

Drivers and effectiveness of sustainability governance of agricultural crop production at EU level

Niclas Scott Bentsen
Inge Stupak

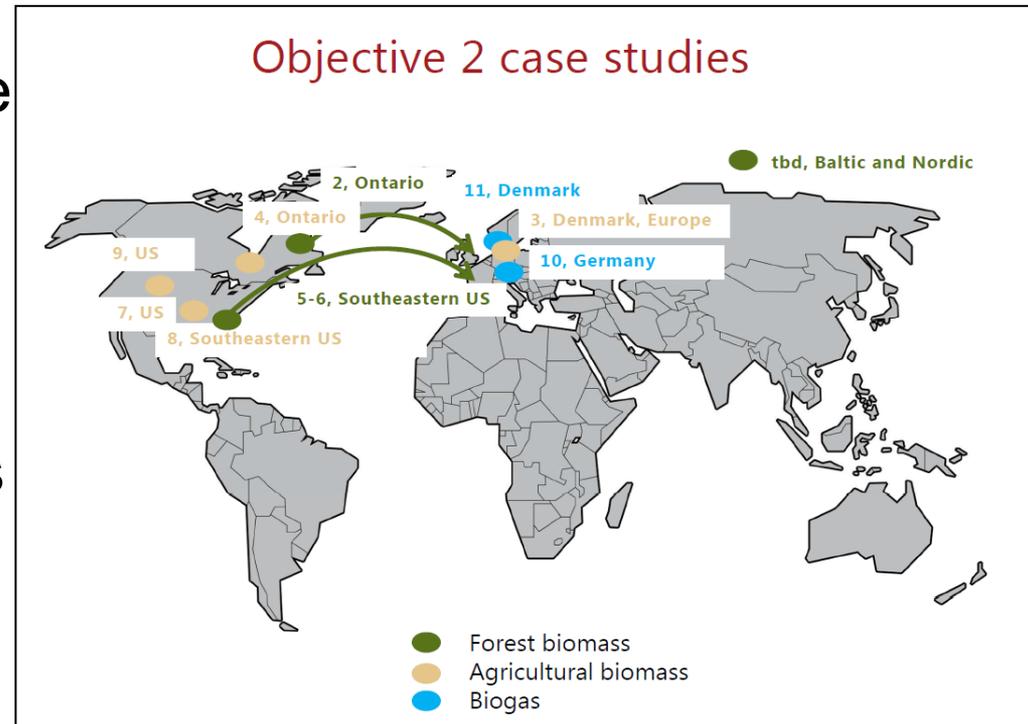
University of Copenhagen

UNIVERSITY OF COPENHAGEN



Objective and aim

Assess and compare the effectiveness, efficiency, and transparency of a variety of approaches to govern and verify sustainability of biomass and bioenergy supply chains

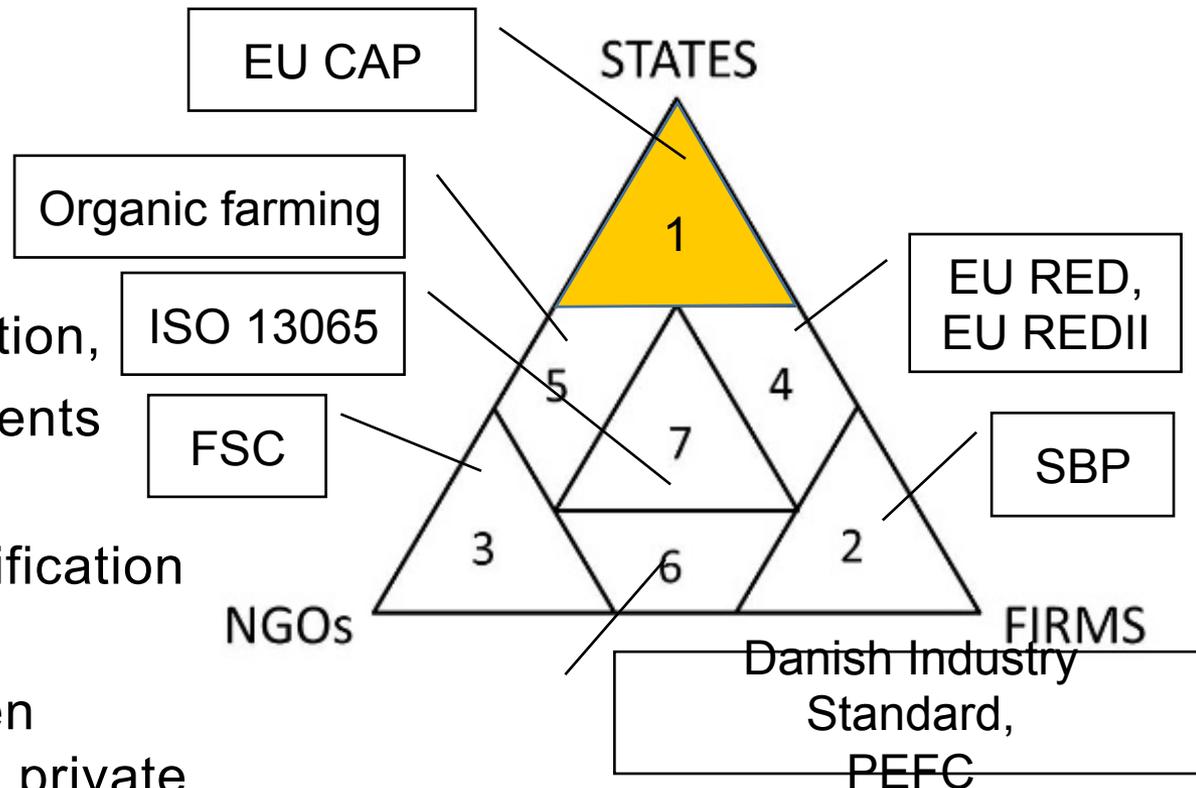


The aim of this paper is to identify the achievements, challenges and lessons learned in relation to sustainability governance of Danish agricultural crop production. As Danish regulation is closely linked to regulation by the European Union (EU), this is done in a broader geographical and political context

Approach

Governance defined to include:

- governmental regulation,
- international agreements and conventions,
- public or private certification systems,
- co-regulation between public regulation and private certification,
- standardization,
- company policies and CSR,
- national or organizations' best management practices,
- education programs etc.



