

Strategies for controlling nitrogen emissions from agriculture:

Regulatory, voluntary & economic approaches

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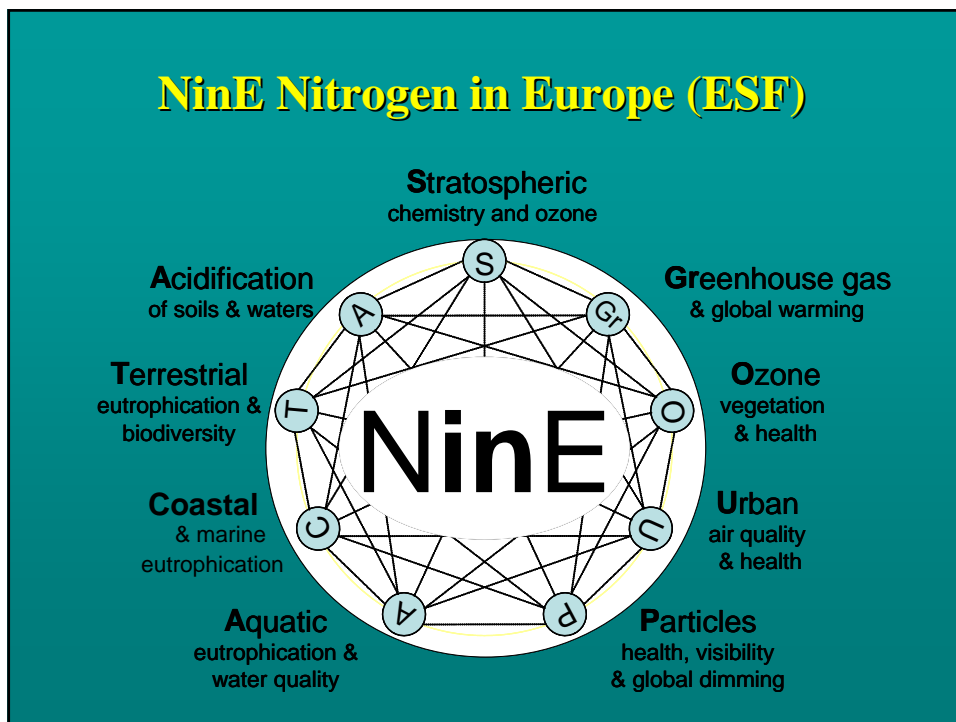
Activities

- **International Nitrogen Initiative (INI)**
 - project under SCOPE/IGBP, organizing N2007 Brazil
 - Focus to address linkages and strategies in global nitrogen cycle
 - European Centre
- **NitroEurope Integrated Project (NEU)**
 - EC Framework 6 project 2006-2010, 62 partners
 - Effect of N on the European GHG balance
- **COST 729: Nitrogen in biosphere atmosphere**
 - Link transboundary air pollution and GHG problems
- **Nitrogen in Europe (NinE)**
 - ESF framework programme
 - Assessing links between the 9 challenges of excess N
 - Will prepare European Nitrogen Assessment Report

