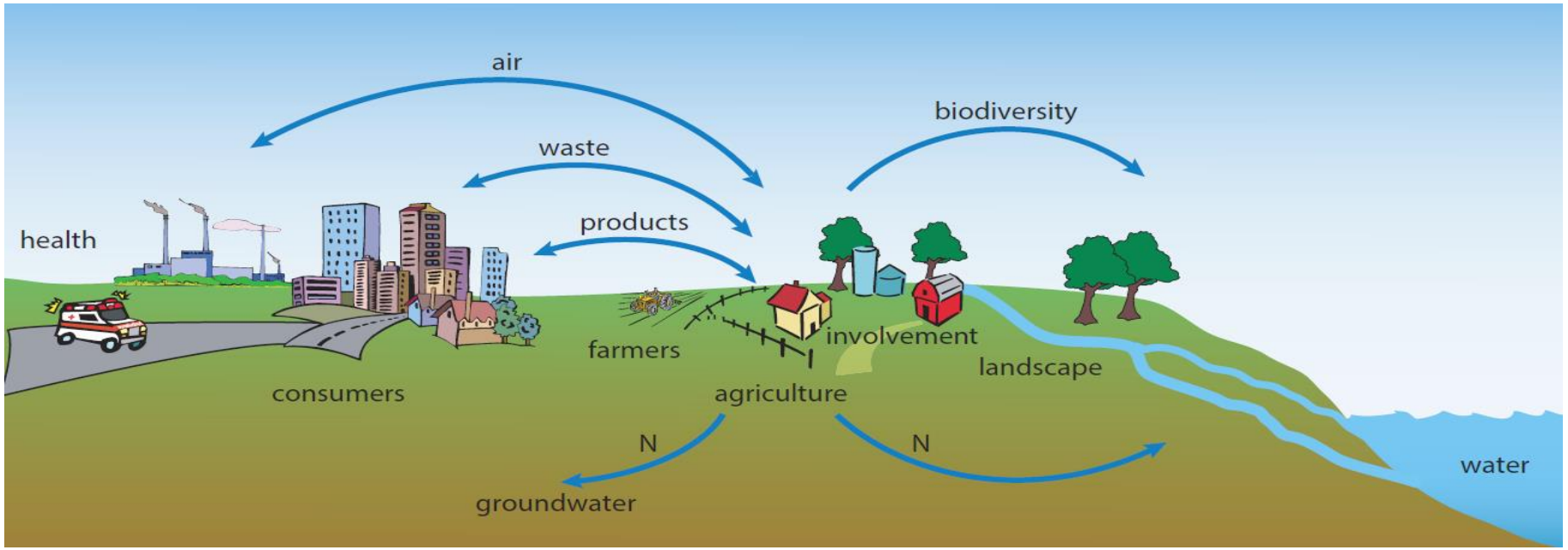
Innovative solutions for Sustainable Nitrogen Management



Tommy Dalgaard *et al.*, Aarhus University, Department of Agroecology

International conference on Innovative Solutions for Sustainable Management of Nitrogen
Aarhus University, Denmark, June 25-28 2017

Innovative solutions for Sustainable Nitrogen Management

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http://sustainablenconference.dnmark.org/

Panel debate

Reduced conference N-footprint

Planning for the conference, the focus has been on reducing our N-footprint by:

- **Food initiatives**
- **Dialogue and collaboration on menu development with caters**
- **Engaging people; caters, researchers, collaborators**

Food initiatives

- Reduced meat/animal protein intake throughout the whole conference = **lower footprint ≈ 40%**
- Experiments with chefs/food providor to test ”circular food menu” where animal protein is substituted by plant or sea-based protein
- Food waste recirculation experiment at research biogas facility

Dagen blev afsluttet med et såkaldt 'cirkulært måltid' med bæredygtige ingredienser.
Billede 8 af 8

Low N lunch during the excursion

Including nice sea weed rome fromages

Enjoyed by Shabtai

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Sustanable circular economy solutions

