Energy Innovation in a Regional context

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Summer School 2010
Wednesday, 7 July: 11:00 – 12:00

- Content of this lecture:

1. My main argument on energy innovations
2. The Susten project and some Norwegian findings
3. CEDREN and the GOVREP project with references to Sweden
4. Why did Denmark succeed in promoting sustainable energy system innovation?
5. Summary

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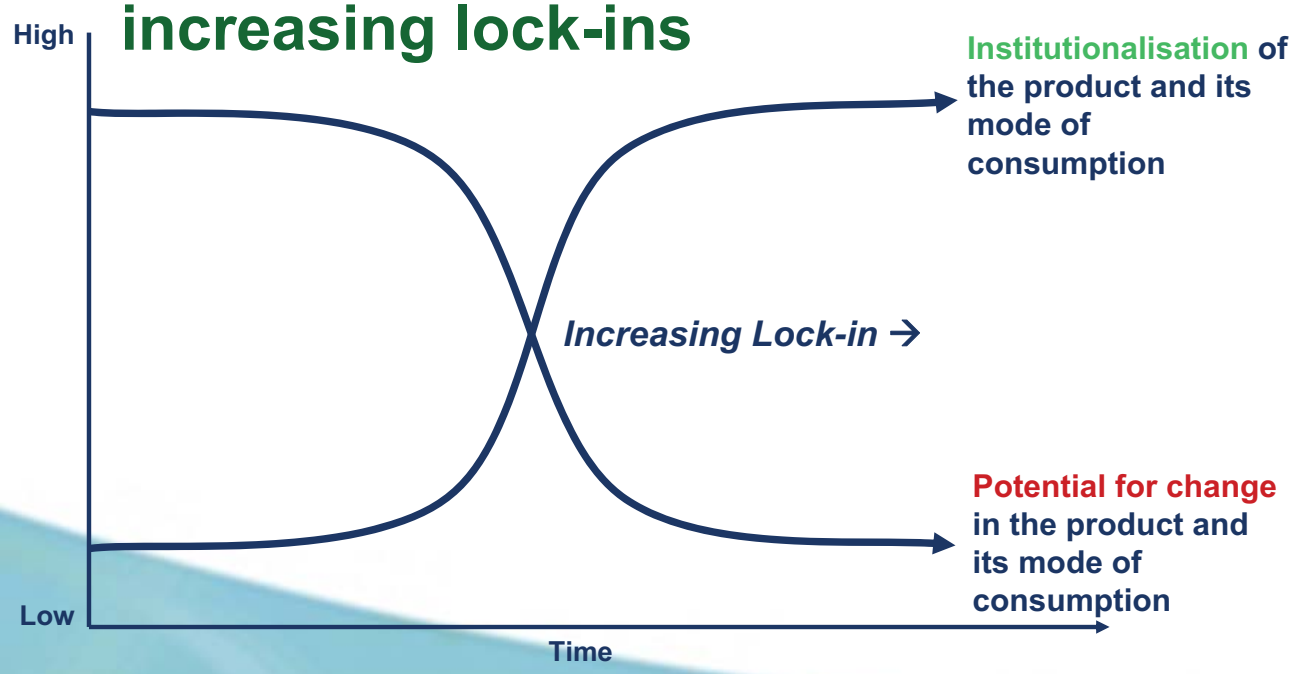
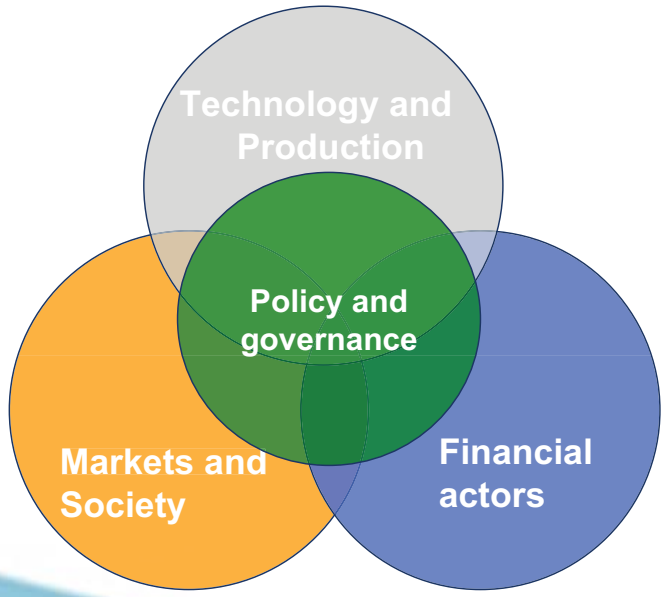
Sustainable Energy System Innovation: the challenge of increasing lock-ins