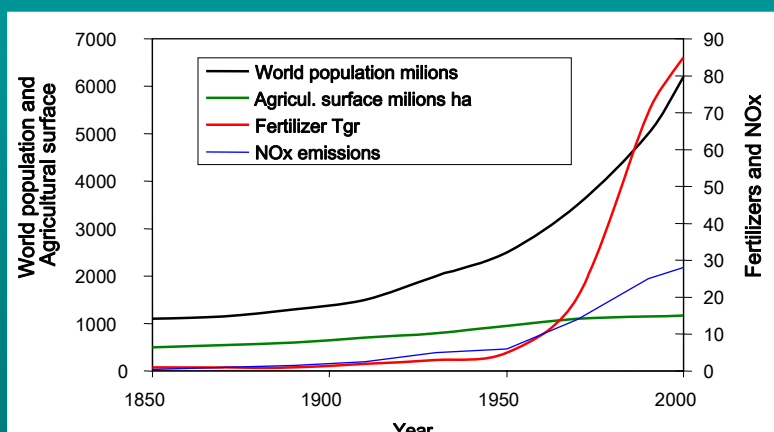
Access point: www.nitroeuropa.eu

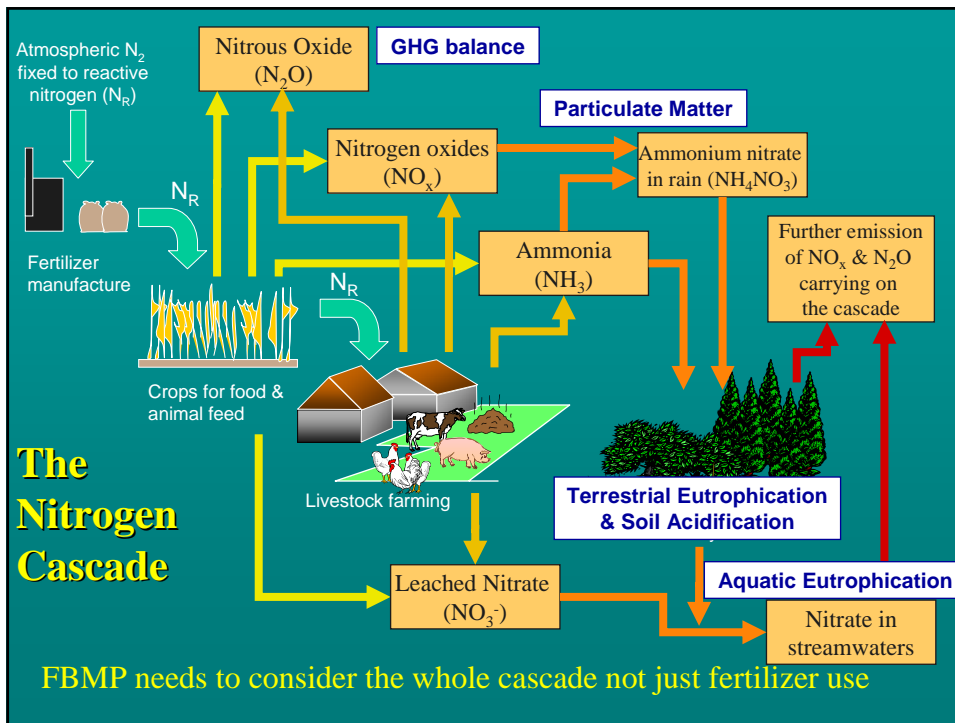


NinE Nitrogen in Europe (ESF)



