

Data on nitrogen: required and available

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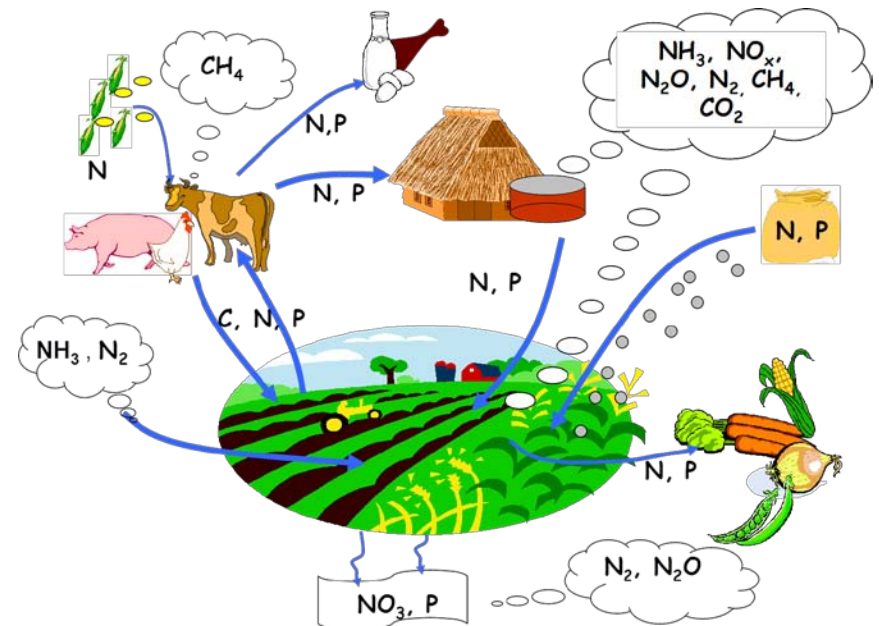
■ Agriculture

- Data needed for nutrient management on farms
- Developments

■ Environment

- Nitrogen related policies
- Monitoring

■ Conclusions



Data on farm scale

■ N inputs

- N in feed, fertilizer, manures
- Availability of N in fertilizer and manures

■ N outputs

- N in animal and crop products
- Yields and N contents



■ N cycling and losses in farming systems

- Losses: gaseous losses (ammonia, denitrification and leaching/surface runoff)
- Mineralisation in soils

Developments i): chemical analyses

- New and rapid methods to analyse soil samples
 - Near-infrared (NIR) spectroscopy
 - Simultaneous and rapid analysis of nutrients and soil properties in one soil sample
 - Fertilizer recommendations can be based on interactions between nutrients and soil properties



ii) Precision fertilization techniques

- 3S technology rapidly evolving: GIS, RS and GPS
 - Geographical Information System (GIS)
 - Remote sensing (RS)
 - Global Positioning System (GPS)

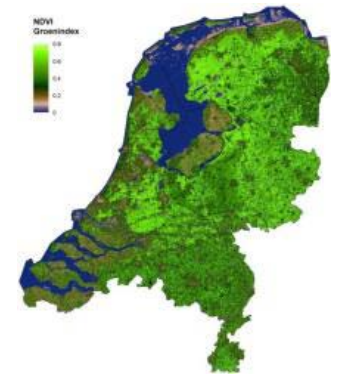
- Use of rapid soil and crop tests
- Use with weather data and projections
- Crop growth models

- Development of internet based Decision Support Systems: dynamic fertilization strategies