THE GOVERNANCE TRIANGLE. The seven categories include 1) Traditional top-down legal standards, typically laws, 2) Self-regulation, 3) Third-party private regulation, 4) Standards of firms influenced by states (co-regulation), 5) Standards of NGOs influenced by states (co-regulation), 6) Joint efforts between firms and NGOs, 7) Joint efforts between firms, NGOs, and States (transnational regulation). Mansoor et al. (2016).

Limits to coverage

Governance of environmental sustainability is targeted.
Economic and social sustainability is disregarded.

Environmental sustainability exemplified by impacts on

- Greenhouse gas emissions
- Soil carbon stocks
- Water and water quality
- Biodiversity
- Land use change

EU Biodiversity targets



Halt the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restore them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss.

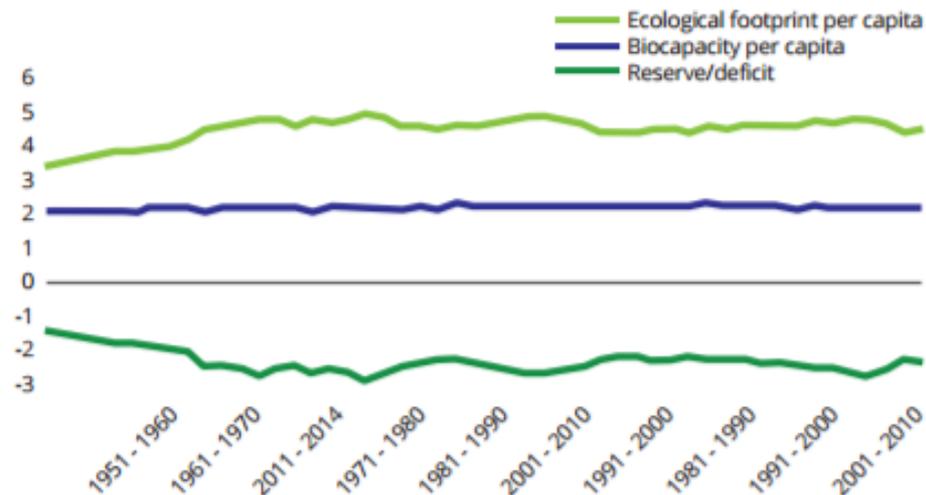
Regulating acts:

- Habitats Directive
- **Birds Directive**

Biodiversity monitoring and status

EU-28 ecological footprint is over twice the size of its biocapacity.

EU28 - Ecological footprint, biocapacity and reserve or deficit



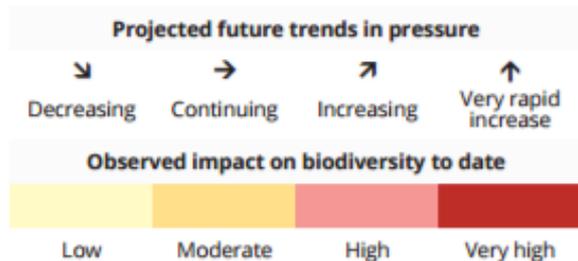
Ecosystems under pressure

Some major pressures on ecosystems are decreasing (e.g. atmospheric deposition of sulphur). However, other threats to ecosystems and their services persist and many pressures are increasing.

Trends in pressures on ecosystems

Ecosystem type	Habitat change	Climate change	Over-exploitation	Invasive species	Pollution and nutrient enrichment
Urban	↗	↑	↗	↗	↑
Cropland	↗	↑	↗	↗	↑
Grassland	↗	↑	↗	↗	↑
Woodland and forest	↘	↑	→	→	↗
Heathland, shrub and sparsely vegetated land	→	↑	→	↗	↗
Wetlands	→	↑	→	↗	↘
Freshwater (rivers and lakes)	→	↑	→	↗	↘
Marine (transitional and marine waters, combined)*	↗	↑	→	↗	→

* NB: results for marine ecosystem adjusted 09.07.2015



Biodiversity sub-target 3a:

Increase the contribution of agriculture to maintaining and enhancing biodiversity

Status:

No significant progress towards the target!

The continuing decline in the status of species and habitats of EU interest associated with agriculture indicates that greater efforts need to be made to conserve and enhance biodiversity in these areas.

The common agricultural policy (CAP) has an essential role to play in this process in interaction with relevant environmental policies.

The CAP reform for 2014-20 provides a range of instruments that can contribute to supporting biodiversity.

Opportunities need now to be taken up by Member States on a sufficient scale.

Local examples demonstrate successful sustainable agricultural practices. If implemented more broadly, they could put the EU back on track to achieve the target by 2020.

Biodiversity governance instruments

Natura 2000

Stretching over 18 % of the EU's land area and almost 6 % of its marine territory, it is the largest coordinated network of protected areas in the world

In practice

Natura 2000 is a network of core breeding and resting sites for rare and threatened species, and some rare natural habitat types which are protected in their own right.