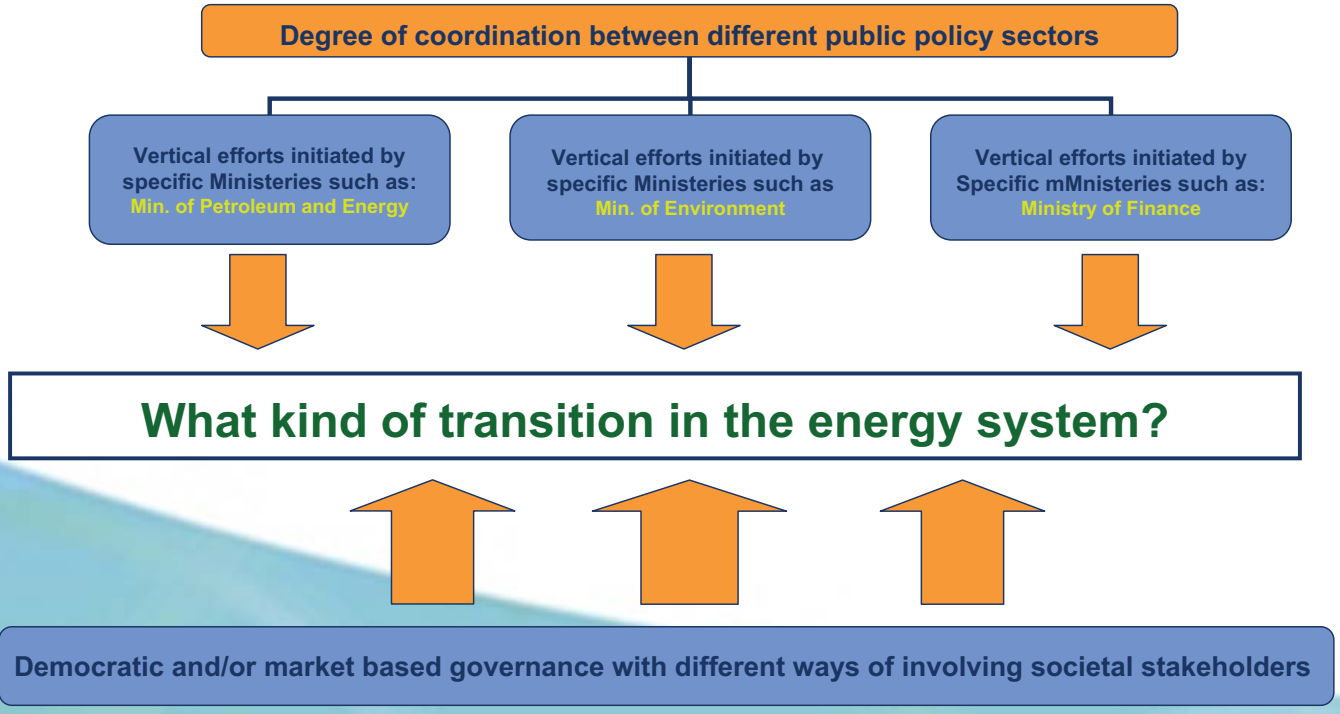


The importance of public policy coordination both horizontally and vertically

The major drivers influencing the energy system:



