



Nitrogen in various EU directives – the need for coherent modelling information

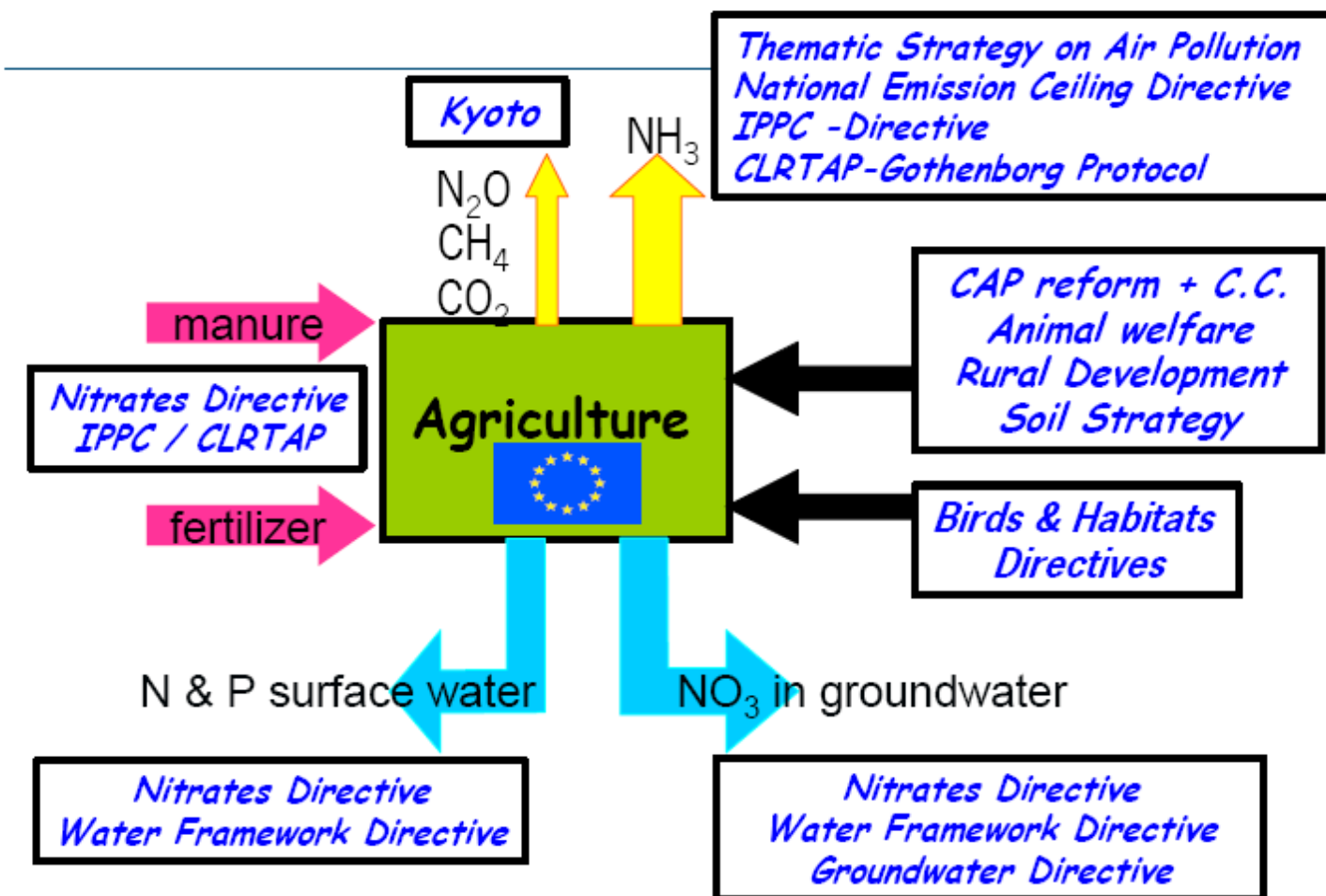
TFIAM/COST729/NinE
Workshop on integrated modelling of nitrogen