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The Climate Planet

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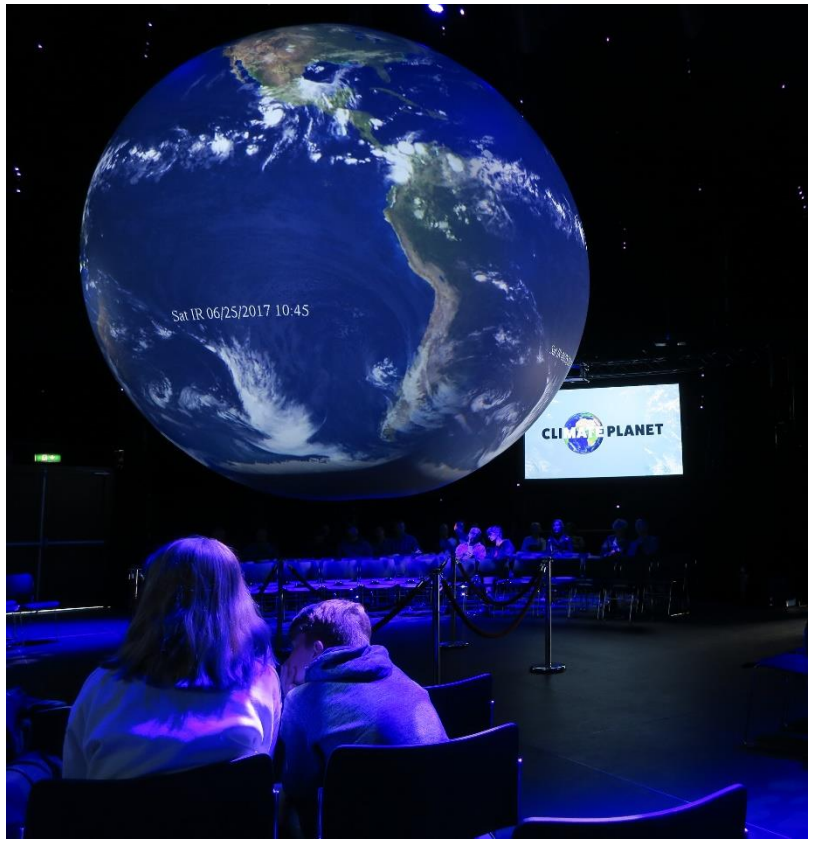
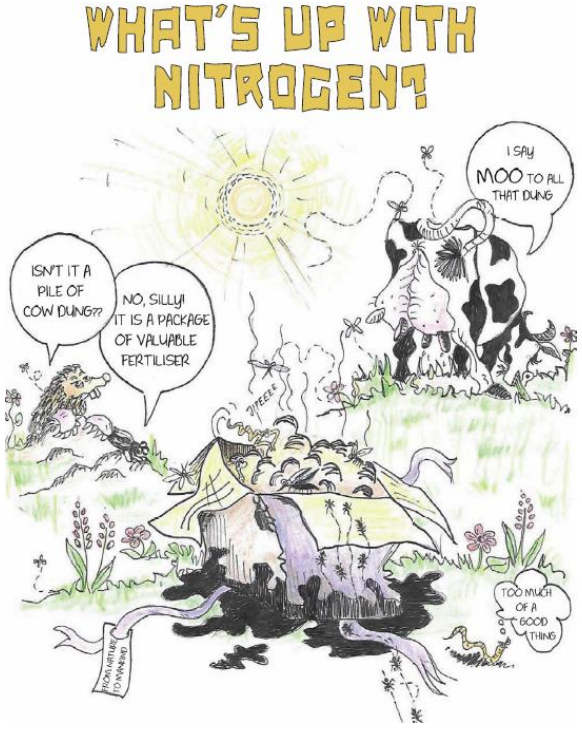


The meeting

- **Aarhus 2017: Sustainability core value**
- **Sustainable water, food and transport**
- **Knowledge about sustainable N solutions:**



