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# **Development of European Nitrogen Policies**

**Nitro Europe Kick Off Meeting,  
Garmish Partenkirchen, 13 March 2006  
Michel SPONAR & Lars MUELLER & Liliana Cortellini,  
DG Environment**



# Outline



- 1. Why is it important to reduce nitrogen pressure?**
- 2. What are the main EU drivers influencing Nitrogen? And what are the expected developments?**
- 3. What are the main uncertainties and challenges when developing policies?**
- 4. Key expectations from the Nitro EU project**



## Why is it important to reduce nitrogen pressure?

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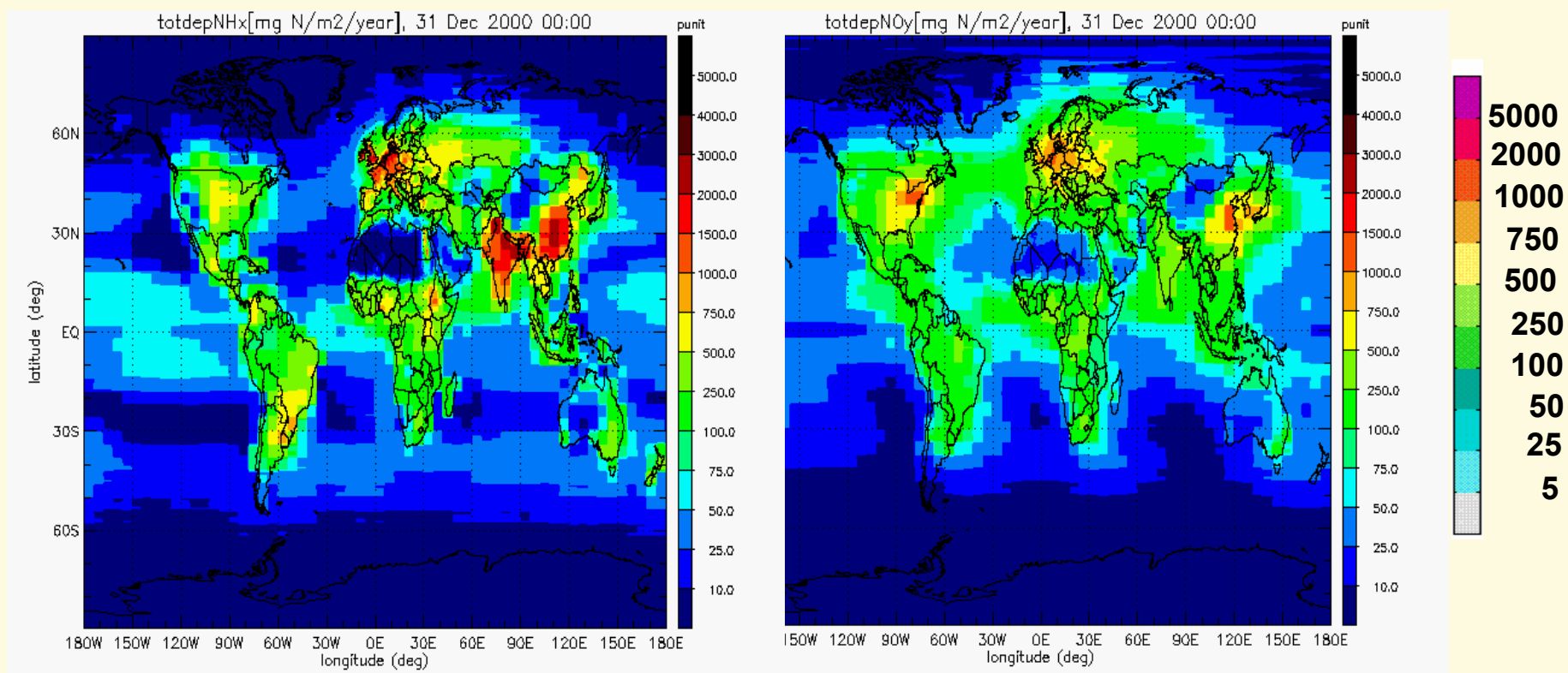


- Emissions in waters and air
- Impact on ecosystems, biodiversity and health
- Risk for the implementation of key European policies notably for what concerns climate change, air quality and emissions and water