28 November 2007 - Laxenburg, Austria

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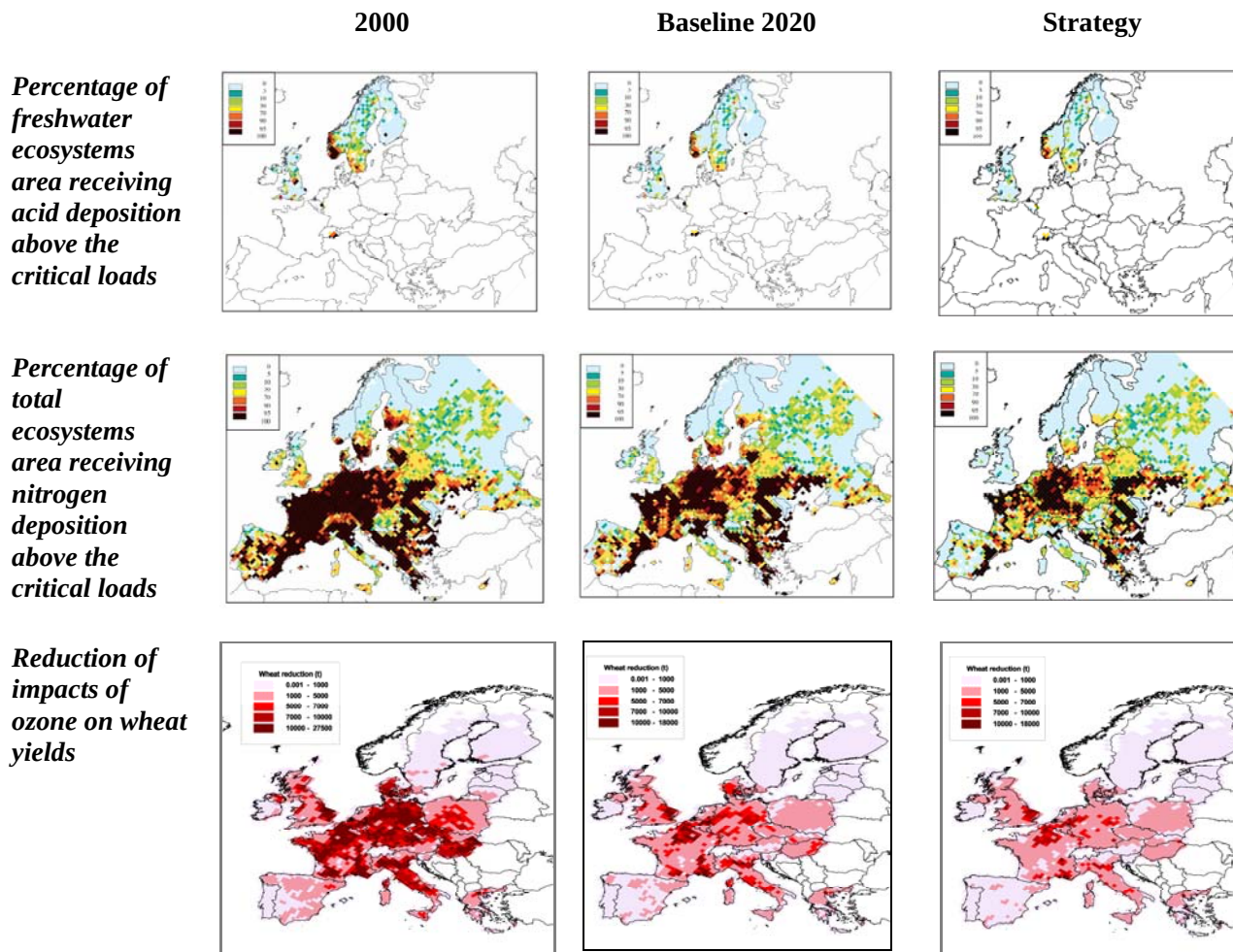