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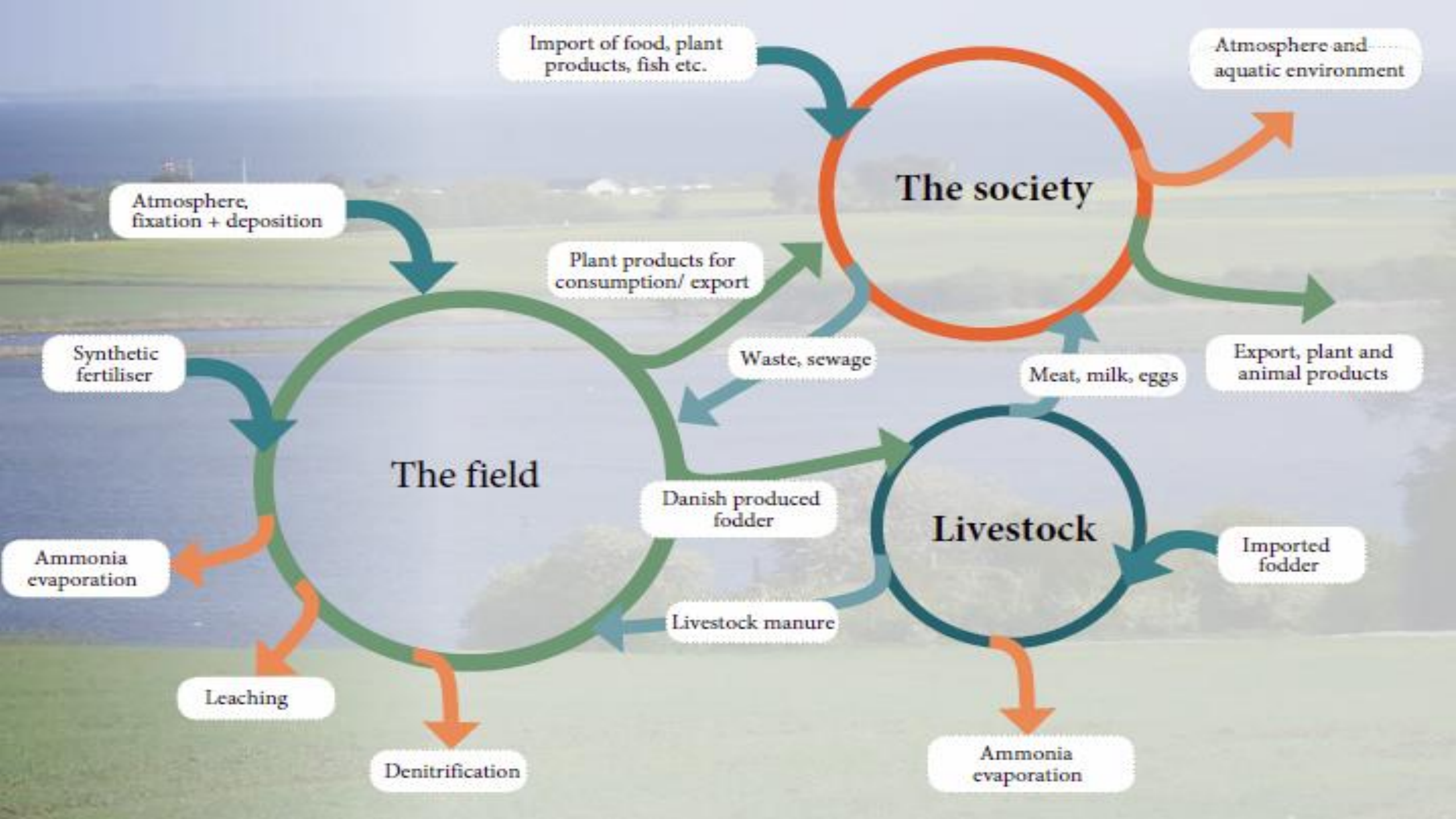
2017
EUROPEAN CAPITAL
OF CULTURE


Import of food, plant products, fish etc.
Atmosphere and aquatic environment
The society
Atmosphere, fixation + deposition
Plant products for consumption/ export
Synthetic fertiliser
Waste, sewage
Meat, milk, eggs
Export, plant and animal products
The field
Danish produced fodder
Livestock
Ammonia evaporation
Imported fodder
Livestock manure
Leaching
Denitrification
Ammonia evaporation

dNmark statement

- **The international scientific conference on ”Innovative solutions for sustainable management of nitrogen”**
- **Involved *142 stakeholders from 27 nationalities gathered in Aarhus, Denmark, June 2017***

dNmark research alliance

dNmark statement

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Acknowledging:

The ongoing need to explore <u>new ways</u> to <u>sustainable use of nitrogen for the mutual benefit of the environment, the economy and the human society</u>

Notes

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We discussed that:

- ”New ways” should be explored through interactions with stakeholders, representing (hyper) local, regional, national as well as international perspectives.
- “Sustainable use of nitrogen” imply improved resource efficiency and the development of resilient production systems as well as reduced environmental, climatic and public health impacts etc.