# Atmospheric Deposition: *Past and Present*

mg N m<sup>-2</sup> yr<sup>-1</sup>



**NH<sub>x</sub>**

**NO<sub>y</sub>**

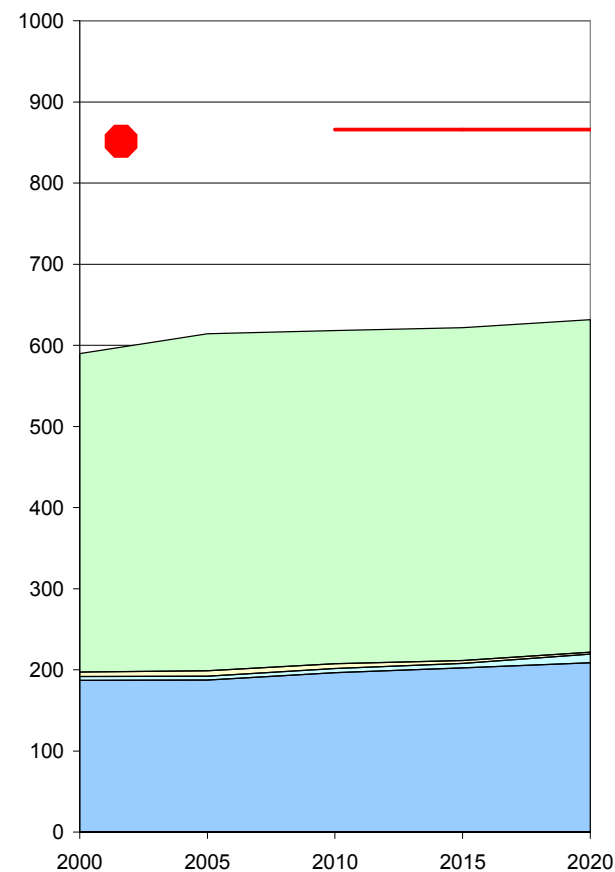
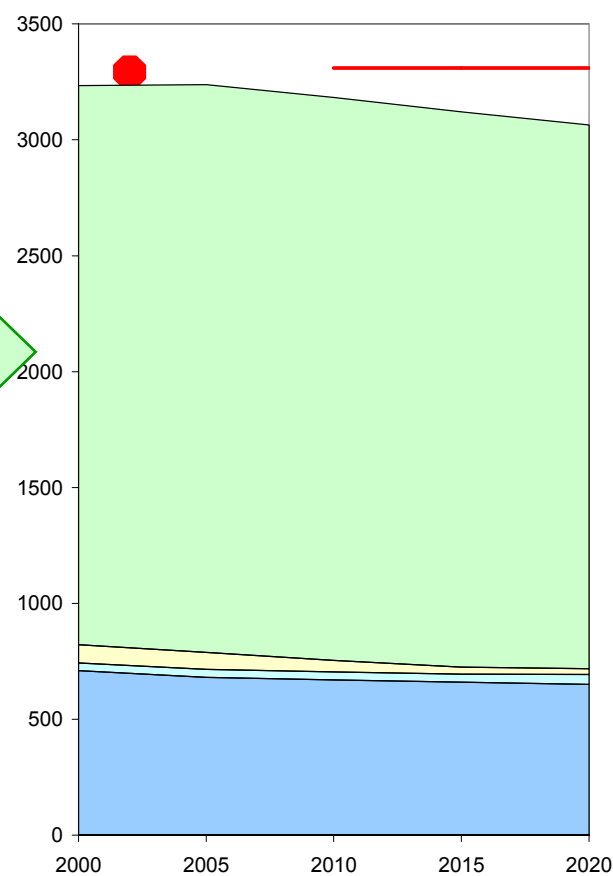
# NH<sub>3</sub> emissions

“Pre-CAP reform” scenario [kt]