EU Policy instruments acting on the use and Multi-pollutant – multi-effect





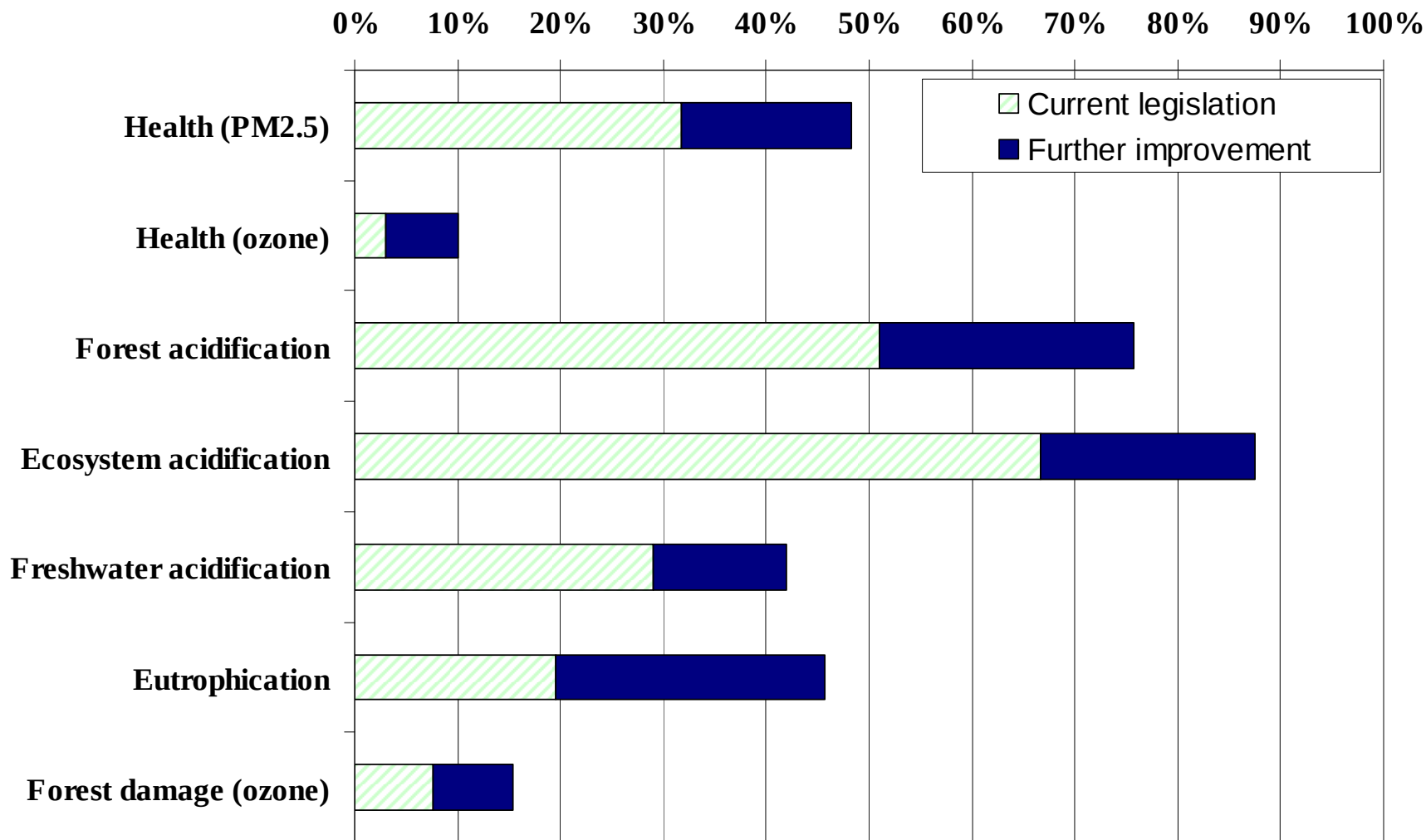
Environmental improvements by Thematic Strategy of Air Pollution



Source: RAINS. Note: Calculation results are based on meteorological conditions of 1997.



Improvement of health & environment indicators following the Strategy (improvement relative to 2000)





Thematic Strategy on Air Pollution

- The proposal for the revision of the NECD will respect the need for an integrated approach to nitrogen management
- Further improvements are also expected to result from an effective implementation of certain environmental Directives, such as the Nitrates Directive, the IPPC Directive, the Environmental Impact Assessment Directive and the Water Framework Directive.
- Priority will be attached to measures and policies to reduce “excessive” nitrogen use in agriculture and which simultaneously address nitrates in water, and ammonia and nitrous oxide emissions to air. Such policies could address (1) the nitrogen content of animal feedstuffs; (2) excessive use of nitrogen fertilisers; and (3) the promotion of further research into the nitrogen cycle and its environmental implications.



Service contract Alterra

Integrated measures in agriculture to reduce ammonia emissions

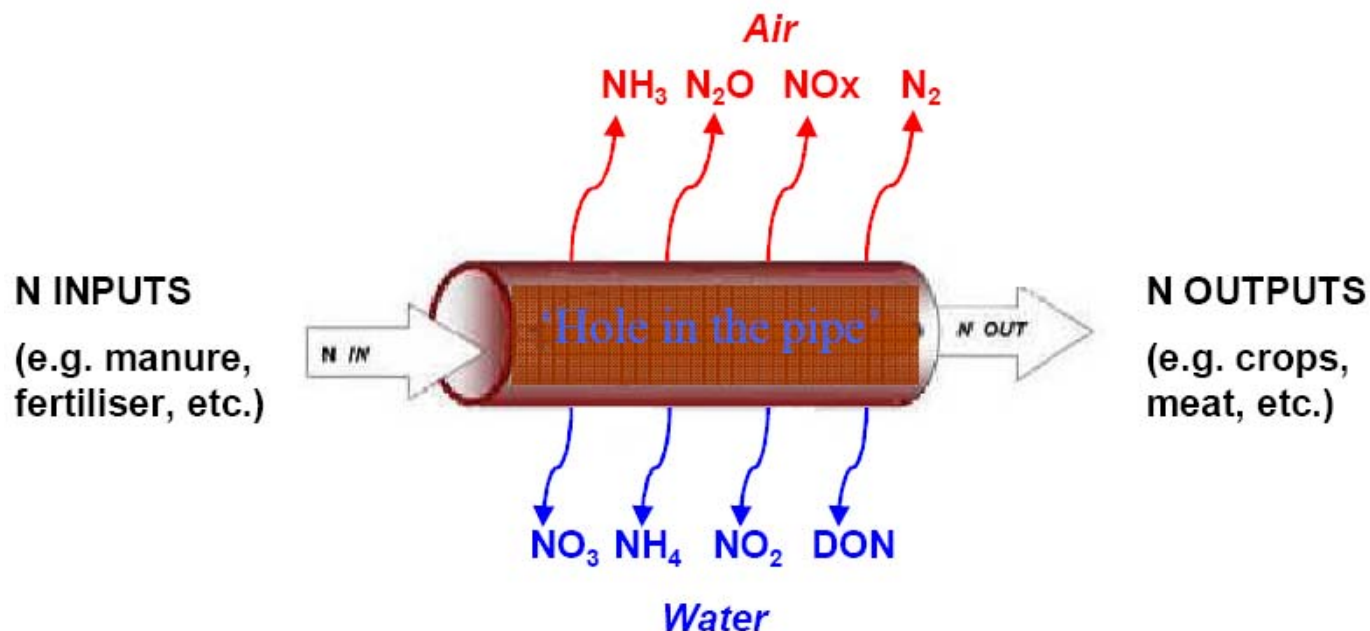
- Developing a simple integrated approach: MITERRA Europe
 - Analysis of international and European policy instruments: pollution swapping
- In depth assessment of most promising measures
- Impact assessment of possible modification of IPPC
(Likely result:
- Stakeholder consultations



