



# Germany: Nitrogen management strategies

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# German Advisory Council on the Environment

Interdisciplinary, scientific and independent

Seven professors from different disciplines  
nominated by Cabinet

Judgements on environmental issues

Early warning function

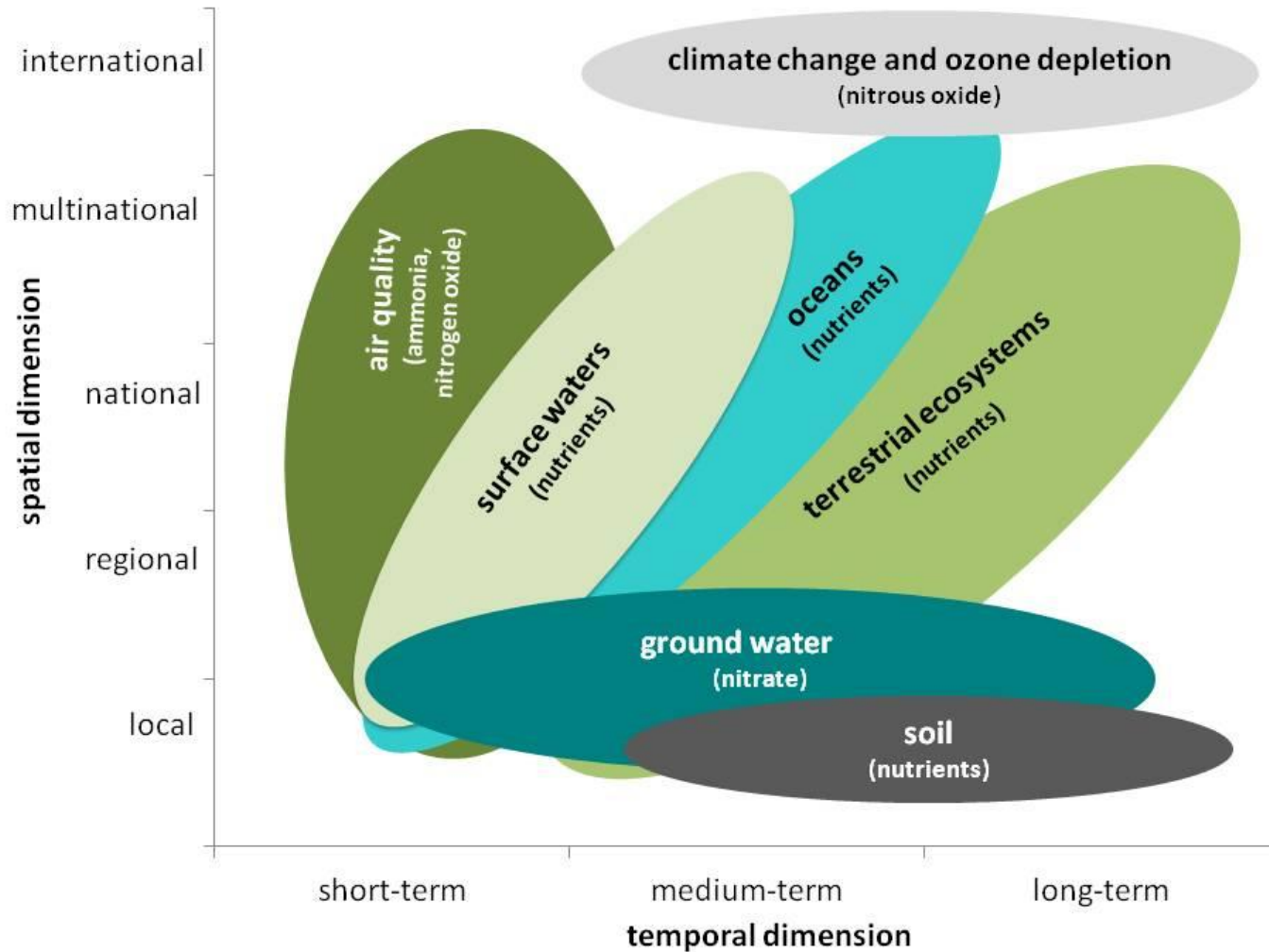
Ideas for sustainable transitions

Inform stakeholders and the broader public



*An important issue with multiplex dimensions*

# Reactive Nitrogen



*Areas of activity*