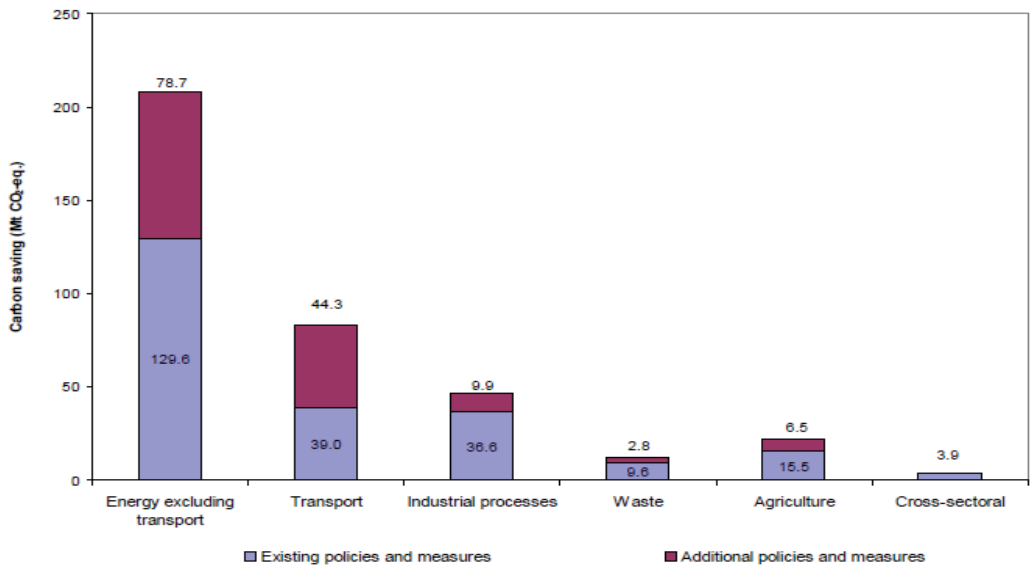
But how does the energy system actually function?



- Clarifying questions?

More than 80% of EU greenhouse gas emissions caused by production and use of energy

Figure 91 EU-15 Projected annual greenhouse gas emission savings by sector in 2010



Note: Projected savings from policies and measures in 2010 are estimated by comparison with a hypothetical reference case in which no measures were implemented since the base year.

Source: See Sources of Information (Chapter 7). Details on individual Member States can be found in Table 4 of the Country Profiles (Annex 8).

Source: EEA 2008

Where is the EU moving?

✓EU on track towards its common Kyoto commitment, by 2012.

✓EU is considered to be a global front-runner vis-à-vis further emission reduction targets for 2020 and beyond, but as far as energy is concerned:

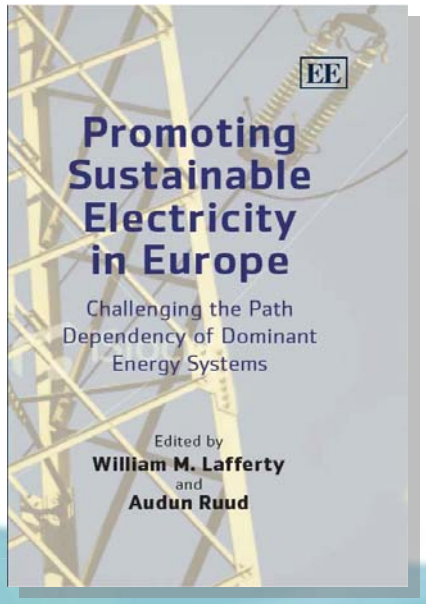
- ❑ The recently adopted EU Treaty (‘Lisbon’) has provided a formal basis for more common energy legislation, but no changes in the Member States’ control over the policy field.
- ❑ The EU will still be characterized by substantial differences of interests between Member States and geographical areas.
- ❑ Climate-change still to be considered in relation to security of supply and competitiveness. Unclear which concern(s) will prevail, and whether there will be further synergies.

✓The final impact from the EU energy policy depends, however, ultimately on the Member States’ follow-up. Thus, the actual results and eventual impacts of EU policy decisions are difficult to predict.