Cattle:35%  
Pig/poultry:40%

EU-15

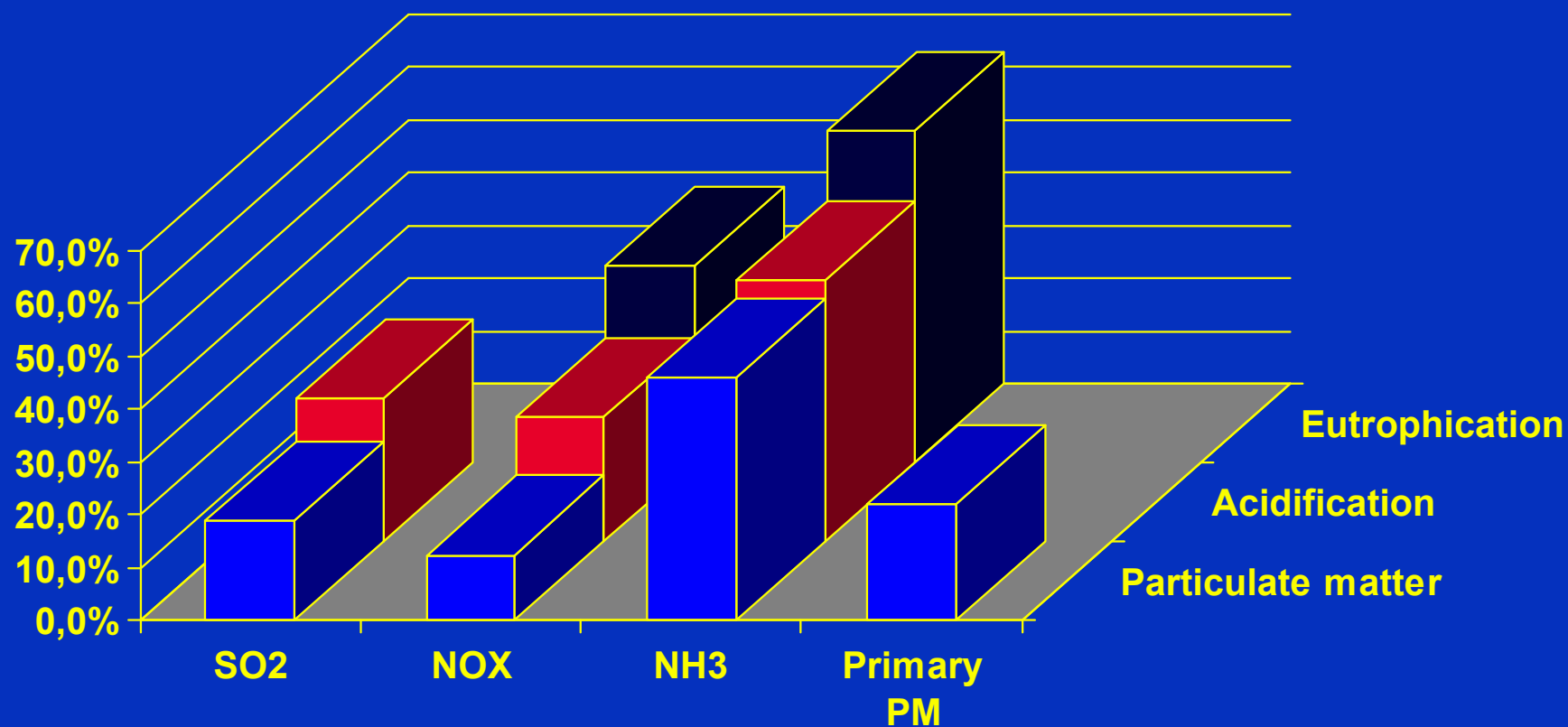


EU -  
10

■ Power generation ■ Industry ■ Domestic ■ Transport ■ Agriculture ■ N Mineral Fertilizer  
● NEC emission ceiling