Notes

Moreover, it was noted that:

- "Mutual benefit" means positive effects for future research, policy making, industry development, and decisions made at all scales incl. by interest groups and citizens.
- "benefit for the environment, the economy and the human society" include a sustainable balance of biobased food, energy and materials production, and effects on human well-being, public health, environment, nature, cultural landscape development and other side-effects.

Notes

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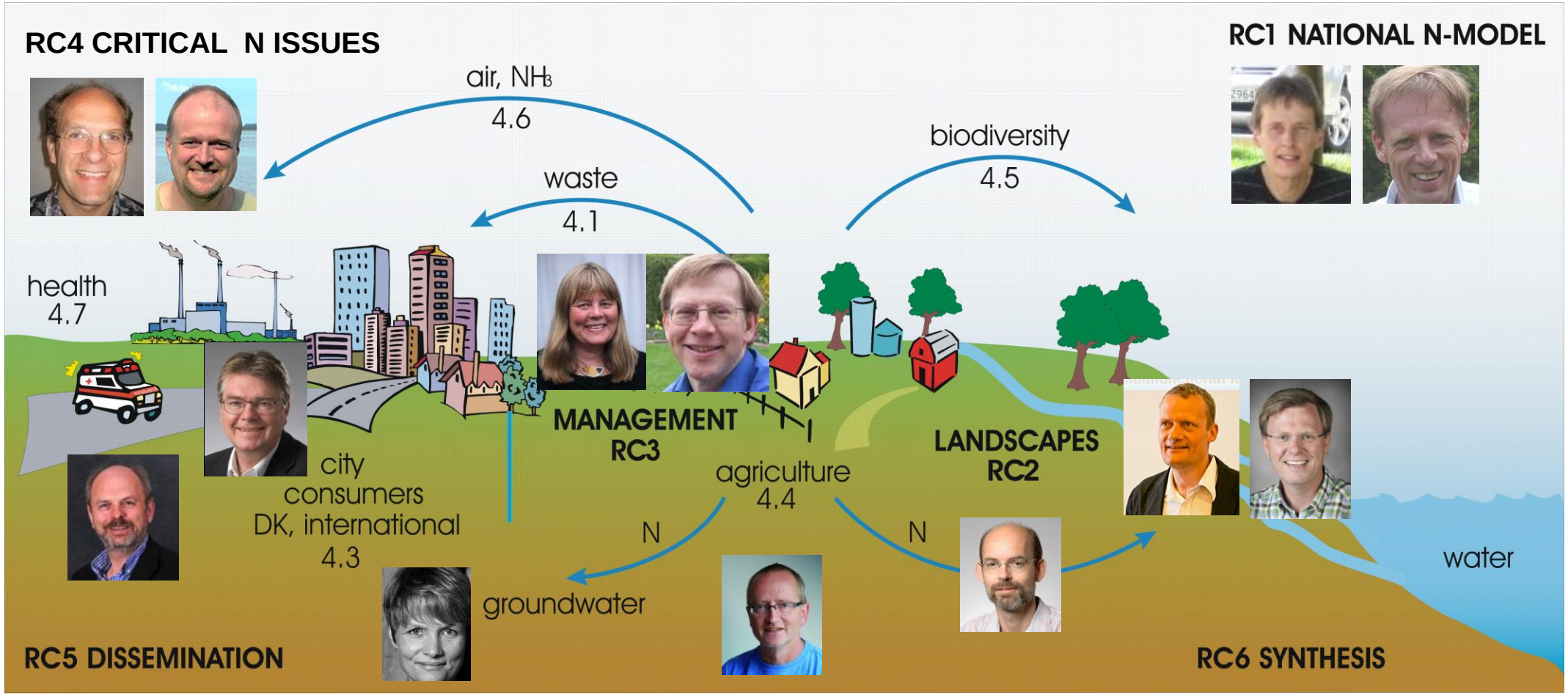
And it was concluded that:

- Current measures to reduce nitrogen losses to the environment often risk to fail or cause new problems
- Further research is therefore requested on sustainable solutions to the problems related to nitrogen
- This include the further development of **joined-up nitrogen guidance for air, water and climate co-benefits** etc.