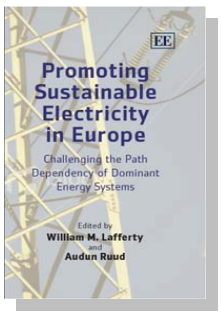
The SUSTEN Project

- Initiated by Programme for Research and Documentation for a Sustainable Society (ProSus), University of Oslo
- Financed primarily by the Research Council of Norway (RCN)
- In cooperation with seven major research institutions in Europe

- **FI: Finnish Environemt Institute (SYKE)**
- **SE: Stockholm Environment Institute (SEI)**
- **DK: Copenhagen Business School (CBS)**
- **NL: Centre for Clean Technology and Environmental Policy (CSTM), Utwente**
- **IE: Cleaner Production Promotion Unit (CPPU), Ucork**
- **AU: Technical University Graz (TUG)**
- **ES: Department of Political Science, (UAM), Madrid**



► Some Norwegian findings:



➢Only limited business interest in promoting renewable electricity (RES-E) – rather a cash cow for owners – in particular municipalities

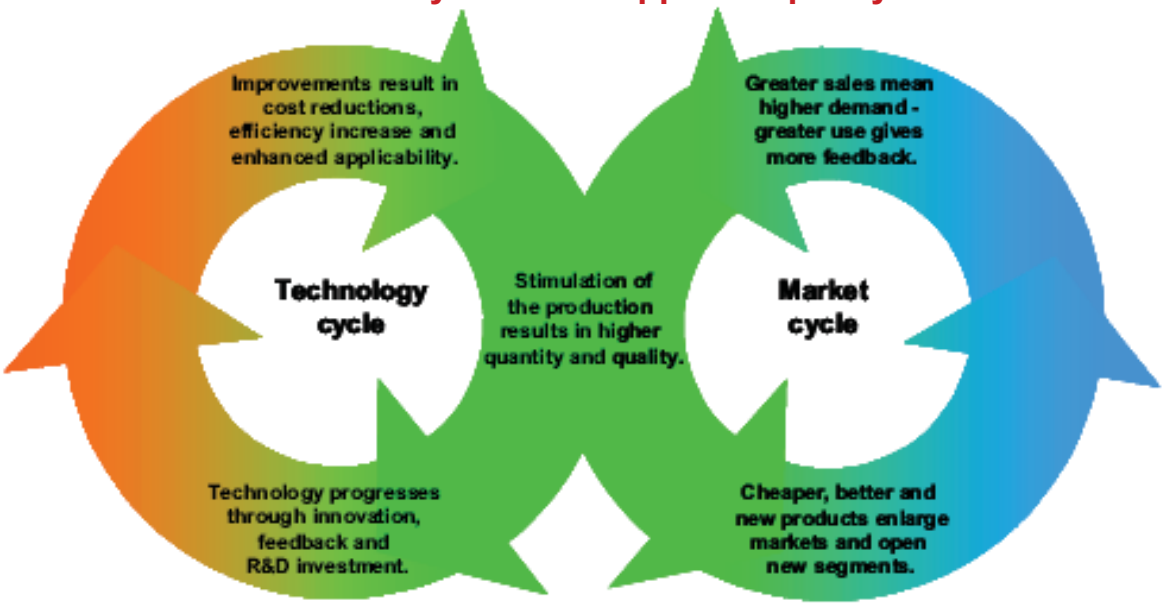
➢Norway has the resources, but lacks the political will

➢Consequently, only limited wind power! Norwegian investors are rather pursuing ventures abroad!

➢Given, the climate policy commitment, the energy policy focus is rather on CCS!