## Fractional contribution of primary pollutants to the effects in 2020



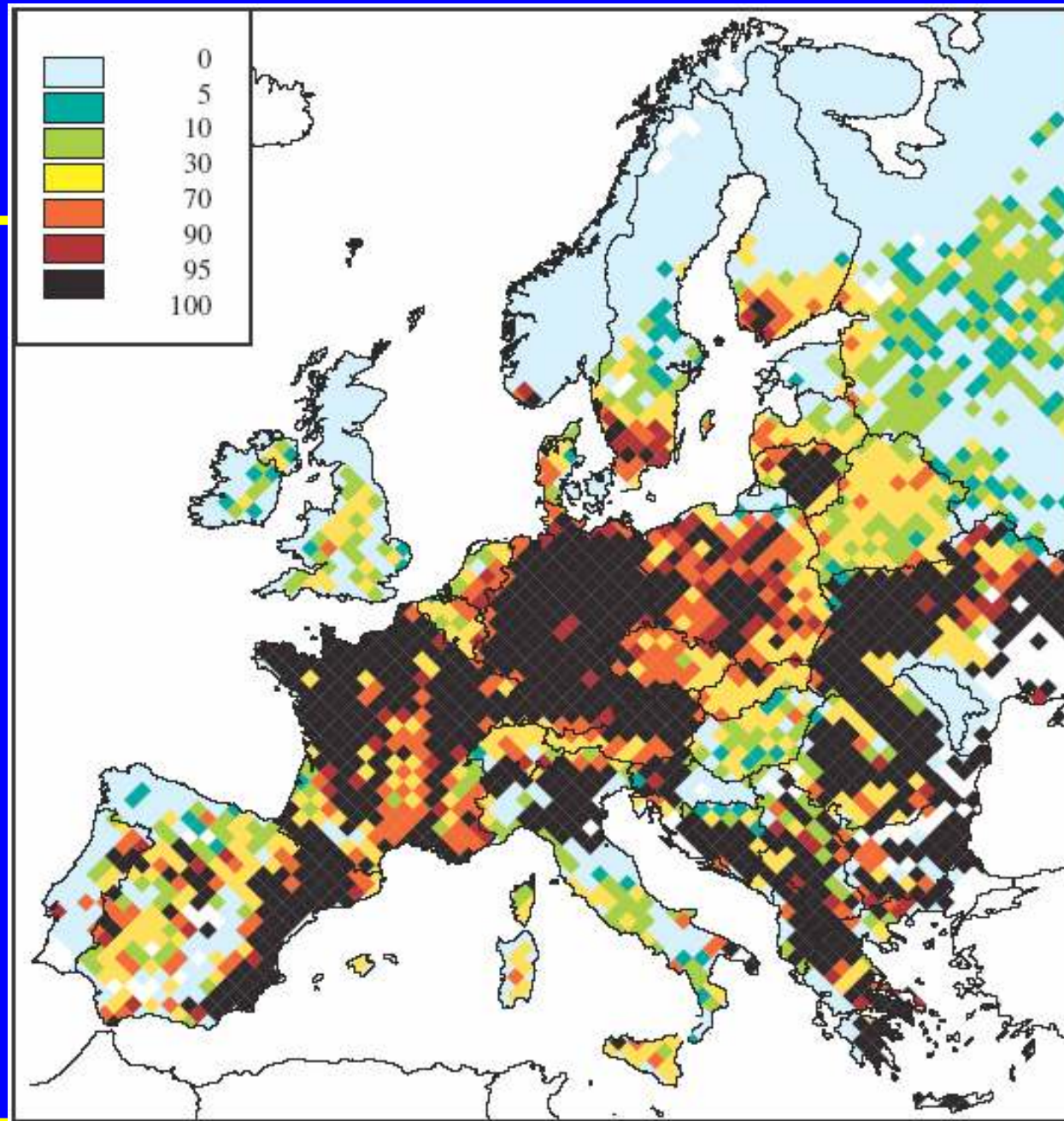


**Problem of too much  
nitrogen deposited to  
nature in 2020**

***No EU policies have yet  
addressed this***

**Ecosystem area  
exceeded eutrophication  
590 000 km<sup>2</sup>**

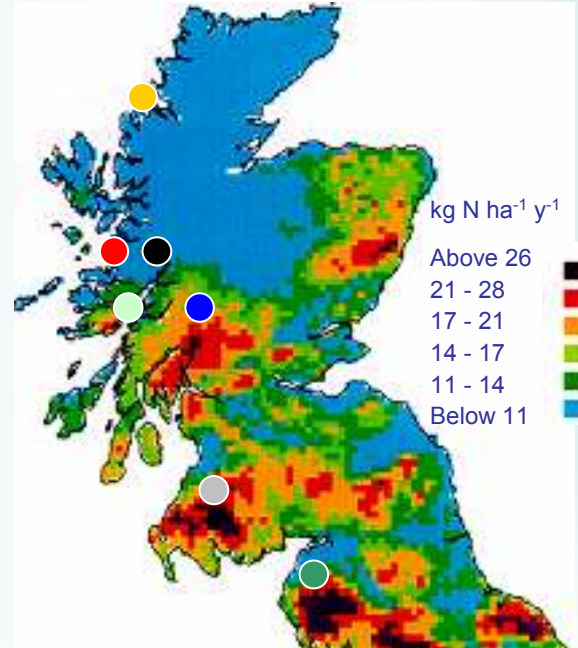
Percentage of  
ecosystems area with  
nitrogen deposition  
above critical loads  
using grid-average  
deposition.  
Calculation for 1997  
meteorology



Source: Clean Air for Europe Programme (2005)

## Low N

*Plagiochila atlantica*  
*Plagiochila spinulosa*  
*Frullania tamarisci*  
*Hypotrachyna laevigata*  
*Platismatia glauca*  
*Lobaria pulmonaria*  
*Lobaria amplissima*  
*Pertusaria hymeneae*  
*Melanelia fuliginosa*  
*subsp glabratula*