‘Hole of the pipe’ model

Need to identify pollution swapping to:

- other pollutants - generally seen as a response to policies and measures that focus on one N loss form
- other areas – mostly by the transfer of manure





Possible pollution swapping by BAT-measures

BAT Measures	Gaseous emission to the atmosphere					Leaching
	NH ₃	N ₂ O-d	N ₂ O-i	CH ₄	NO _x	N
1. Low Nitrogen Fodder (dietary changes)	–	–	–	~	–	–
2. Stable Adaptation by improved design and construction of the floor	–	+	–/+	~	+	+
3. Covered Manure Storage	–	+	–/+	~	+	+
4. Biofiltration (air purification)	–	–	–	~	–	–
5. Low Ammonia Application of Manure	–	+	–/+	~	+	+
6. Substitution of urea with ammonium nitrate	–	+	–/+	~	+	+
7. Incineration of poultry manure	–	–	–	~	–	–
8. Nitrogen management; balancing manure nutrients with other fertilizers to crop requirements	–	–	–	~	–	–



Sensitivity analysis for the Nitrate Directive

- Full implementation of the Nitrate Directive (ND) will cause changes in agricultural activity levels
- Scenario on the impacts of the Nitrate Directive developed in collaboration with Alterra (MITERRA model)
- Principal assumptions:
 - Full compliance with the ND by 2020 within country-specific designated NVZ
 - Based on the national projections of the EU-27 countries
 - Reduced use of mineral fertilizers
 - Increased penetration of low protein feed and treatment of manure
 - Reduction of livestock density in some countries.
- Results are still illustrative, more work would be required



Sensitivity analysis for the Nitrate Directive (2)

In 2020:

- **NH₃ baseline emissions lower by 304 kt NH₃ (-8.4%)**
- **Baseline costs increase by about 873 million € (+25%)**
 - 163 million € for technical measures
 - 710 million € for balanced fertilization costs estimated by Alterra (CAPRI model)
 - Costs of revenue loss due to reduction in livestock not included



Sensitivity analysis for the Nitrate Directive (4) - Conclusions

- Implementation of Nitrate Directive should form part of “current legislation” NEC baseline, but difficult to quantify.
- Implementation of the Nitrate Directive increases baseline costs by 0.9 bn €, but decreases additional control costs for achieving the TSAP targets by 1.2 bn € (essentially for agriculture).
- With overall cost savings of 0.3 bn €, the Nitrate Directive (as modelled in this study) is already cost-effective for NH₃ emissions alone.



Future N-policy

- Discussion about the implications of the ALTERRA study for DG ENV policies not finalized yet, however:
 - future development and revision of existing policies particularly, in particular the nitrates directive and the associated issue of nitrogen management at farm level, should benefit from the study;
 - N-interactions between policies in different fields (agriculture, climate change, air pollution, biodiversity,), have to be assessed to the extent possible;
 - for which specific appropriate modelling tools, like MITERRA, are needed; being part of network of well established modelling tools for a comprehensive integrated assessment of the policy effectiveness of emission control strategies for pollutants (EC4MACS);
 - results will be laid down in Impact Assessments accompanying legislative proposals.



Future N-policy

- **European Commission supports the inclusion of the N-cycle in the scope of the revision of the Gothenburg protocol and is highly interested in the approach chosen and the possible result.**



DG ENV website

Environment on Europe



http://ec.europa.eu/environment/air/index_en.htm