Facts Sheets, research briefs etc.
+ Special issue to come

dNmark research alliance



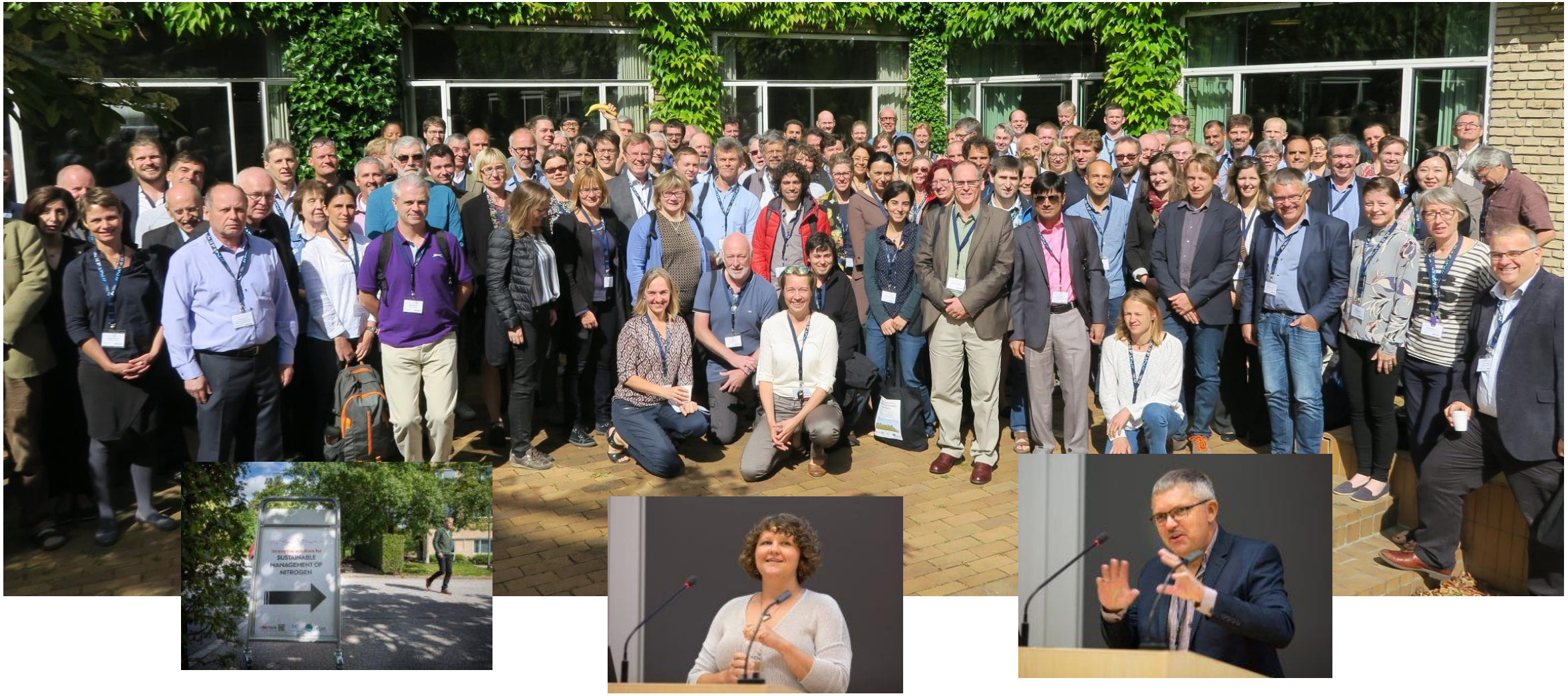
The Danish Council for Strategic Research

-thanks to grants from

InnovationsFonden
FORSKNING, TEKNOLOGI & VÆKST I DANMARK

AARHUS UNIVERSITY RESEARCH FOUNDATION
AARHUS UNIVERSITETS FORSKNINGSFOND

Thank you for a fantastic conference



http://sustainablenconference.dnmark.org/

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Research Campus Foulum

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Next nitrogen conference opportunties:

International Interdisciplinary Conference on
Land Use and Water Quality
Reducing Effects of Agriculture
The Hague, the Netherlands, 10–13 June 2013

170 participants
from 30 countries

International Interdisciplinary Conference on
Land Use and Water Quality
Agricultural Production and the Environment
Vienna, Austria, 21–24 September 2015

175 participants
from 31 countries

International Interdisciplinary Conference on
Land Use and Water Quality
Effect of Agriculture on the Environment
The Hague, the Netherlands, 29 May–1 June 2017

195 participants
from 29 countries

International Interdisciplinary Conference on
Land Use and Water Quality
Effect of Agriculture on the Environment
Aarhus, Denmark, 2 June – 6 June 2019

Forecast –
so we need you:
250 participants
from 32 countries

N workshop Rennes, France
25-28 June 2018!

- and LUWQ June 2-6 2019 in Aarhus! + AU N Mangement summer university course 2018, 2019, 2020!

International Nitrogen Initiative

Bundesministerium
für Umwelt, Naturschutz,
Bau und Reaktorsicherheit

Umwelt Bundesamt

BestCities GLOBAL ALLIANCE

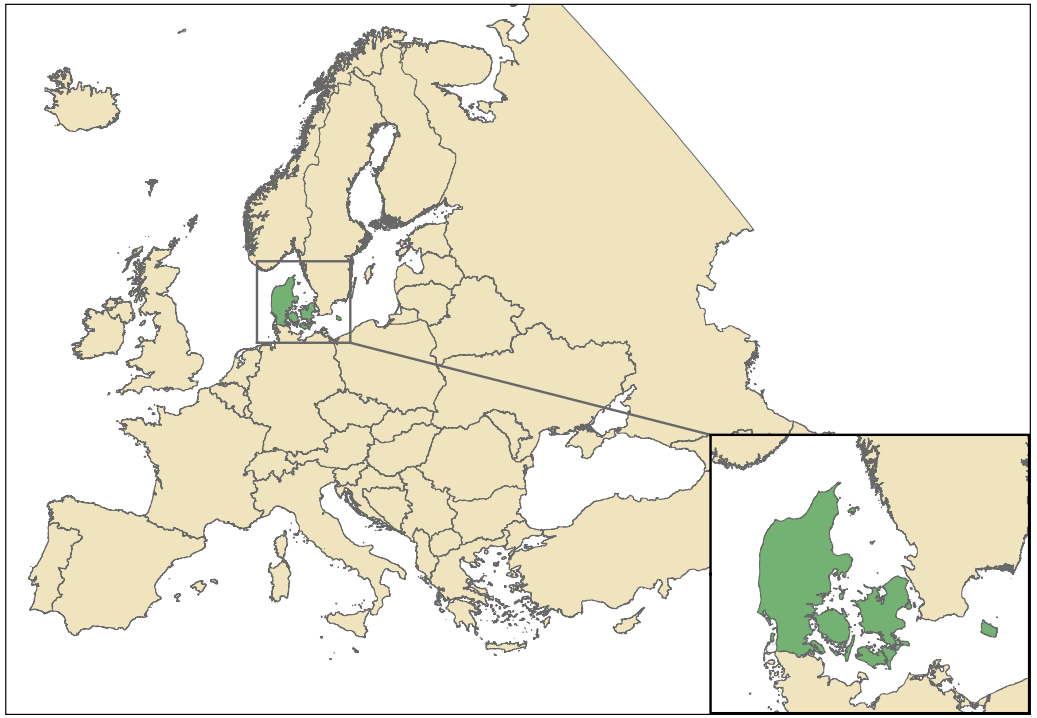
Visit Berlin Convention Office

1. *Netherlands*
2. *USA*
3. *China*
4. *Brazil*
5. *India*
6. *Uganda*
7. *Australia*
8. *Germany*

Danish agriculture as a critical case

- **2.6 mio ha agricultural land (61% of total area)**
- **5.6 mio people – 4.5 mill. t milk, 32 mill. pigs/yr (from this 13 mio piglets exported)**

- **Produce 3 times our own food consumption**
- **10 t milk/cow/yr**
- **31 piglets/sow/yr**
- **8 t wheat/ha/yr**
- **>8% organic agriculture**
- **7500 km coastline**