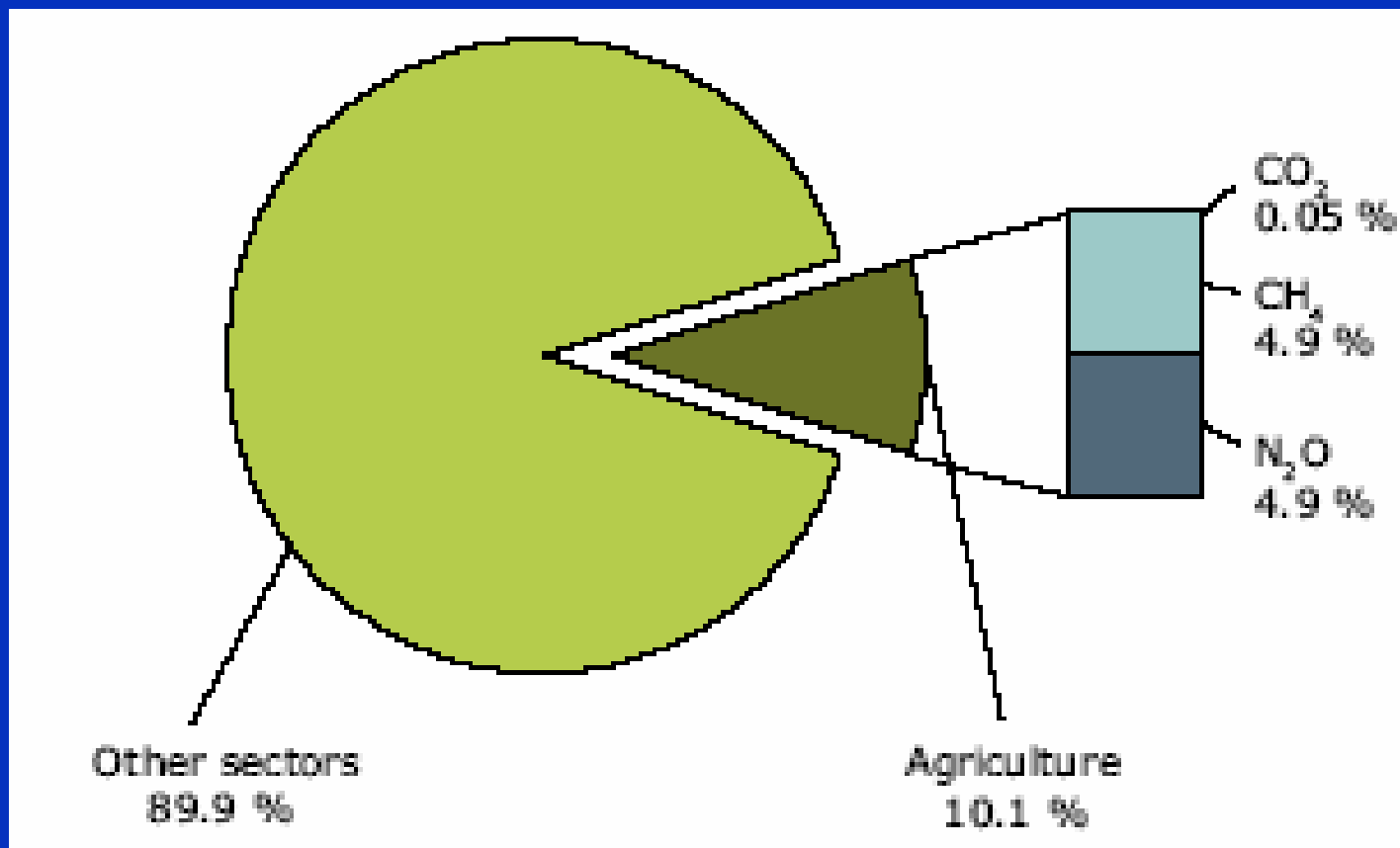
## High N

*Bryoria fuscescens*  
*Usnea subfloridana*  
*Hypnum cupressiforme*  
*Hypnum andoi*  
*Parmelia saxatilis*  
*Chrysothrix candelaris*  
*Hypogymnia physodes*





## Contribution of Agriculture to GHG's emissions (2002) – EEA

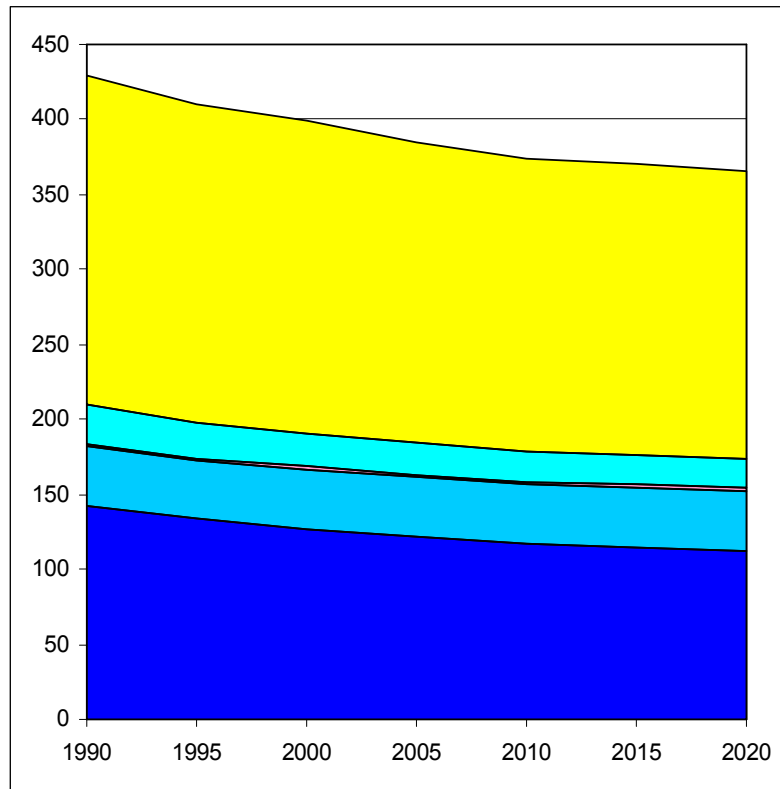


# GHG emissions; Scenario 2 (MTR)

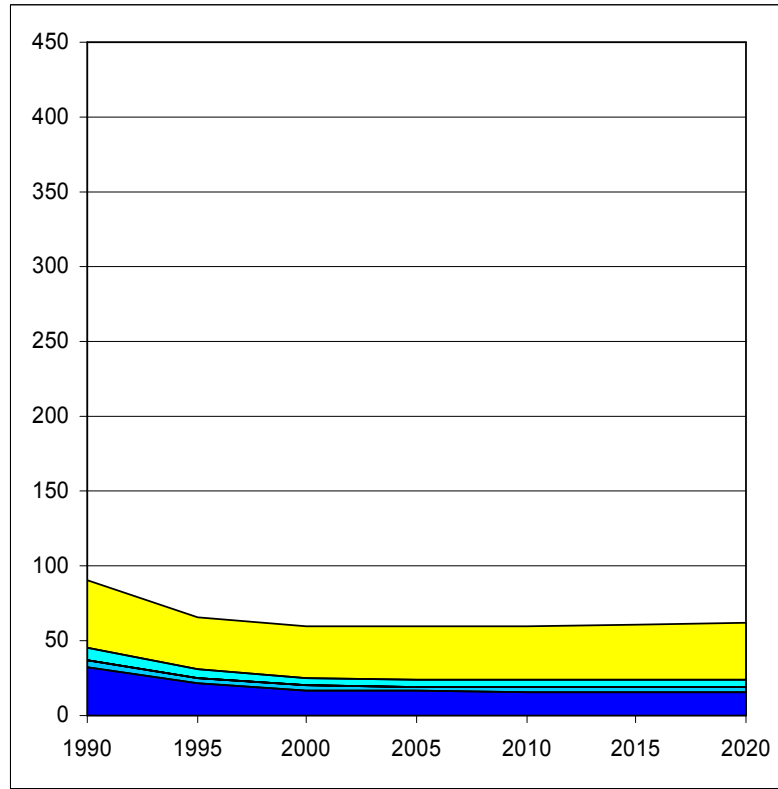
[Mt CO<sub>2</sub>eq.]