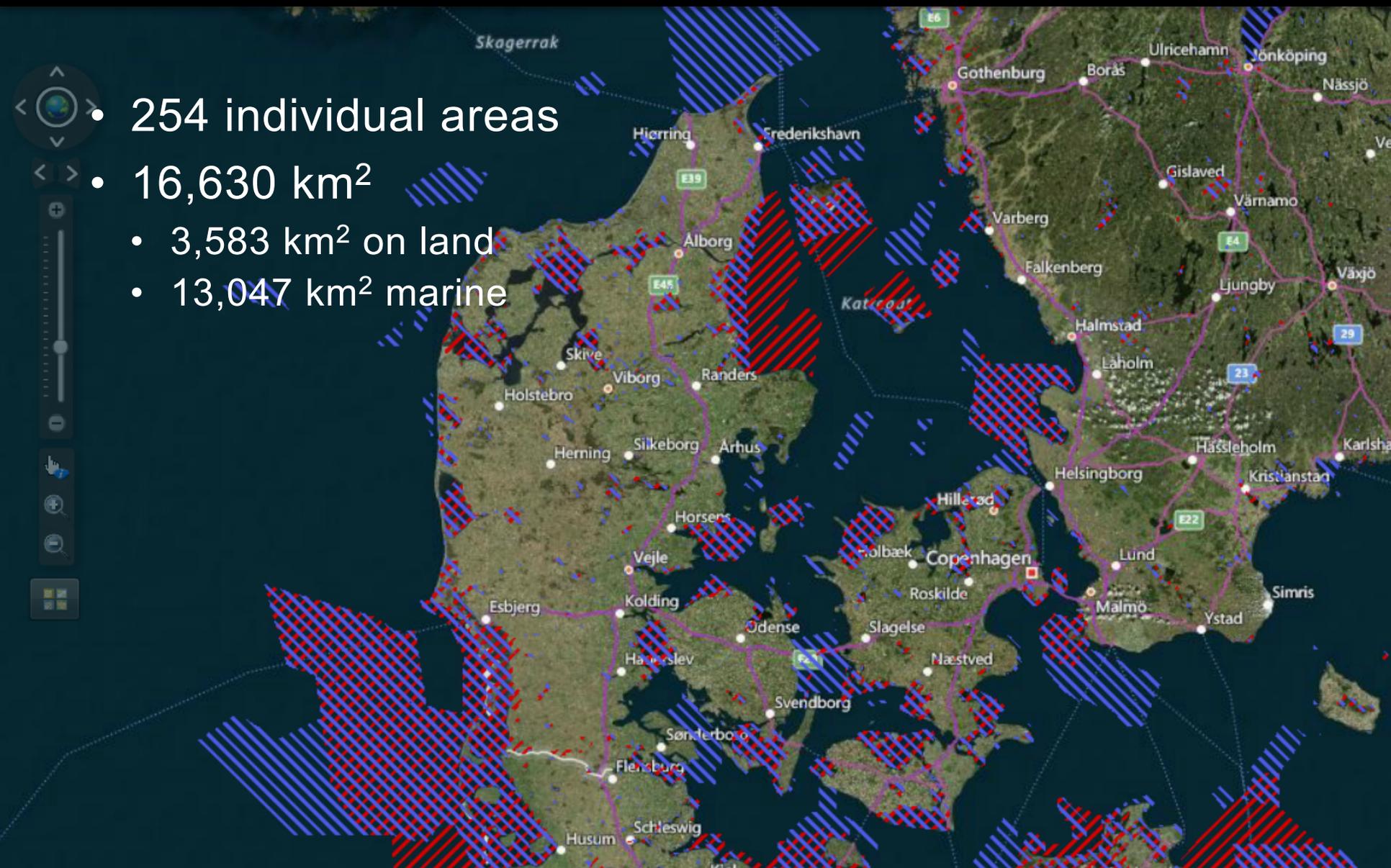
The aim of the network is to ensure the long-term survival of Europe's most valuable and threatened species and habitats, listed under both the [Birds Directive](#) and the [Habitats Directive](#).

Natura 2000 EU wide



Natura 2000 in Denmark

- 254 individual areas
- 16,630 km²
 - 3,583 km² on land
 - 13,047 km² marine



Biodiversity and land use

Habitat loss still a major concern

In the period 2006-2012, the expansion of artificial surfaces has continued (e.g. urban sprawl, infrastructure) as compared to the period 2000-2006.