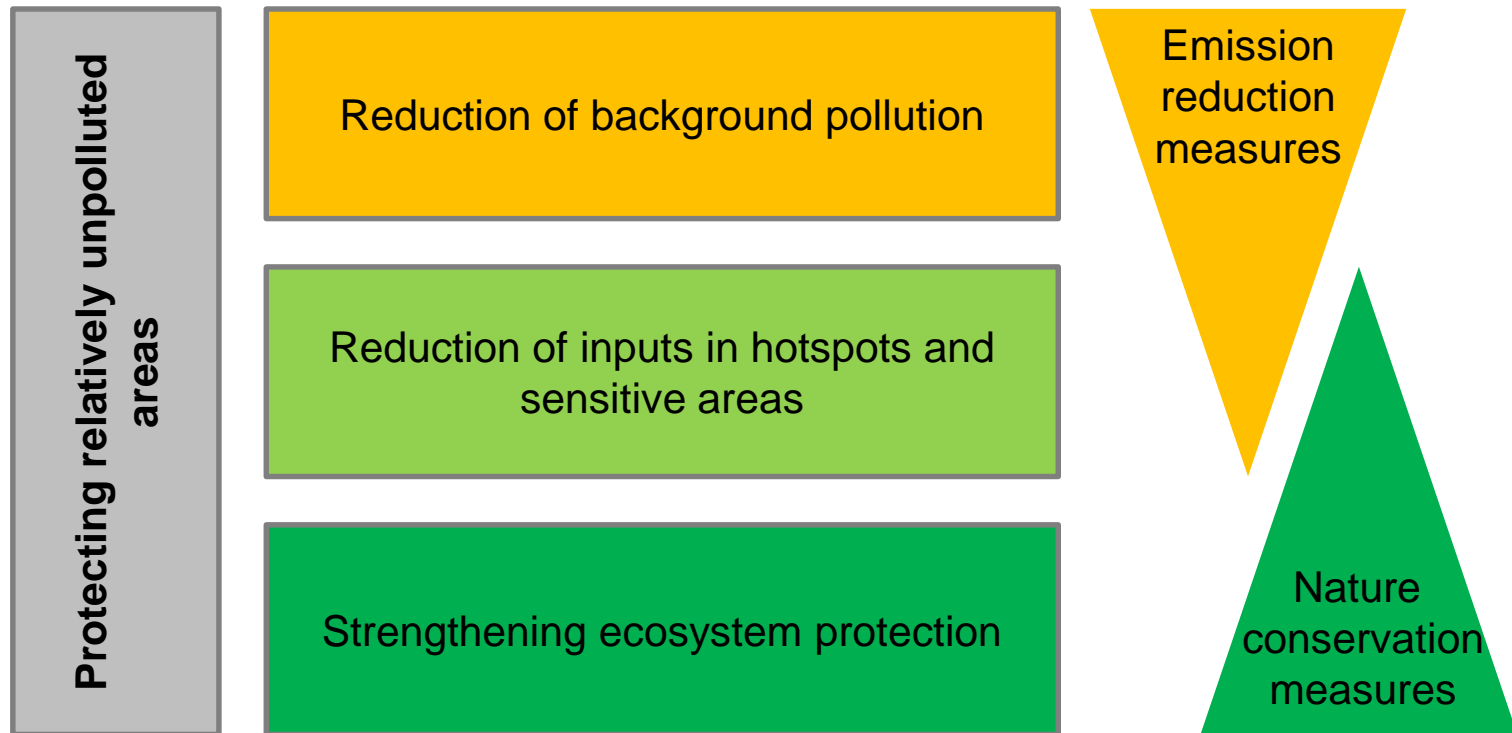
# Recommendations

- **Clean air policies: draft of a NERC directive**
- **Implementation of Water Framework Directive**
- **Reform of EU Agriculture Policy (CAP)**
- **Reform of the Fertilizer Regulation**
- **Raise a tax on nitrogen surplus**
- **Nature protection measures**
- **Make biogas production environmentally sustainable**
- **Change food consumption pattern**
- **Reshape the transportation sector**
- **Reduce power plant emissions**
- ...