**EU-15**



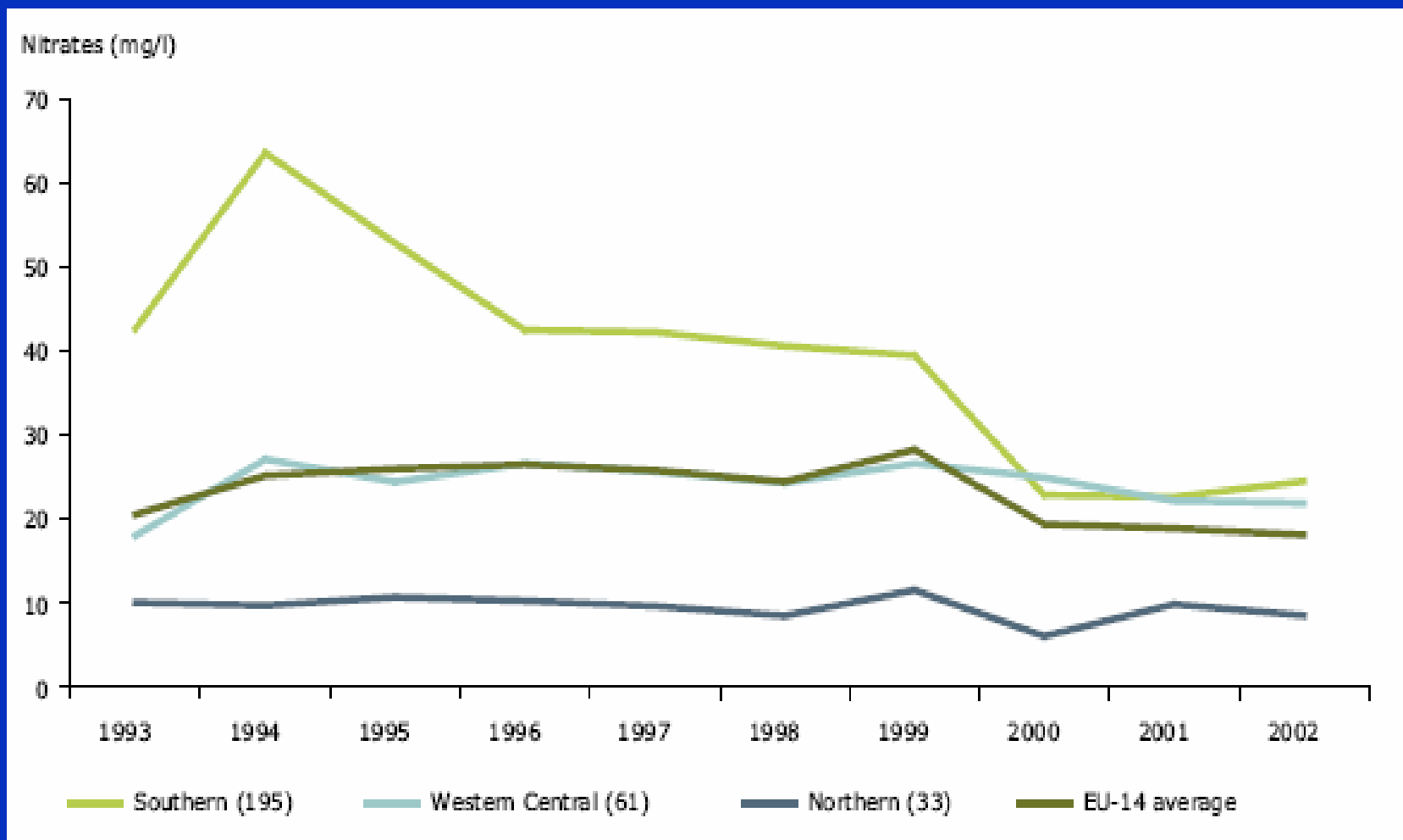
**NMS-10**



■ CH4 Enteric fermentation ■ CH4 Manure management ■ CH4 Rice cultivation  
■ N2O Manure management ■ N2O Soil