Changes in ecosystems between 2006-2012

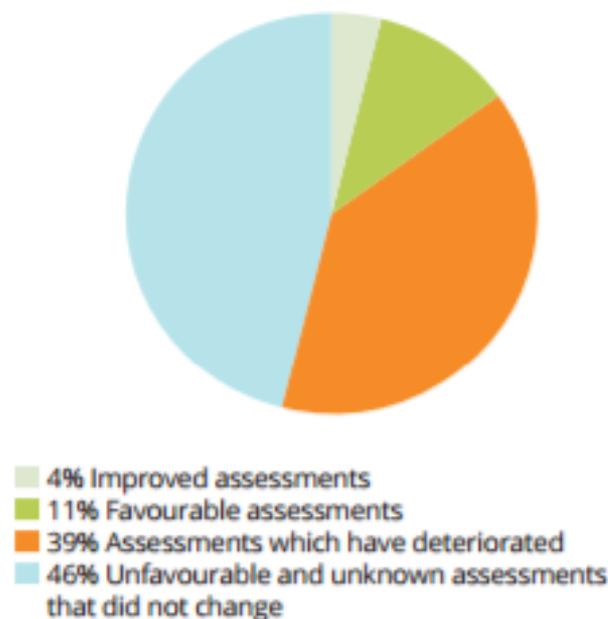


* Provisional results

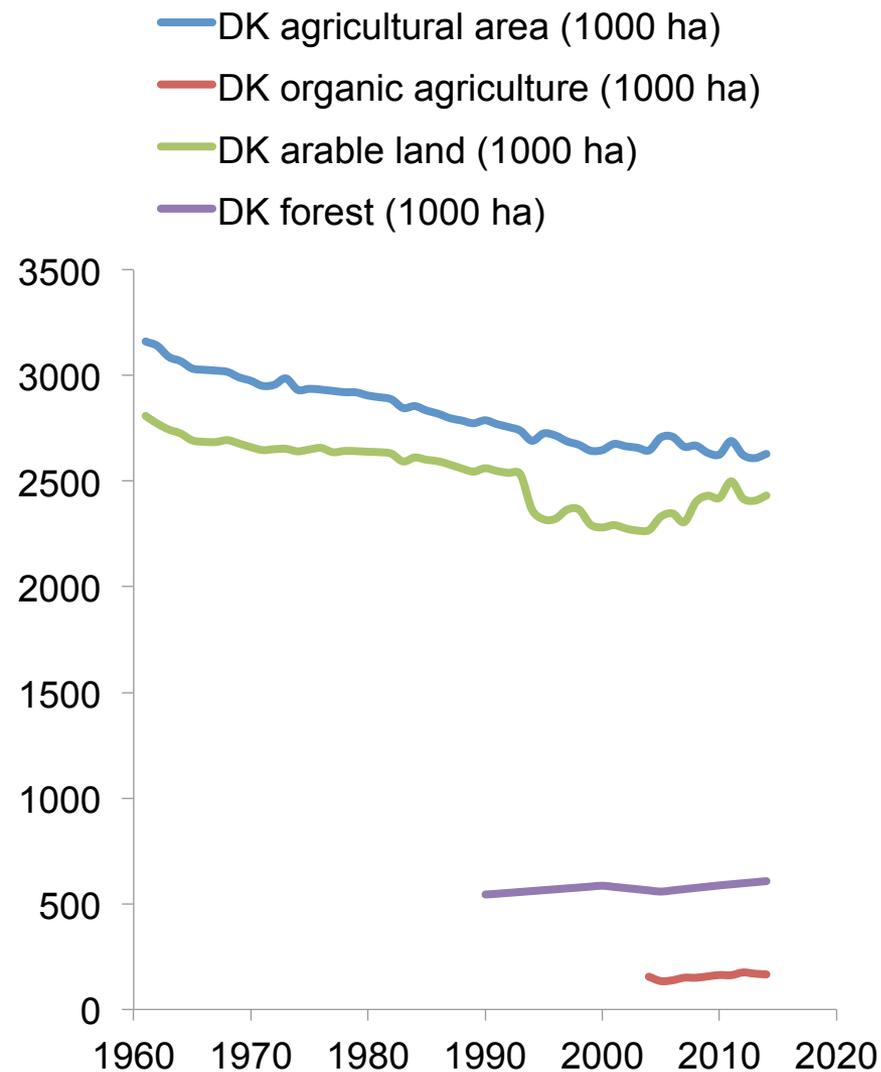
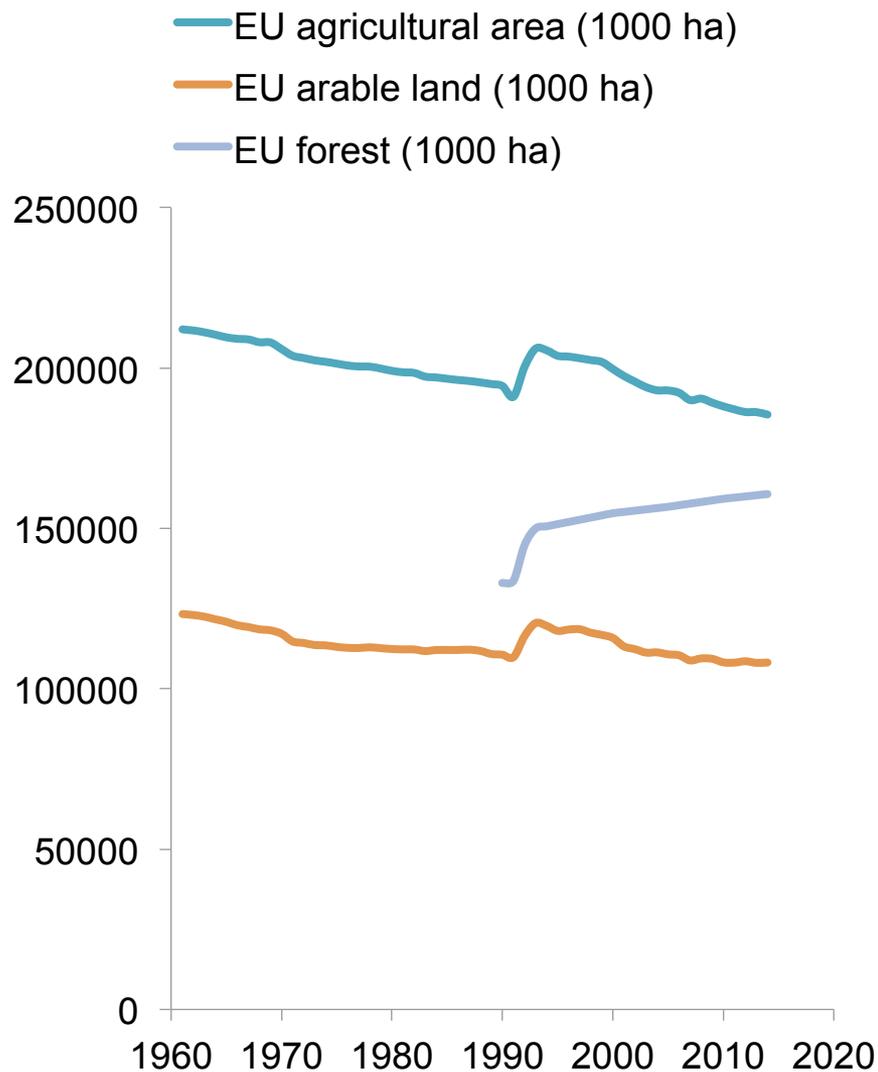
Intensive agriculture is still a major pressure

There has been no measurable improvement in the status of agriculture-related habitats and species covered by the nature legislation.