*How to reduce effects of reactive nitrogen pollution*

# Four complementing approaches



*SRU Recommendations for the development of a*  
**National Nitrogen Strategy**

**Better horizontal integration**

(environment, agriculture, transport, industry)

**Better vertical integration**

(EU, national, federal states)

**Systemic approach**

**Public attention**

**Raising awareness**



# National N Strategy

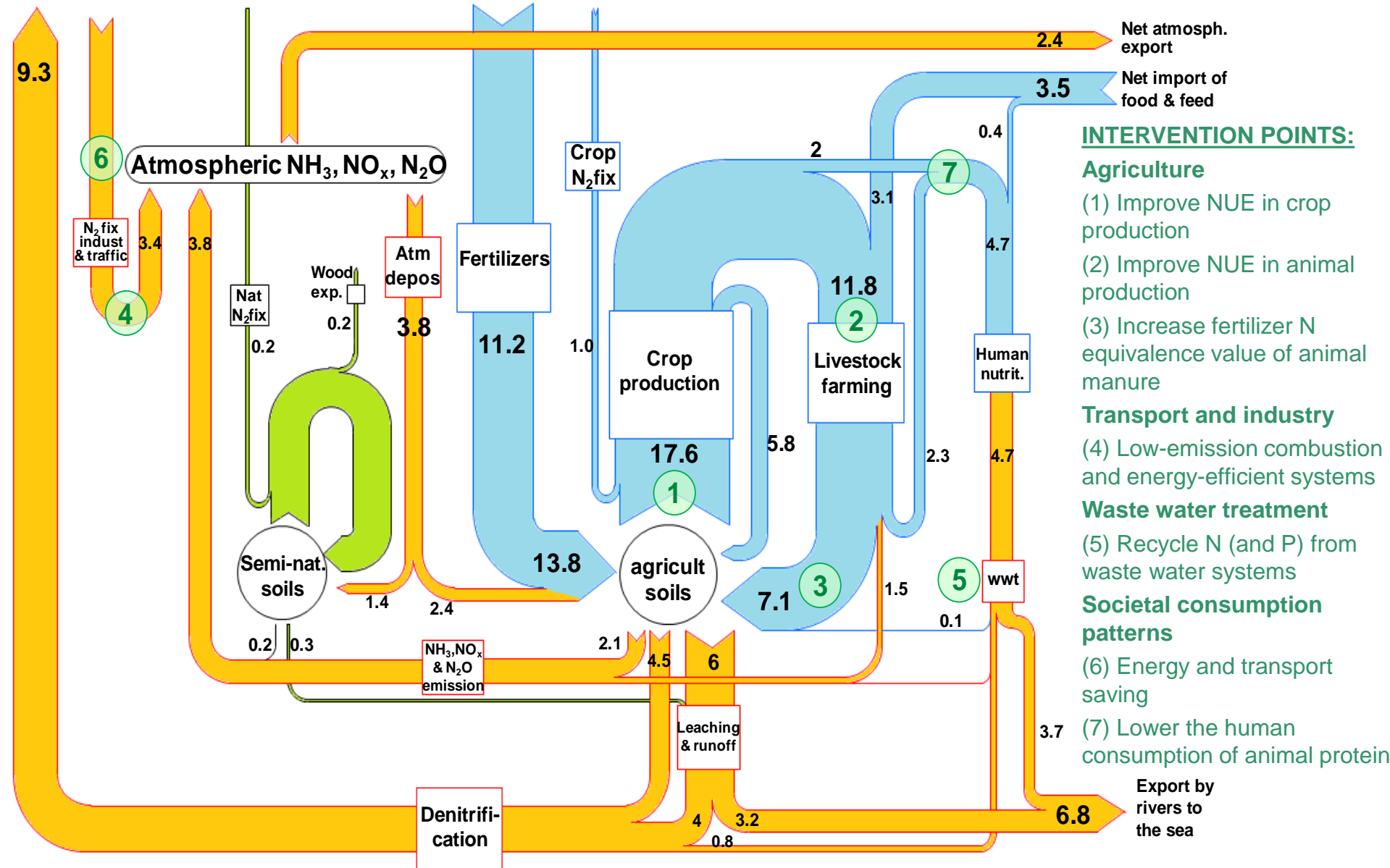
- Policy need: N related targets are not being met
- Building on SRU Report and UBA Strategy
- Environment Ministry with other Ministries and Federal States
- Starting now, target date 2016
- 7 priority intervention points →  
not limited to agricultural systems and measures!