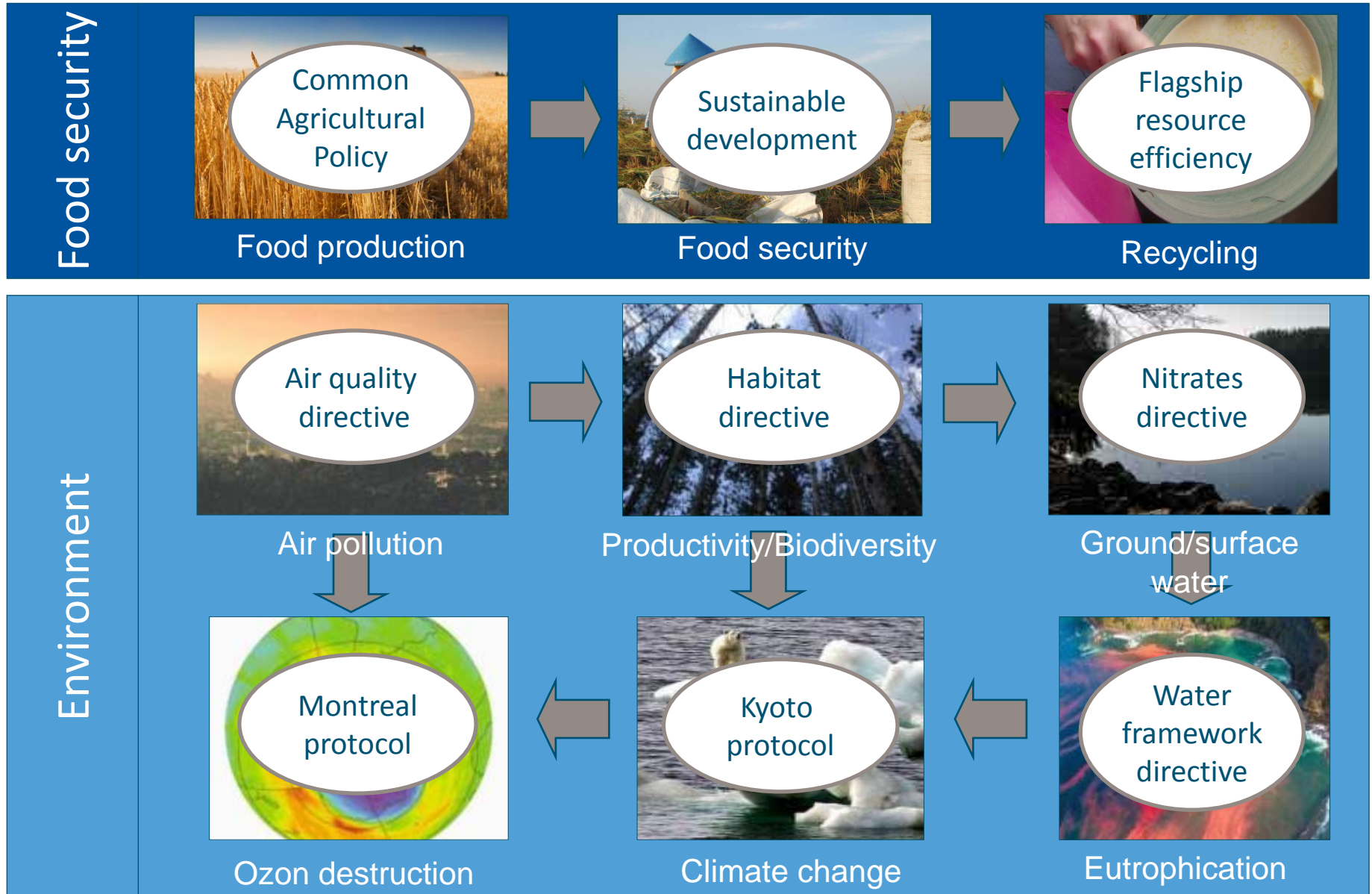


But

- Challenge: how to use these data to derive fertilizer recommendations for farmers
- Need of development of models and calculation methods
 - calibration/validation in field and pot experiments



N impacts are related to many EU policies



Data needs for monitoring of policies

1. Monitoring of calculated N emissions and N balances

- Guidebooks with methodologies available
 - Ammonia: EEA/EMEP guidebook
 - Nitrous oxide: IPCC guidelines
 - N balance: Eurostat/OECD Handbook