Change in conservation status of agriculture-related habitats



Land use status



EU Water quality governance history

- 1975: Standards for rivers and lakes used for drinking water abstraction
- 1980: Binding quality targets for our drinking water. It also included quality objective legislation on fish waters, shellfish waters, bathing waters and groundwaters.
- 1988: Frankfurt ministerial seminar on water reviewed the existing legislation and identified a number of improvements that could be made and gaps that could be filled.
- 1991: Urban Waste Water Treatment Directive, providing for secondary (biological) waste water treatment, and even more stringent treatment where necessary.
- 1991: Nitrates Directive, addressing water pollution by nitrates from agriculture.
- 1996: Directive for Integrated Pollution and Prevention Control (IPPC) addressing pollution from large industrial installations.
- 1998: a new Drinking Water Directive,

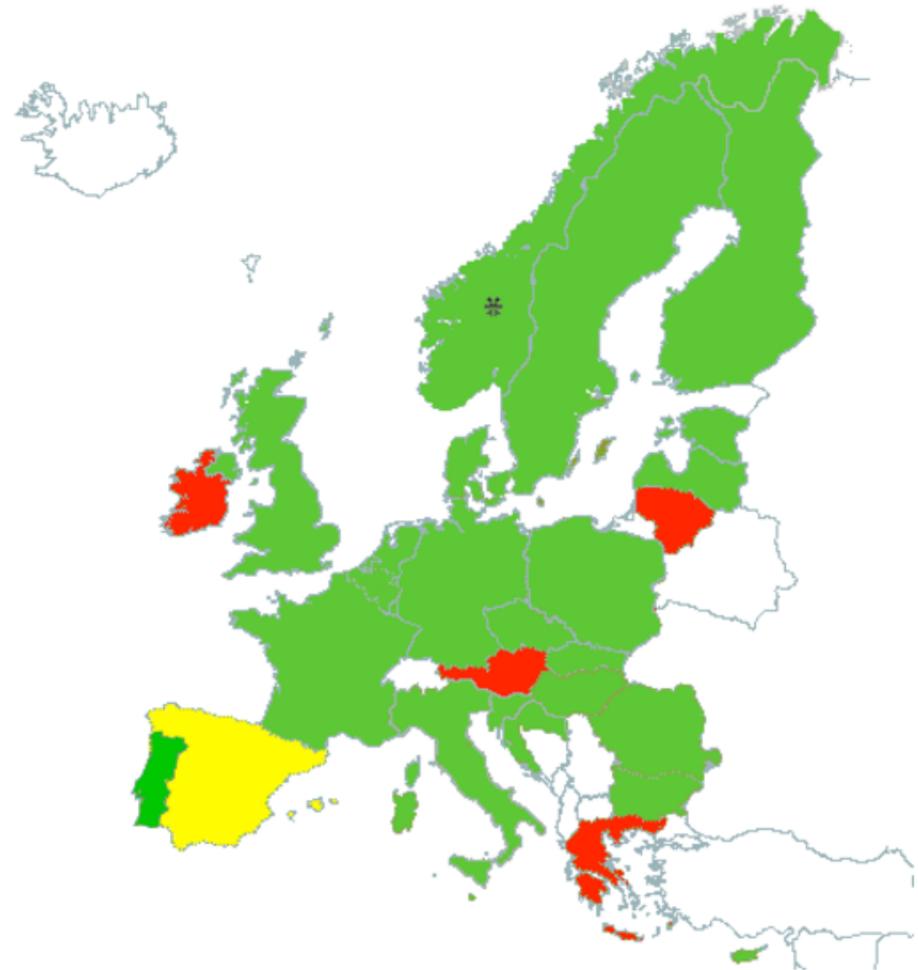
EU Water Framework Directive (WFD)

Adopted in December 2000

Governance instrument:

River Basin Management Plans

A single system of water management by river basin - the natural geographical and hydrological unit.



GREEN - all second River Basin Management Plans adopted

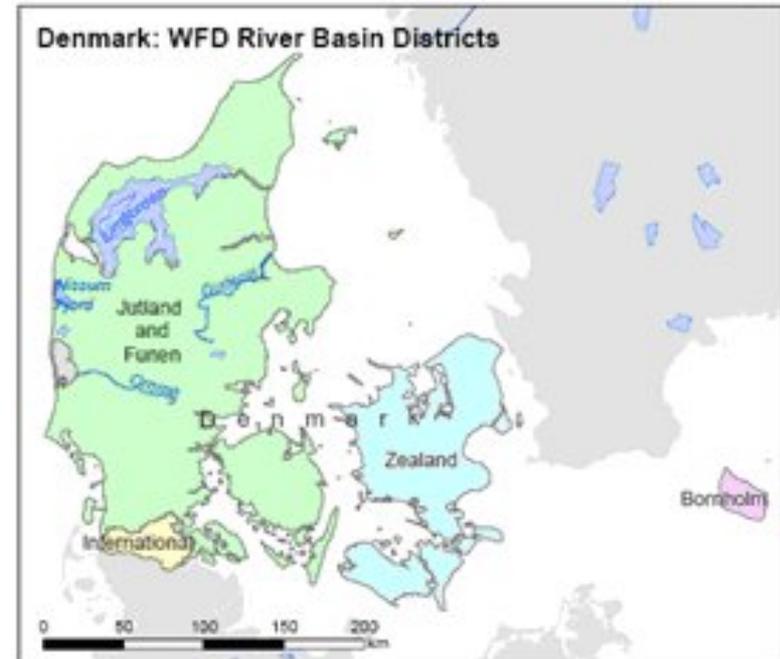
YELLOW - part of the second River Basin Management Plans adopted