# Summary of N flows in Europe

modified from: Sutton et al. (2011): European Nitrogen Assessment

## Atmospheric N<sub>2</sub> pool



### INTERVENTION POINTS:

#### Agriculture

- (1) Improve NUE in crop production
- (2) Improve NUE in animal production
- (3) Increase fertilizer N equivalence value of animal manure

#### Transport and industry

- (4) Low-emission combustion and energy-efficient systems

#### Waste water treatment

- (5) Recycle N (and P) from waste water systems

#### Societal consumption patterns

- (6) Energy and transport saving
- (7) Lower the human consumption of animal protein



# Average share of N compounds and sectors in total emissions to air and water in Germany, ~2005-2011

Source: UBA (2015): Reactive Nitrogen in Germany: Causes and effects – measures and recommendations

|   | Air             |                 |                  | Water  |      |           |
|---|-----------------|-----------------|------------------|--|------|-----------|
| [Gg N a <sup>-1</sup> ]                             | NO <sub>x</sub> | NH <sub>3</sub> | N <sub>2</sub> O | NO <sub>3</sub> <sup>-</sup> /<br>NH <sub>4</sub> <sup>+</sup> | Sum  | Share [%] |
| Agriculture   | 33              | 435             | 88               | 424  | 980  | 63        |
| Traffic   | 192             | 13              | 2                | -  | 207  | 13        |
| Industry/ Energy                                    | 166             | 15              | 27               | 10   | 218  | 14        |
| Households/<br>Sewage Treatment/<br>Surface Runoff* | 21              | 1               | 6                | 135  | 163  | 10        |
| Sum   | 412             | 464             | 123              | 569  | 1568 | 100       |
| Share [%]   | 26              | 30              | 8                | 36   | 100  | [%]       |



# National N Strategy

- Policy need: N related targets are not being met
- Building on SRU Report and UBA Strategy
- Environment Ministry with other Ministries and Federal States
- Starting now, target date 2016
- 7 priority intervention points →  
not limited to agricultural systems and measures!
- Will contain targets, measures, instruments with timelines
- Will refer and contribute to EU and international processes



# Governance levels and instruments

## taking **air** regulations as an example

- EU emissions regulated by EU legislation:
  - $\text{NO}_x > 75\%$
  - $\text{NH}_3 < 25\%$
  - $\text{N}_2\text{O}$  only for industry, otherwise indirectly Climate Change
- Combined with trends and LRT → increasing importance of...
  - Agriculture vs. industry, traffic etc.
  - Gothenburg Protocol, NE(R)CD and management guidance



# For further discussion

- Issue framing, communication
- Authorizing environment
- Consistency of regulatory activity with N fluxes and loss pathways
- Agricultural vs. non-agricultural sectors
- Technical vs. management solutions
- Implementation on different governance levels



Bundesministerium  
für Umwelt, Naturschutz,  
Bau und Reaktorsicherheit



*Thank you*

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