2. Monitoring of measured N concentration in water and air



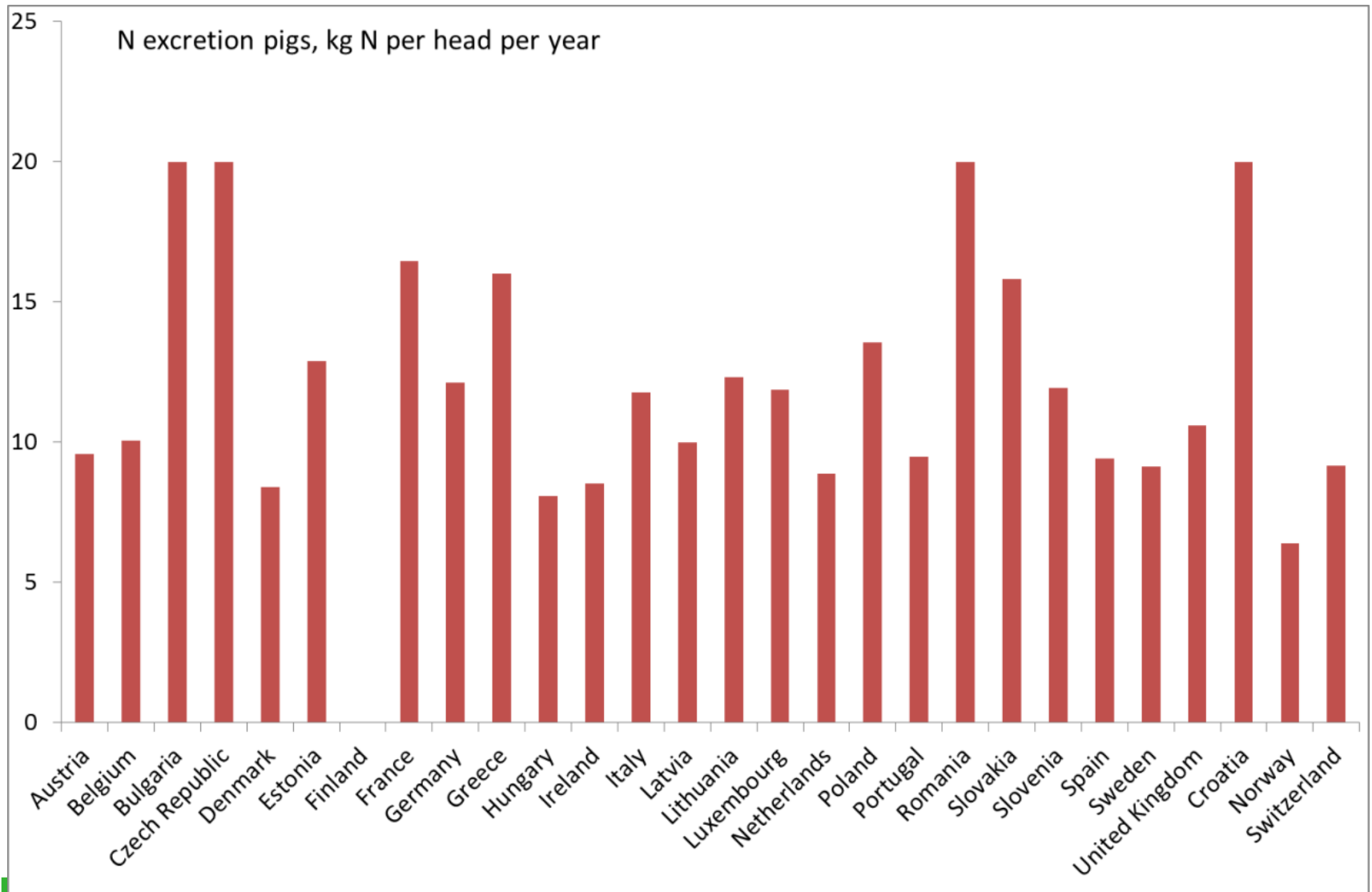
Calculation of emissions and balances

- Data related to N inputs and outputs
 - From statistics (national and Eurostat)

- Coefficients and N emission factors
 - Guidebooks and scientific literature
 - Need for country-specific data and coefficients

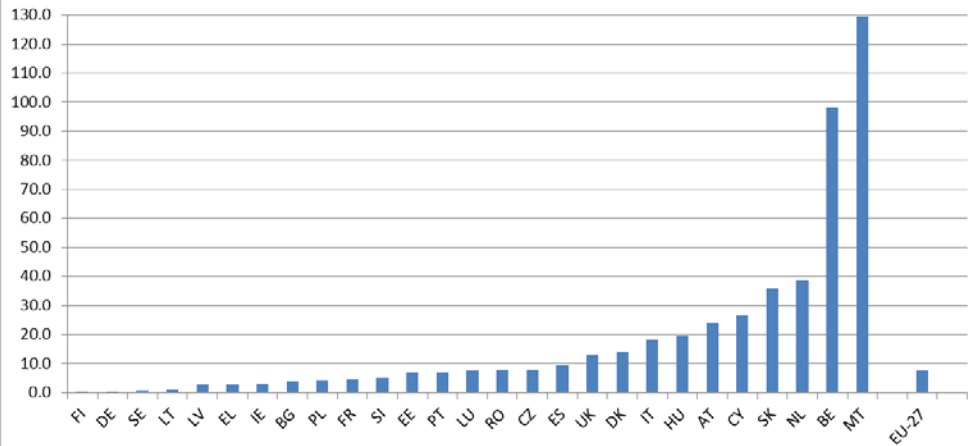
- Harmonisation of data collection and processing needed
 - Common approaches for member states
 - Agri-Environmental Indicators
 - Diredate project Eurostat, 2012

