Different title than in the agenda

Estimation of costs for implementing options from the GAINS model as identified in EPMAN-3, including statement of uncertainties, co-benefits and factors included/not yet included.
Status of data in GAINS

- Basic data as used for the CAFE process (pretty old, for NH3 related technology principally based on the 1999 guidance)

- The update planned before scenarios for UNECE (February 2010) and shall include the information included in the current background document.
Categories of emission control options in GAINS for agriculture

- Low nitrogen feed
- Low emission housing
- Air purification
- Covered storage \((\text{low and high efficiency})\)
- Low ammonia application \((\text{low and high efficiency})\)
- Urea substitution
- Incineration of poultry manures

- Combinations of the above options

- + options to control non-CO\(_2\) GHG (CH\(_4\), N\(_2\)O)
The expenditures on emissions control are differentiated in GAINS into:

- **Investments**
- **Fixed operating costs,**
  *i.e., costs of maintenance, insurance, administrative overhead*
- **Variable operating costs,**
  *e.g., increase in feed or fertilizer price, additional energy, water and labour use, costs of waste disposal, etc.*
Examples; National vs. GAINS costs

- Manure application
- Covered stores
Examples of costs for manure incorporation

Costs for slurry injection and incorporation of slurry and manures

Application rate (m$^3$/ha)

UK data - injection
UK data - incorporation
RAINS - injection
RAINS - incorporation

Germany

UK
Comparison of costs for storage covers for UK

**Costs of rigid covers on slurry tanks**

- **UK data - rigid covers**
- **Covers - pig slurry (RAINS)**
- **Covers - cattle slurry (RAINS)**
- **UK data - rigid covers - cattle slurry**
Examples of investment functions
*(storage of cattle manure)*

![Graph showing investment functions for Poland and the UK.](image-url)
Biggest problems

- Current structure and its evolution
- Current penetration of measures
- Constraints in application (applicability) of specific measures
- Consideration of some pollutant/media interactions

- More difficult to develop parameterization for Southern and Eastern Europe
EXAMPLE

- Potential impacts of considering implications of non-NH3 legislation on European costs of reducing NH3 emissions; the latter driven by ecosystem and PM health targets
Nitrate Directive (NEC-ND) scenario

Compared to the National baseline (NEC)

- 2020-CLE emissions lower by:
  - 304 kt NH$_3$,
  - 92 kt N$_2$O

- 2020-CLE costs are higher by about 873 million €
  - 163 million € - technical measures
  - 710 million € - balanced fertilization costs estimated by Alterra (CAPRI model)
  - Costs of revenue loss due to reduction in livestock not included (preliminary estimates range from 1.5-2 bln €)
Expected impact of full implementation of the Nitrate Directive
CLE – Current legislation, TSAP – EU Thematic Strategy

Emissions from agriculture

Total costs in agriculture

CLE-2020 TSAP

Baseline
Baseline + ND