Global increase in amounts of nitrogen

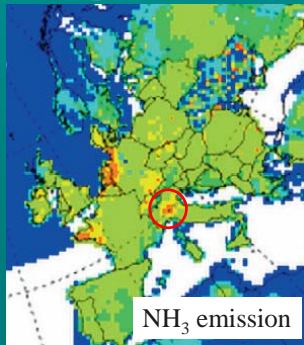






Ammonia contributes substantially to particulate matter (PM) concentrations

- Reduced visibility
- Human health impacts

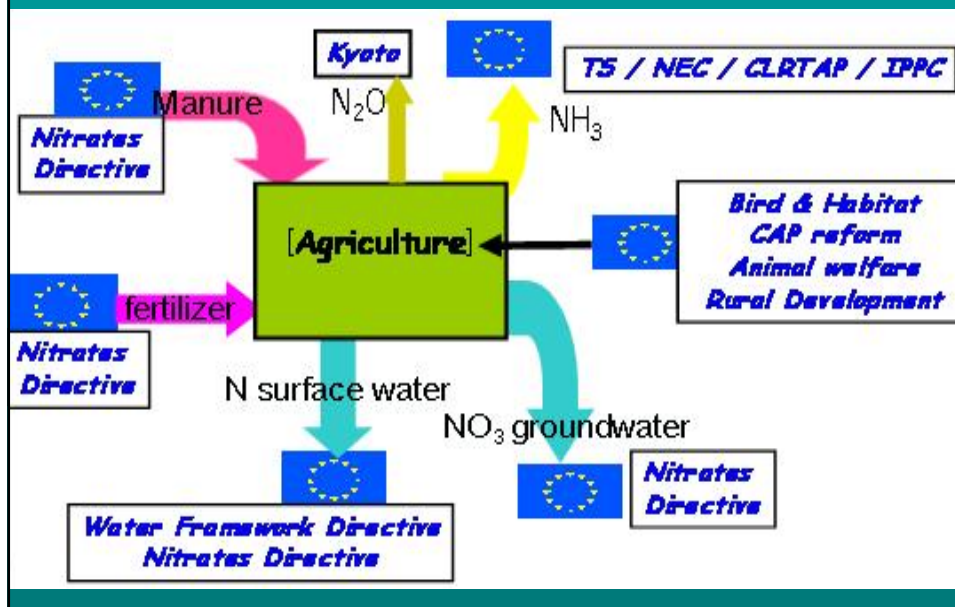


Parma, Emilia Romagna, Italy

Tool box of policy instruments

- **Economic instruments**
 - taxes & subsidies
 - price support
 - import/export tariffs
 - tradable rights and quotas
- **Communicative instruments**
 - agricultural extension service
 - education, demonstration and persuasion
 - co-operative approaches
- **Regulatory measures**
 - public land use planning (zoning/spatial planning)
 - pollution standards and national emissions
 - prohibition of particular agricultural production methods

Multiple EU policies affect nitrogen in agriculture

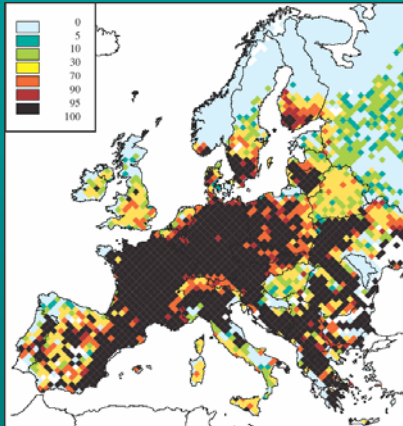


Transboundary Air Pollution from Agriculture

- UNECE Gothenburg Protocol and EC National Emissions Ceilings Directive
- Ammonia targets as national emissions for 2010, currently under review
- Effects-based, but not so high ambition
- Some countries got exemptions (e.g. Spain)
- Mandatory-voluntary COGAP to reduce NH_3 emissions
- Full ban on ammonium carbonate; debated ban on urea use - cheap measure on cost curves

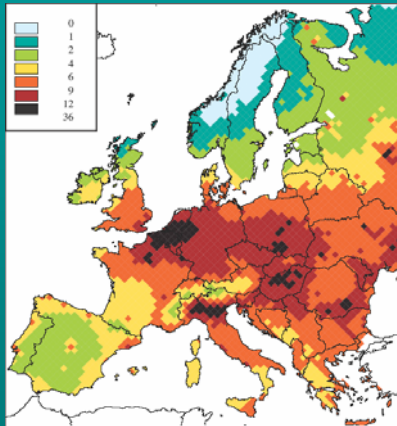
Predicted effects across Europe

Critical load exceedance
for N effects on ecosystems



% of ecosystems area with grid
average N deposition > eutrophication
critical loads (for 2000)

Loss in life expectancy
attributable to PM_{2.5}



Loss in average life expectancy
in months due to identified
anthropogenic PM_{2.5} (for 2000)



Lack of integration between regulations

- Ammonia abatement– some measures may increase nitrates emissions and nitrous oxide emissions (need to quantify)
- Nitrates abatement– some measures may increase ammonia emissions (e.g. winter closed period)
- Need for a more integrated approach. Targeted on balanced N supply, but other measures needed

Integrated Pollution Prevention and Control (IPPC) Directive

- Industrial approach to pollution control, using installation permits and Best Available Techniques (BAT)
- Pig farms above 2000 fatteners, 750 sows; poultry above 40,000 birds
- In principle integrated, (inc energy, noise etc), but most focus on NH₃
- BAT does not relate to specific emission targets
- Debate on inclusion of field spreading of manures!
- Link between IPPC and Habitats Directive and the loophole
- Not all N sources considered – possible unfairness
- Debate on extending IPPC to large cattle farms (e.g. >500 animals)

Benefits & challenges of regulatory approaches

- **Benefit**
- Can be clearly focused on specified environmental targets
- Clear basis for international agreements
- **Challenge**
- Develops a confrontational approach with industry, including governments in “policing role”
- Regulation overload for farmers...

Need to agree N_r pollutant priorities

- Where there are trade offs between pollutant control, which form of N_r loss should have the priority?