# Nitrate concentration in ground waters – EEA 2004 (mg/l)





## What are the main EU drivers?

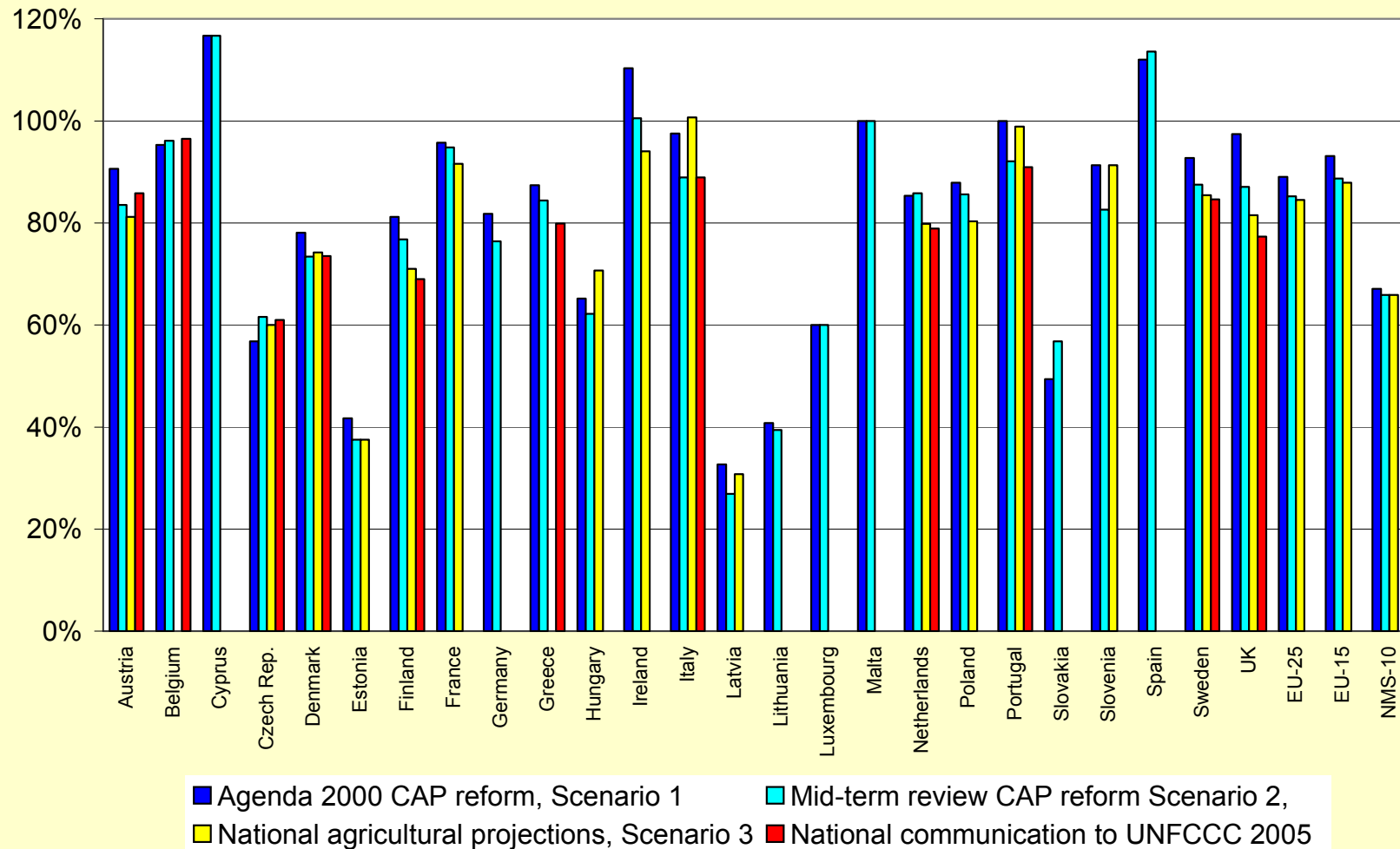


### Family 1: linked with common agricultural policies and energy

- **CAP Reform:** decoupling and cross compliance (payments not linked with production and linked with respect of main directives) - Full implementation as from 2007, reduction of cattle number, concentration in NMS
- **Rural development:** allows funding for additional efforts, priority on water and climate change (less on ammonia) - new rules for the 2007-2012 cycle
- **Liberalisation:** sugar reform, World Trade Organisation (Honk Kong conference) – delocalisation of some activities
- **New policies:** biofuel/mass, objective: from 1% to 4.75% biofuel by 2010 and from 4% to 8% of biomass use in 2010

# Projections of agricultural GHG emissions for 2010

(relative to 1990, using adjusted emission factors)