RED - second River Basin Management Plans not yet adopted

Water quality governance in Denmark

2nd RBMPs (2016-2021)

- The four Danish RBMPs, GIS maps and statutory orders on environmental objectives and programmes of measures, are all available in Danish at
- The statutory orders on environmental objectives and programmes of measures that make up the legally binding parts of the planning instruments entered into force on 1 July 2016.
- The RBMPs were published on 27 June 2016 and took effect from 1 July 2016.

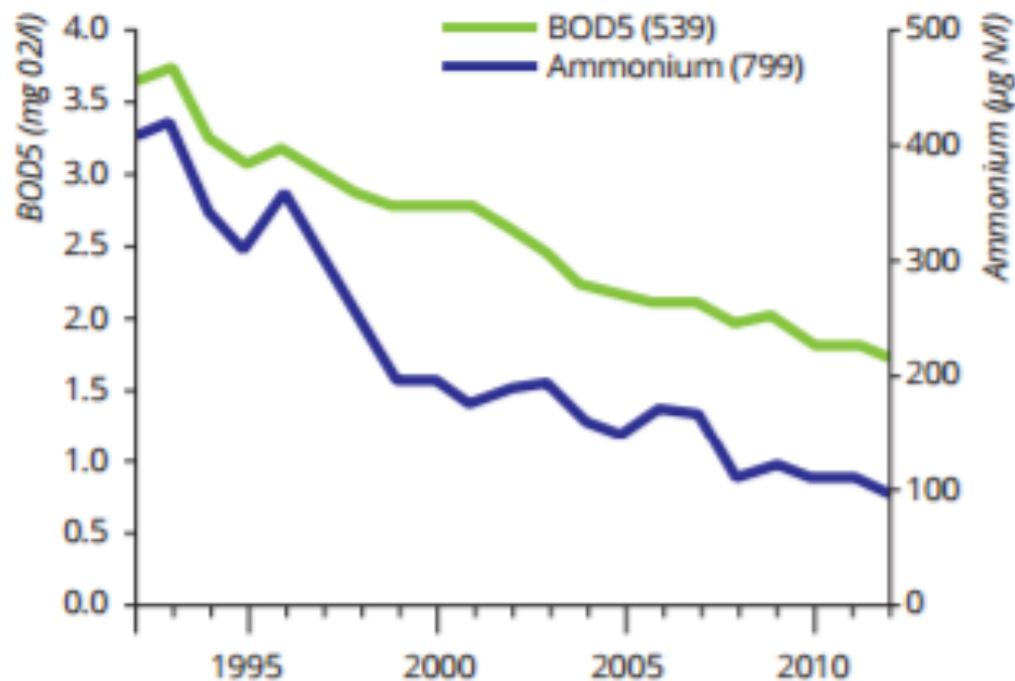


Water quality status

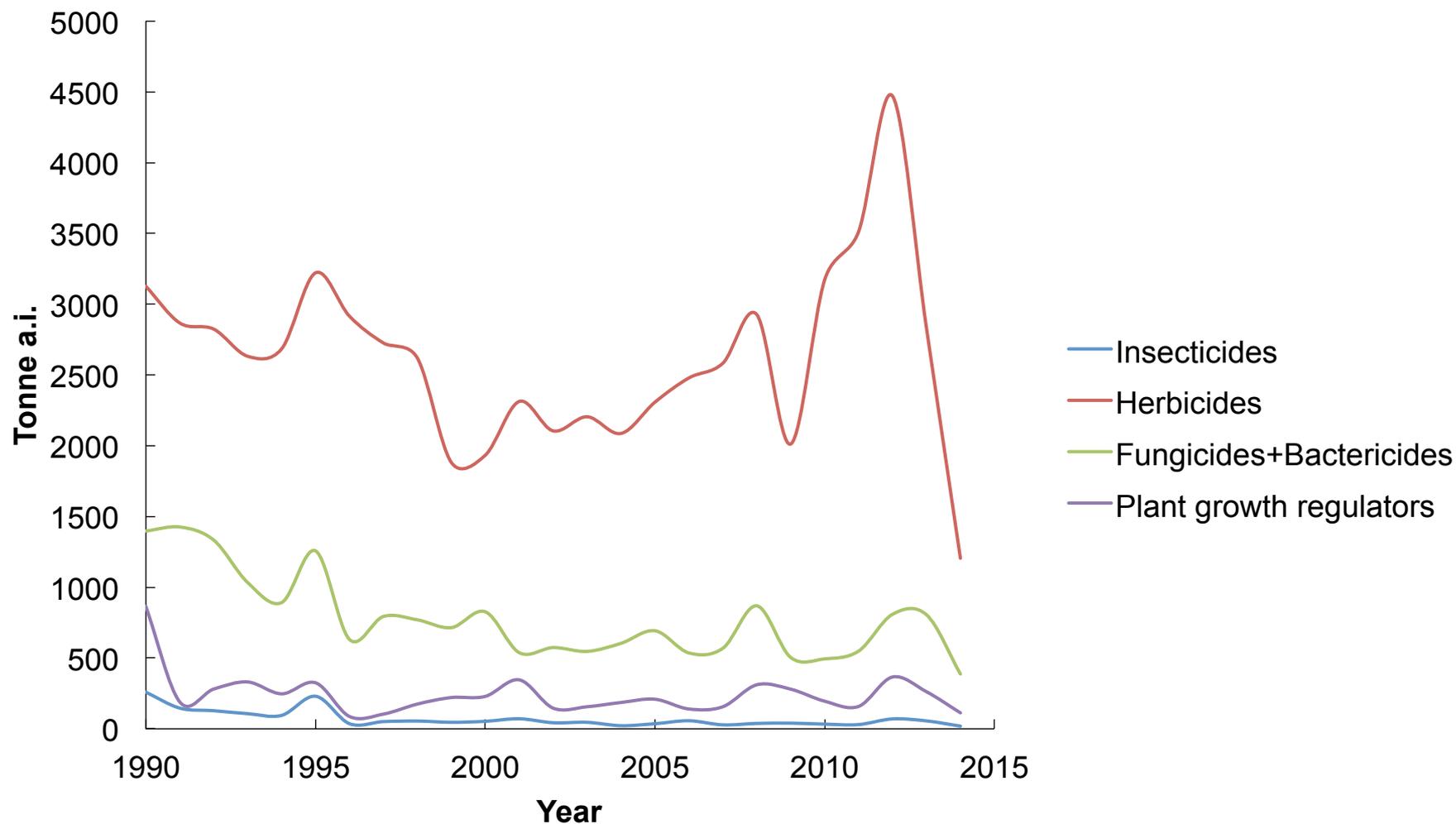
Pollution – improvements in some areas

Water quality in European rivers has improved for e.g. decrease of oxygen-consuming substances (BOD5), and ammonium.

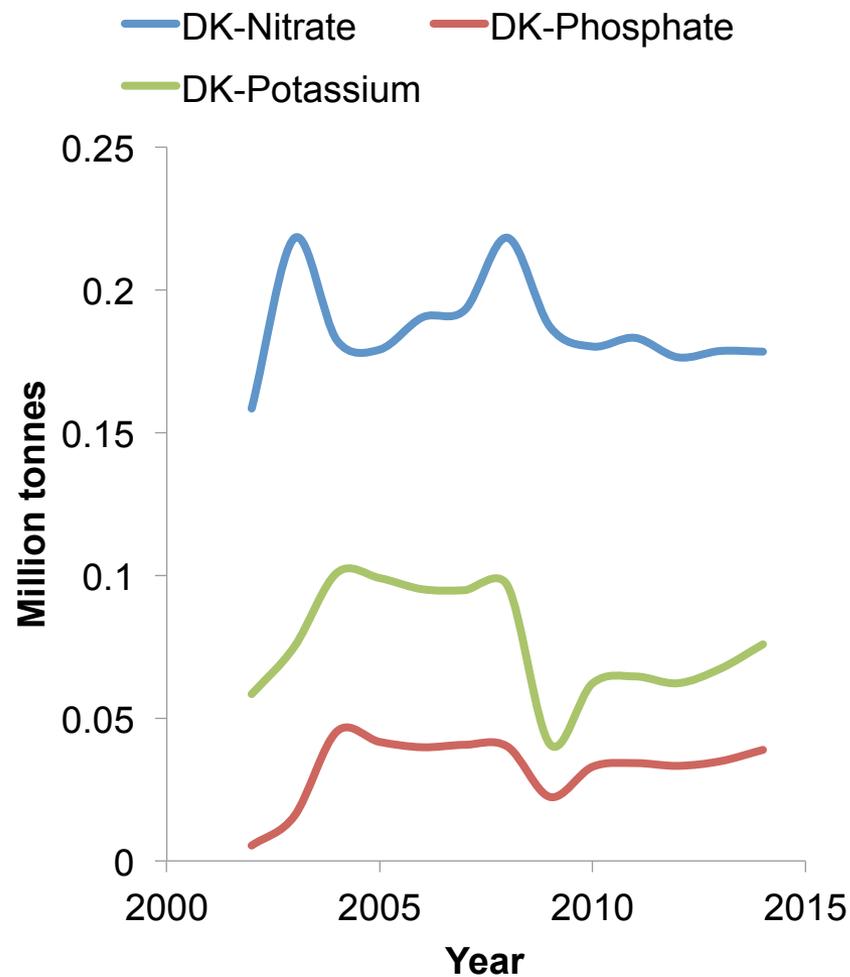
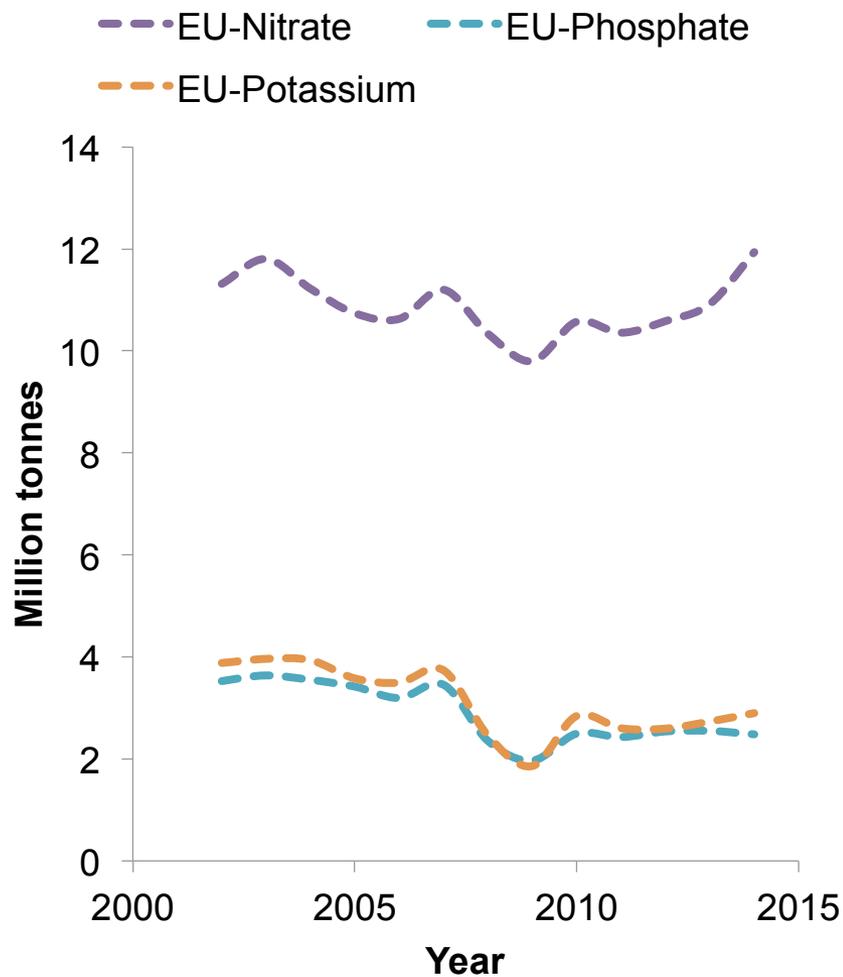
Changes in water quality variables during the last two decades