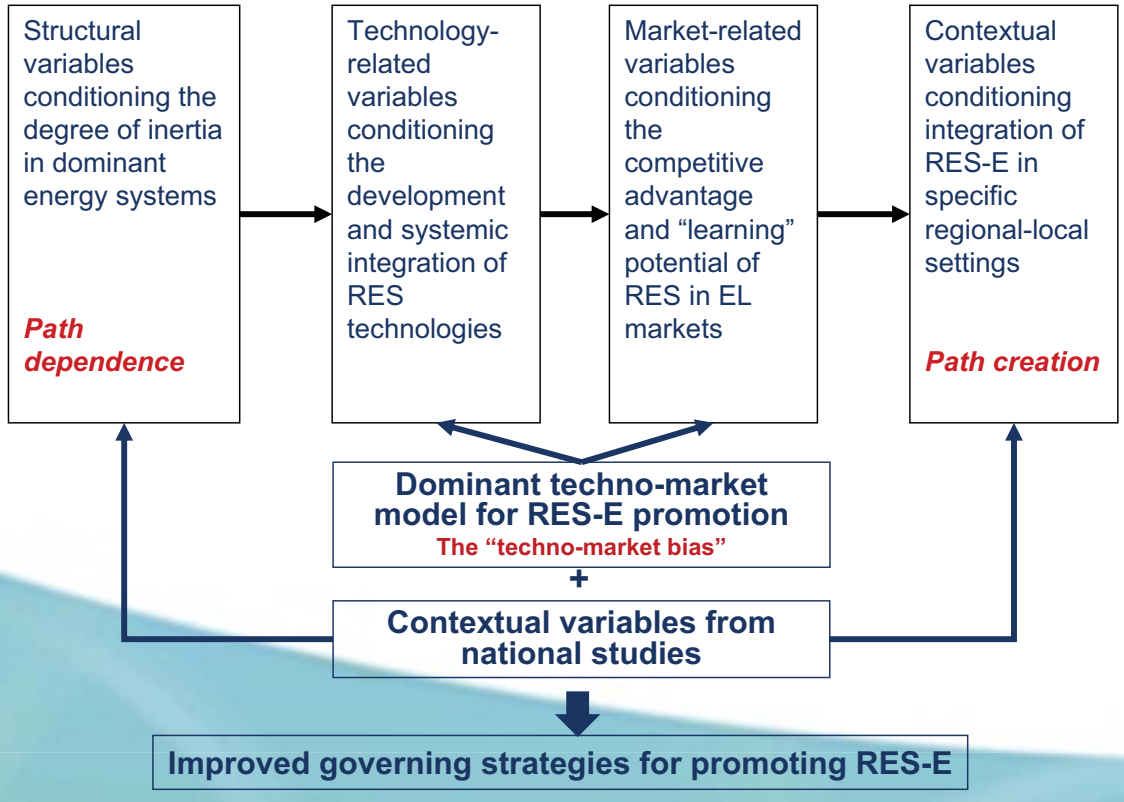
➢**WHY?**

Standard model of a "virtuous cycle for a supportive policy environment":



Source: *Renewables for Power Generation* (2003: IEA-OECD, p. 14)

The expanded "virtuous cycle" applied in SUSTEN:



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TU Graz
Graz University of Technology

Questions?

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Centre for environmental design of renewable energy – CEDREN

SINTEF NTNU NINA Norsk institutt for naturforskning

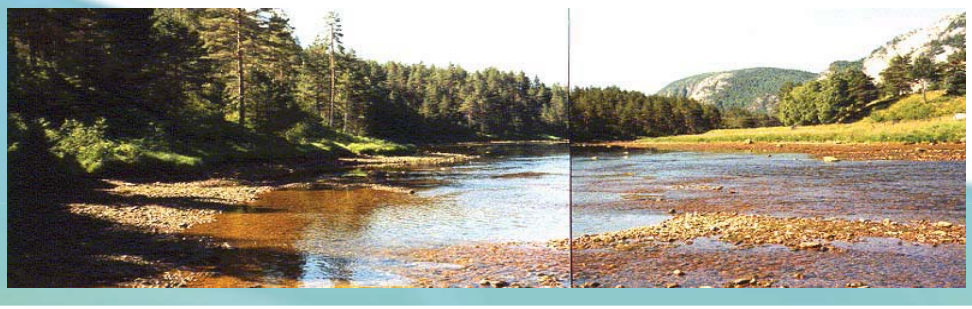
UNIFOB NIVA

The main objective of CEDREN is to develop and communicate design solutions for renewable energy production that address environmental and societal challenges at local, regional, national and global levels.

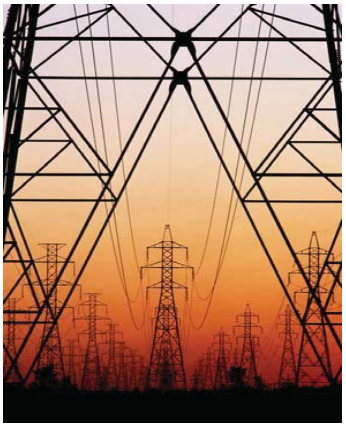
Technology development for the future hydro system

Hydropower development

Environmental impacts of flow fluctuations – methods and tools



Increased power *and* salmon production



Power transmission: Impacts on wildlife

Environmental design

Policy and society: How to reconcile energy and the environment?