# What are the main drivers?



## Family 2: linked with environmental concerns

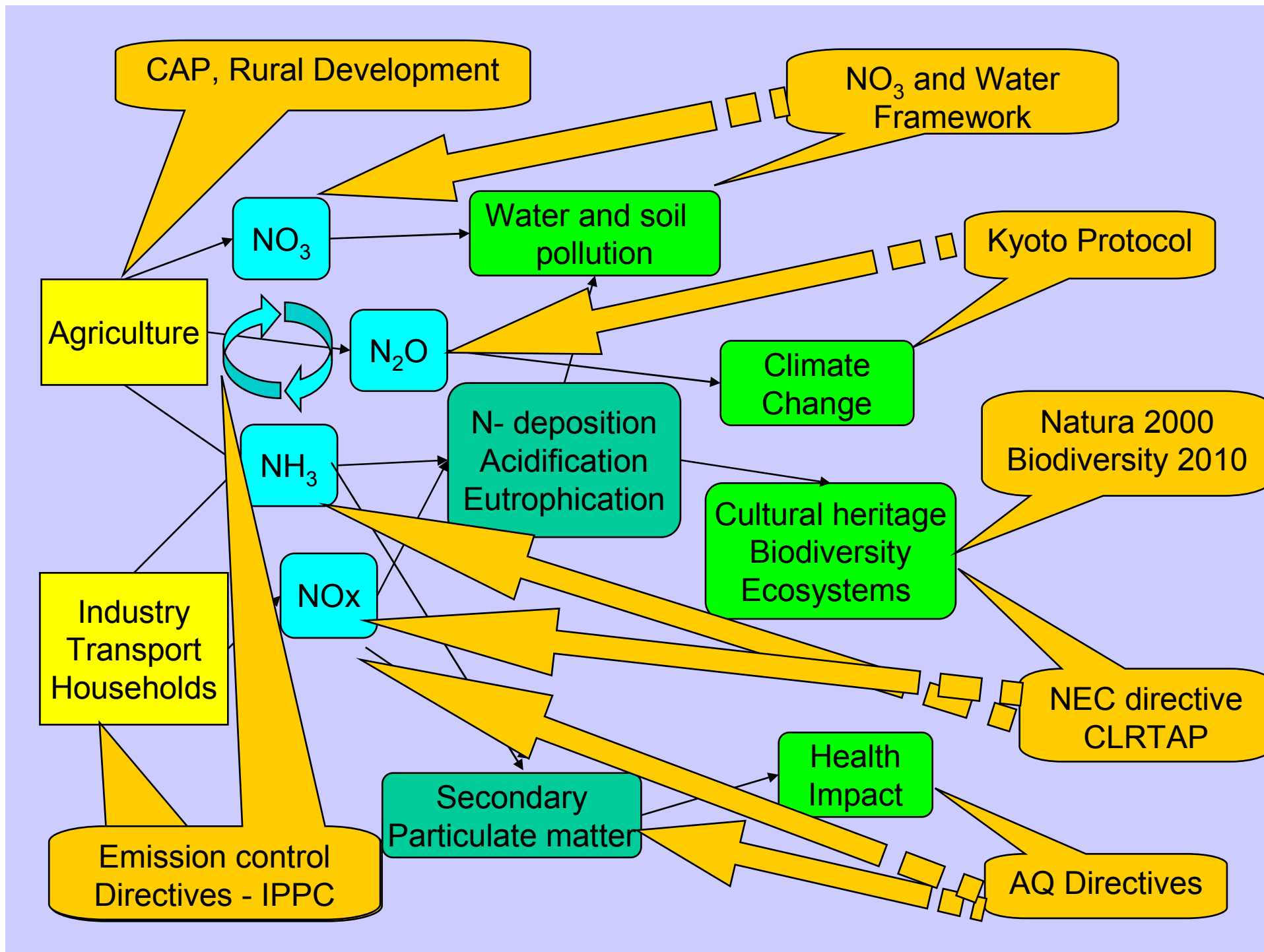
1. **Nitrate directive:** water monitoring, 50 mg/L NO<sub>3</sub> limit value in the waters and no eutrophication, vulnerable zones with action programmes (or action programmes implemented on the whole territory), code of good practises, 4 years review cycle
2. **Water Framework directive:** “Good ecological status of the waters” to be met in 2015 – new guideline for eutrophication, river basin management plans by 2009
3. **Habitat Directive:** management plans of protected areas to be done – Biodiversity objectives “Halting loss of biodiversity in 2010”



## What are the main drivers?



4. **Climate change: Post Kyoto (range of 15 to 30 % reduction by 2020), new allocation plans for emission trading mid 2006 – influence on CH<sub>4</sub>/N<sub>2</sub>O emissions, new communication in 2006 including recommendations for mitigation measures**
5. **Thematic strategy on air pollution: objective is to reduce ammonia emissions from 28% by 2020 – National Emission Ceiling Directive including Ammonia to be reviewed in 2007 – AQ limit values**
6. **IPPC Directive pigs and poultry installations – full implementation in 2007 – review in 2007 including possible new thresholds and inclusion of cattle farming**

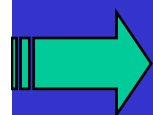




## Recent Developments



**“Absolute necessity of an integrated approach of the N-cycle and related instruments”**



**Identify/promote measures reducing N-Excess in Agriculture, ensure consistency between various instruments and policies**



# Recent Development



**2 studies (ALTERRA & Univ. of Bonn and Wageningen ,  
IIASA) Objectives:**

- **Assess impact of CAP reform, further liberalisation, biomass/biofuel plans,**
- **Assess impact of various set of measures on Nitrate, WFD, NEC and CC policies**
- **Analyse existing EU and International instruments**
- **Identify and assess the most promising measures**
- **Impact assessment of a possible extension of the IPPC directive**

**Deadline: March 2007, More information:**

**<http://europa.eu.int/comm/environment/air/cafe/index.htm>**



# Expectations from Nitro EU



**Main expectation: reduce uncertainties in order to contribute to define appropriate EU policies**

- 1. Inventories : GHG's, NH<sub>3</sub>, NO<sub>3</sub> (emission factors and activities) - N cycle closing – global and at farm level**
- 2. Improve knowledge on abatement technologies : cost, emission reduction, feasibility, animal welfare, impact on water/climate and air**
- 3. Better understand (cross) impacts on climate, water, health, ecosystems and biodiversity, air quality of N emissions**
- 4. Better understand dispersion pathway of various N sources: atmospheric modelling (differences between observations and models), recovery time for soils, )**



# Expectations from Nitro-EU



## Important for:

- **prioritize actions**
- **better assess various plans (NEC, NO<sub>3</sub>, WFD, CC) and EU/international policies**
- **clarify cross effects (e.g. biomass/fuel production, N abatement techniques)**
- **link key EU policies with indicators: e.g. “halting loss of biodiversity”, relative contribution to eutrophication of each sources**



# Expectations from Nitro-EU



## Some key points:

1. Links with policies/instruments
2. Integration of the whole N-cycle
3. Feasibility at farm level
4. Integrate existing work – INI, CLRTAP, ECCP, RAINS, JRC, EUROHarp, COST729, other EU studies



**More information:**

<http://europa.eu.int/comm/environment/air/cafe/index.htm>

**Thank You for your attention !!!**