Water quality pressures: pesticide use in Denmark



Water quality pressures: fertiliser use

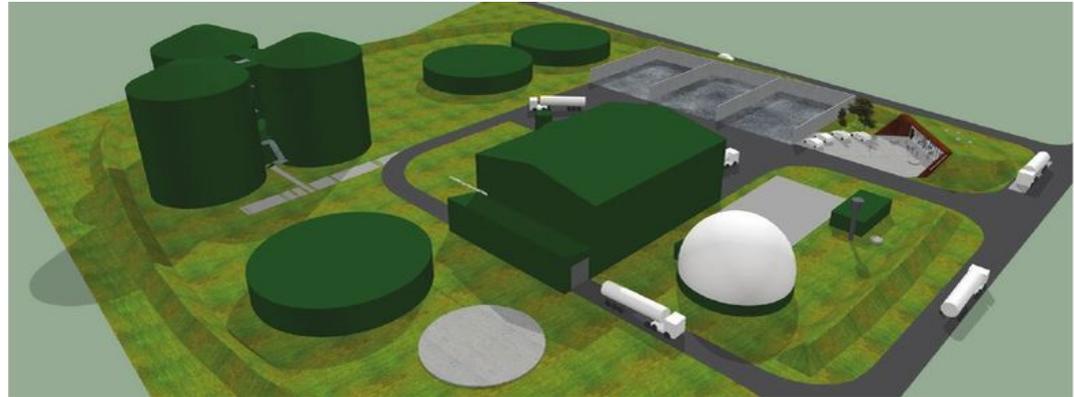


Organic farming with links to bioenergy

Organic biogas

- Why?

Fertilisers used on certified organic farms must be predominantly from organic livestock.



- What?

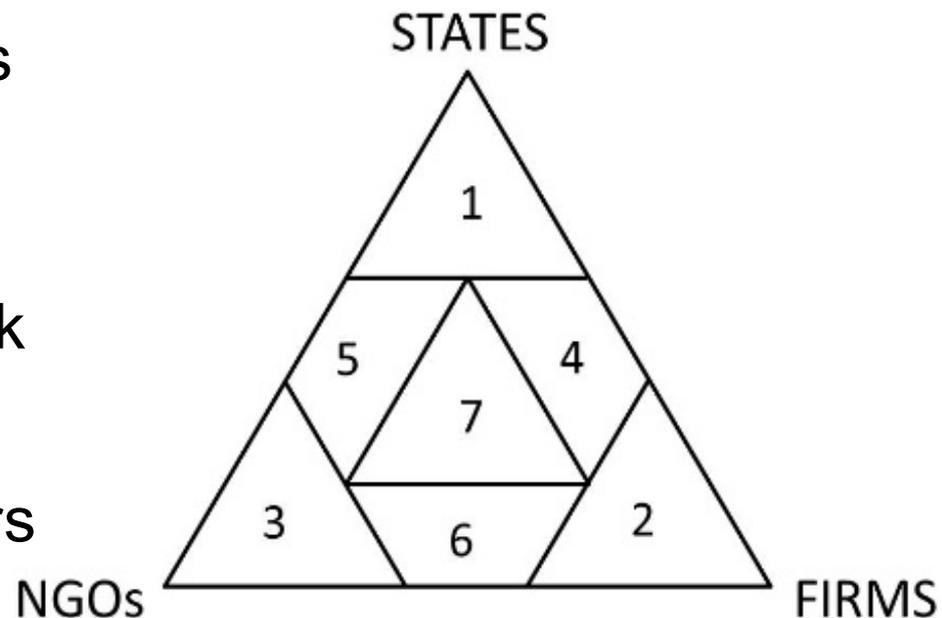
Nature Energy Månsson located in mid Jutland, the first (to my knowledge) certified organic biogas plant.

- How much?

- 150,000 tonnes livestock manure, vegetable waste and grass.
- 6 mio. m³ upgraded biogas (biomethane) to the natural gas grid.
- Expected start up in July 2017.
- Expected full production round year end 2017.

What's next

- Continue surveying governance mechanisms and applications
- Inclusion of IEA feedback
- Invitation to IEA members to contribute with examples of local/national (over)implementation of EU and other regulation



Thank you for your attention

Niclas Scott Bentsen, nb@ign.ku.dk

Inge Stupak, ism@ign.ku.dk