Danish agriculture as a critical case
for effective policy and management options

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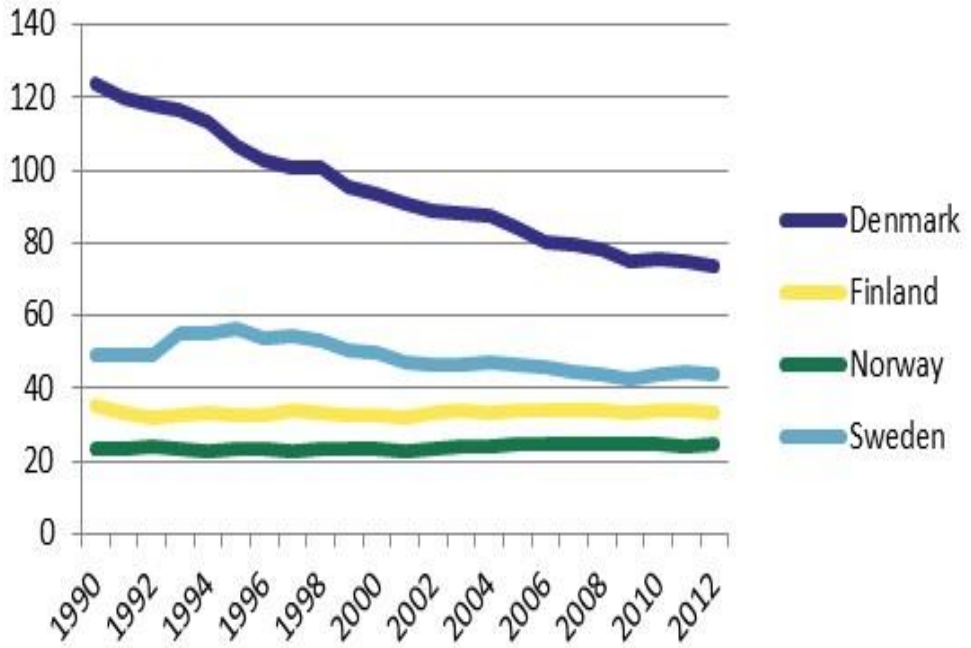
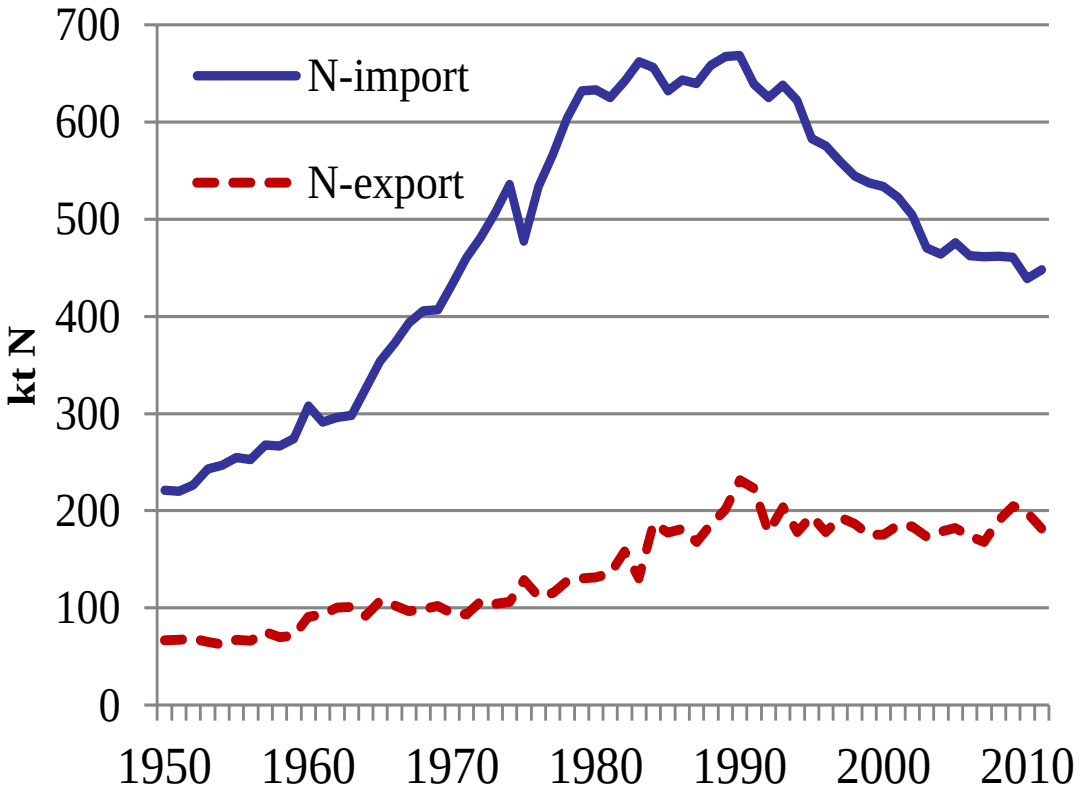
Ammonia