Birds and wind turbines

GOVREP

GOVernance for Renewable Electricity Production



How to reconcile environmental- and energy policy concerns?

Enabling a more effective realization of both energy- and environmental objectives as agreed upon by the Parliament

More environmentally sound electricity production will be promoted due to:

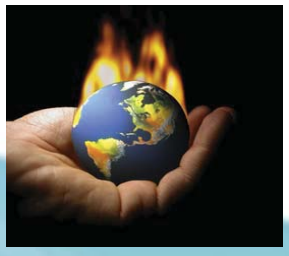
- National renewable electricity targets
- A proposed Green certificate market with Sweden from 2012
- Implementation of the EU directive on renewables (RES) from 2011:
  - The RES Directive aims at achieving 20 % RES of total net energy consumption in the EU by 2020, as well as 10 % for the transport sector.
  - Binding national targets. Sweden has 49%. *Norway's target not yet decided!*
  - National action plans to be published before 30 June 2010. Norway intends to follow this schedule.



and the environment must be protected

- Electricity from renewable sources will be promoted to combat climate change, but other environmental policy challenges are still prevailing

- The EU Water Framework Directive:
  - Requires a more coherent management of watercourses
  - Including new environmental quality standards that may influence revisions of hydro power concessions.



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- Need to identify appropriate and effective measures to reconcile environmental- and energy policy concerns!

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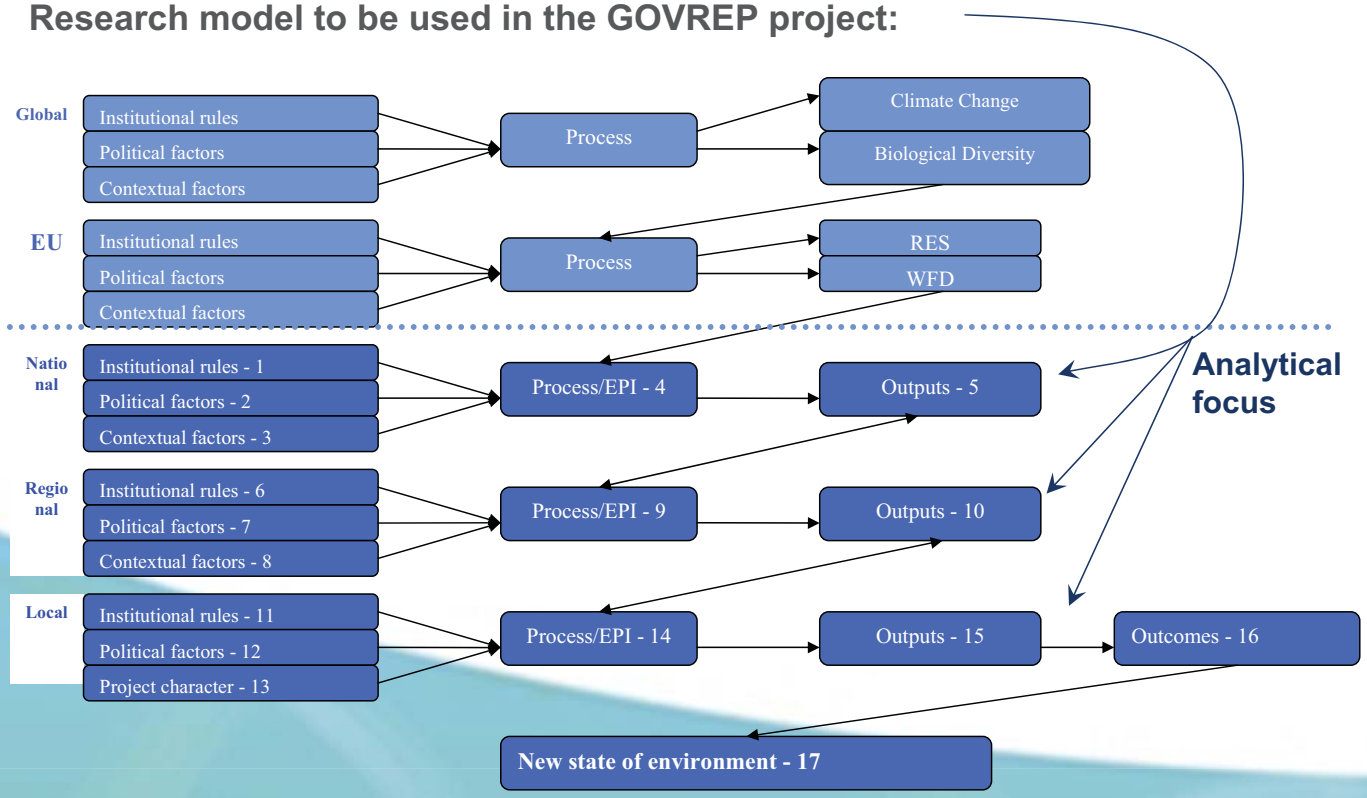
Research model to be used in the GOVREP project:

