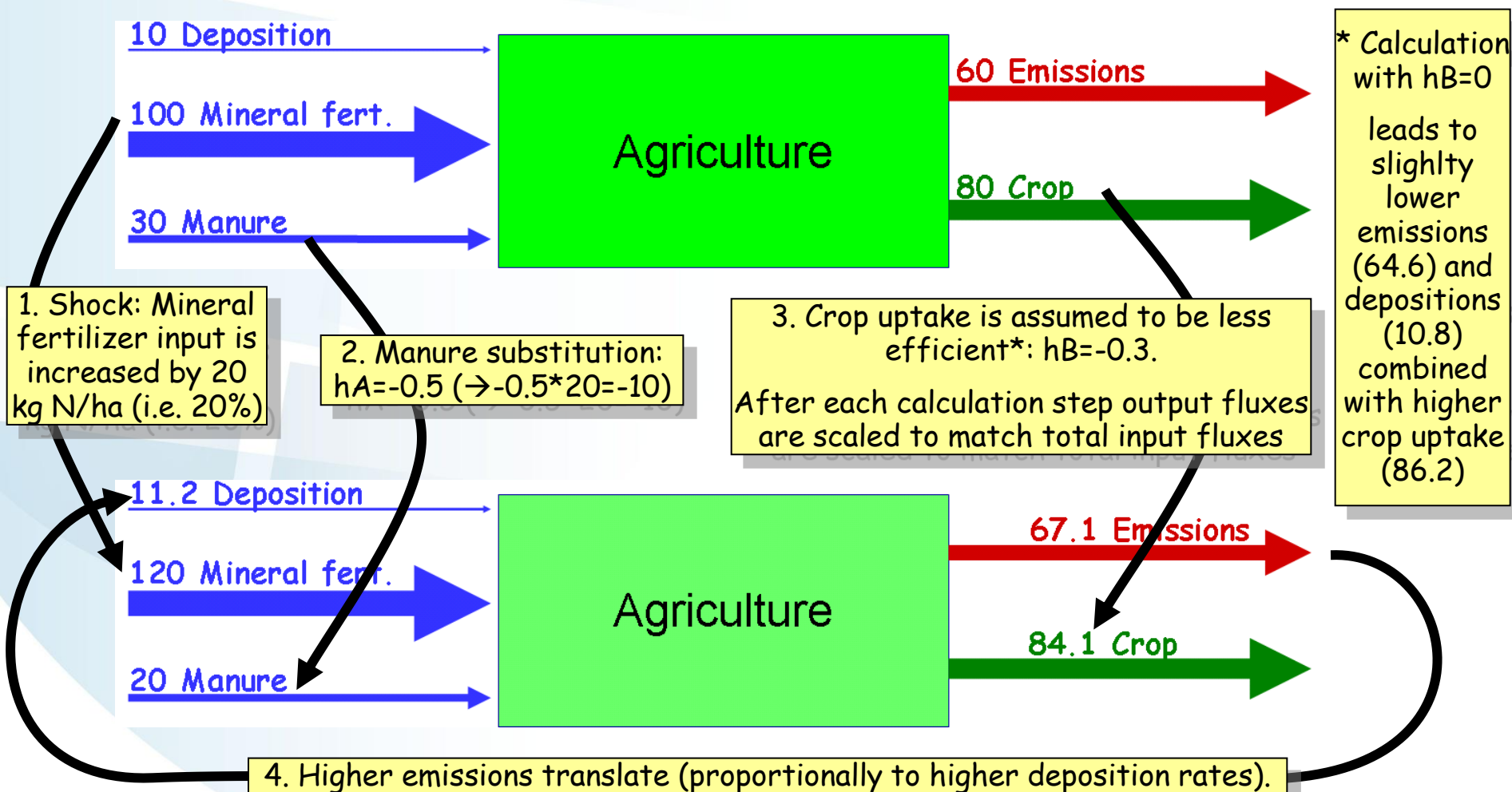
0 Atm
1 Ener
1A1
1A2
1A3
1A4
2 Mate
3 Cons
4 Agri
4B
4D/E
5 Vege
6 Was
7 Wate
7A
7B
7C

1. Introduction, main known features of the pool (compared to other pools)
2. Definition: detailed description of activities/fluxes encompassed by the pool; clear definition of boundaries, separate description for all potential nitrogen species involved
3. Internal structure: possible reference to sub-pools; “unlocking” (of other relevant fixed nitrogen) into Nr, if relevant; conversion of Nr species, if needed.
4. External structure: fluxes of Nr into and out of the pool; fluxes of N₂ formed or used when undergoing conversion (e.g., fixation or denitrification). The external structure must be defined in a way that the balance of the pool is conceptionally closed.
5. Underlying data: suggestions of data sources to be used (e.g., reference to other guidelines).
6. Factors and models: detailed descriptions of calculation algorithms for quantitative flux (and stock change) information, labeling of fluxes that are determined as residual from closing balance equations
7. Uncertainties, data quality issues and other items critically affecting results; indication of potentially missing fluxes
8. References, bibliography, further reading
9. Document version, author contact information

Still open

- Annexes to guidance document (description of individual pools)
- Update towards new reporting formats (UNFCCC, TFEIP)
- Extension to actually make use of the “conservation” concept: dynamic modelling

Dynamic modelling



Leip & Heldstab (2013)

Outlook

- Countries apply national budgets
- Improvement programs evaluate and mitigate nitrogen losses
- Nitrogen related environmental problems (quote Mark Sutton: WAGES) get resolved
- Minimized losses not only prevent damage, but reduce agricultural expenditure – at least partial win-win situations and overall cost savings occur