	General	Global	Transboundary	National	Local
Acidification from NH ₃	1	-	1	2	1
Eutrophication from NH ₃	1	-	2	1	1
NH ₄ ⁺ aerosol as a global coolant	-	1	-	-	-
Effect of NH ₃ on atmos. transport of SO _x & NO _y	-	2	2	3	-
Global warming from N ₂ O	1	1	-	-	-
NO ₃ ⁻ leaching	-	-	-	-	2

Results of DELPHI analysis by Angus et al. (J. Env. Man. 2003)

Voluntary Approaches

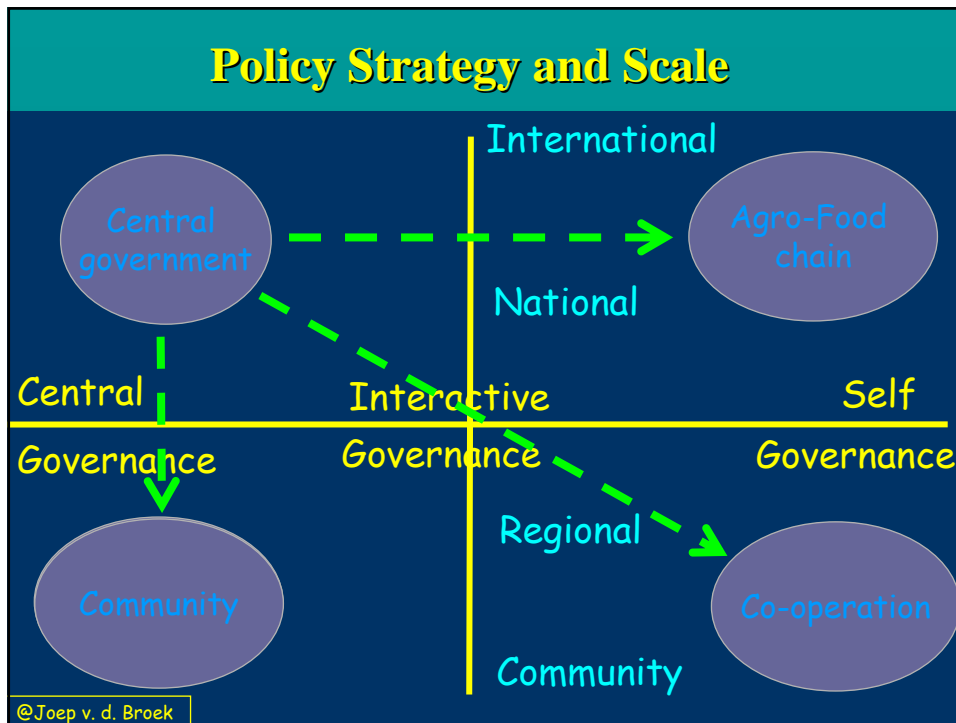
- **Government-led Codes of Good Agric Practice**
 - Sensible approaches, but question of how much is achieved
- **Industry-led initiatives**
 - FBMP – excellent contribution; to be encouraged
 - Stewardship and product labelling – encouraging public involvement
 - So far most labelling is animal and human health focused: challenge to raise the profile of N_r and environmental issues.

Need for greater use of economic incentives

- **Contradiction in agriculture:**
 - CAP support makes strong link to wildlife and countryside management
 - CAP currently weak link to better nutrient management and reducing N_r emissions
 - IPPC even has agriculture paying for pollution control: “polluter pays principle” applies.
- **Rural Development Programmes:**
 - Potential for incorporating N management issues
 - E.g. Austria, includes RDP funding for measures to reduce NH_3 emissions.

Finding the appropriate mix of instruments

- Overall Europe strongly regulation led. Provides clear focus, but confrontational and potential regulation overdose
- Governments need to encourage industry-led voluntary initiatives in partnership. Potential for innovative and optimised solutions.
- These should be supported by better integration of nutrient pollution issues into economic incentives of CAP and RDPs.



Question 1 to governments/society

- **What are the specific targets we agree on to reduce nitrogen emissions and impacts?**
- Agri-food chain can make improvements, but are these enough?
- Need to find consensus on quantified environmental targets and priorities between N forms and problems.
- Need to know whether voluntary achievement is a “drop in the ocean”, or the main way to meet targets.

Question 2 to governments/society

- **How can we adequately monitor the achievement of measures and environmental outcomes?**
- Difficulty to report achievement in the needed form is a central limitation to the adoption of more flexible voluntary approaches.
- Must be able to monitor contribution of measures to international conventions (e.g. GAP, FBMP in Gothenburg Protocol)
- Need to encourage regulators to focus more on international commitments that are measured in terms of environmental outcome.