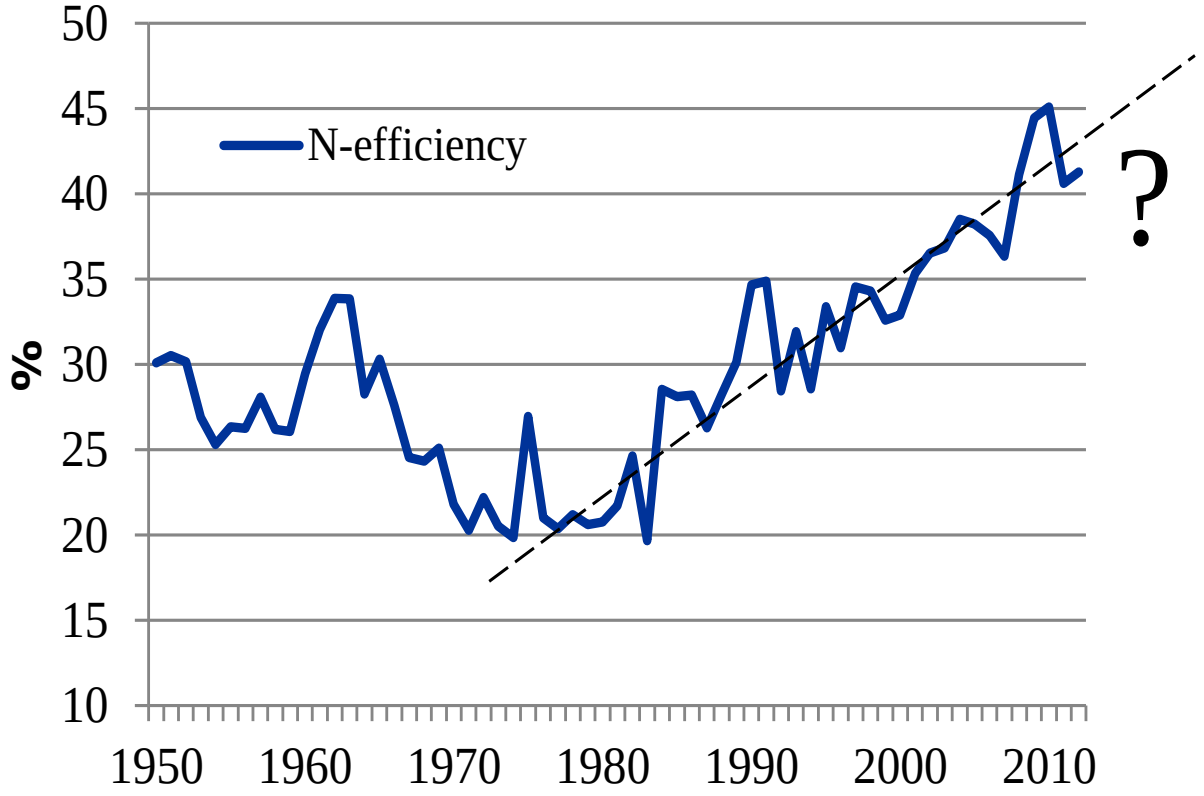


NOx

Helsten et al. (2017) Tema Nord report 2017:546

N surplus & efficiency in Danish agriculture





Dalgaard *et al.* Env. Research Letters 9 (2014)