Example: excretion factors pigs in NIR 2011



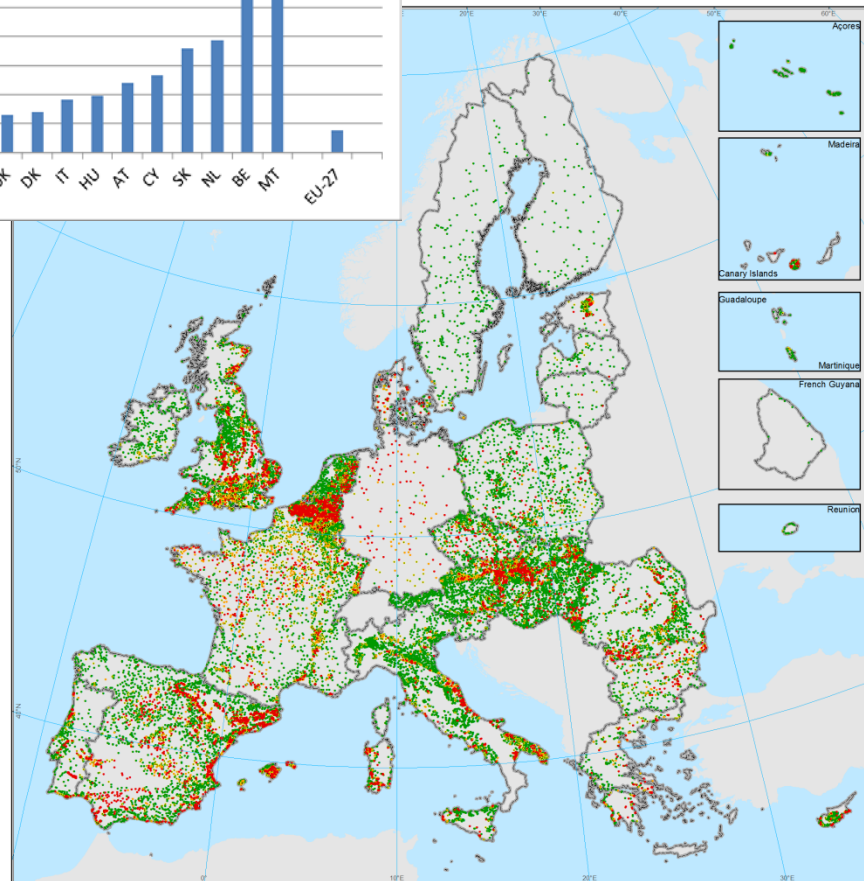
Measurements of N in water

Groundwater stations per 1000 km2 land



Differences in monitoring networks, e.g. water monitoring

NITRATES DIRECTIVE EU-27
REPORTING PERIOD 5 (2008-2011)



GROUND WATER
ANNUAL AVERAGE NITRATE CONCENTRATION

- Avg NO3 mg/l
- < 25
 - 25 - 40
 - 40 - 50
 - >= 50

Source: European Commission, monitoring Nitrates Directive

Conclusions (i) Agriculture

- Information about N is needed for optimal management of crops, animals and soil
- Lot of data is already available and new sources of information are emerging
- The challenge is to use data for nutrient management under practical farming conditions, taking interactions between factors and weather conditions into account

Conclusions (ii) Environment

- Need for quantification and monitoring of N emissions

- Methods for calculation of N emissions available
 - Defaults for data and coefficients available
 - Need for detailed and region/country specific data

- Monitoring of air and water quality
 - Monitoring networks not harmonized

- Potentials to harmonize data collection for different policies

Thank you!