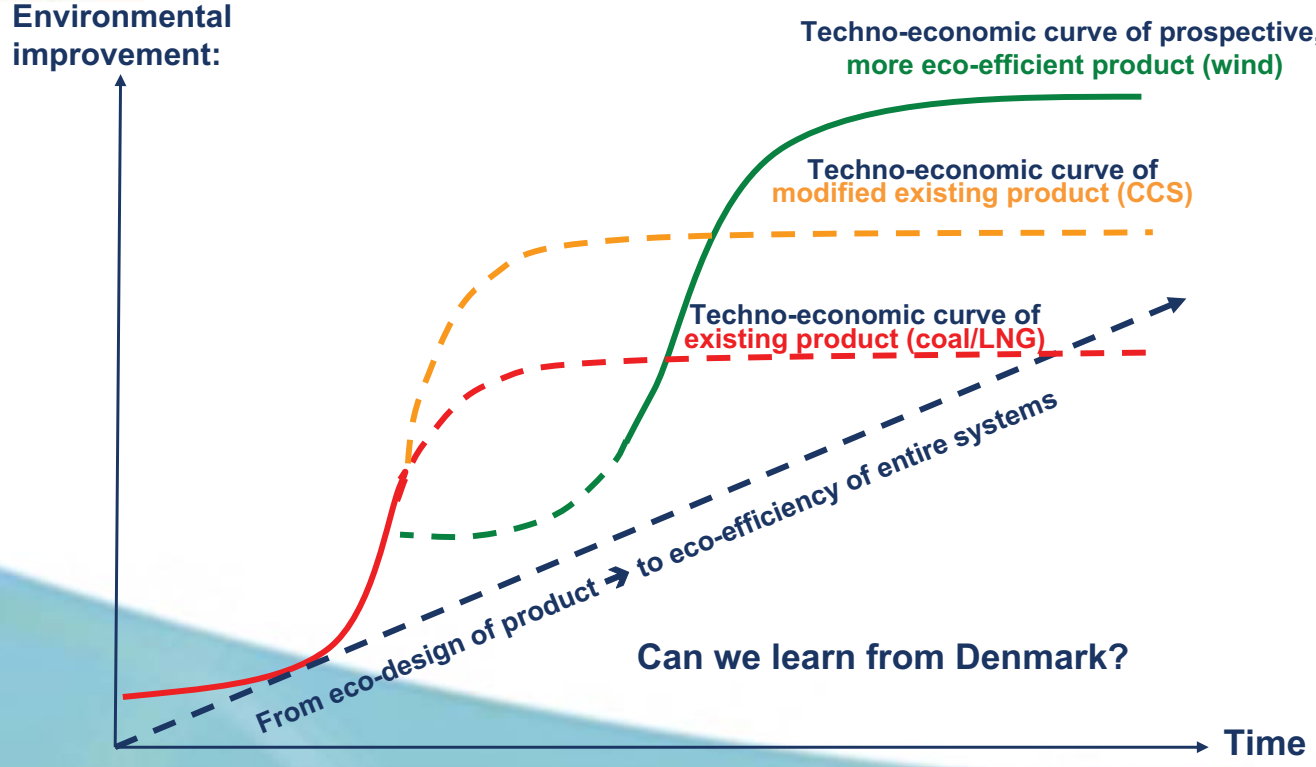


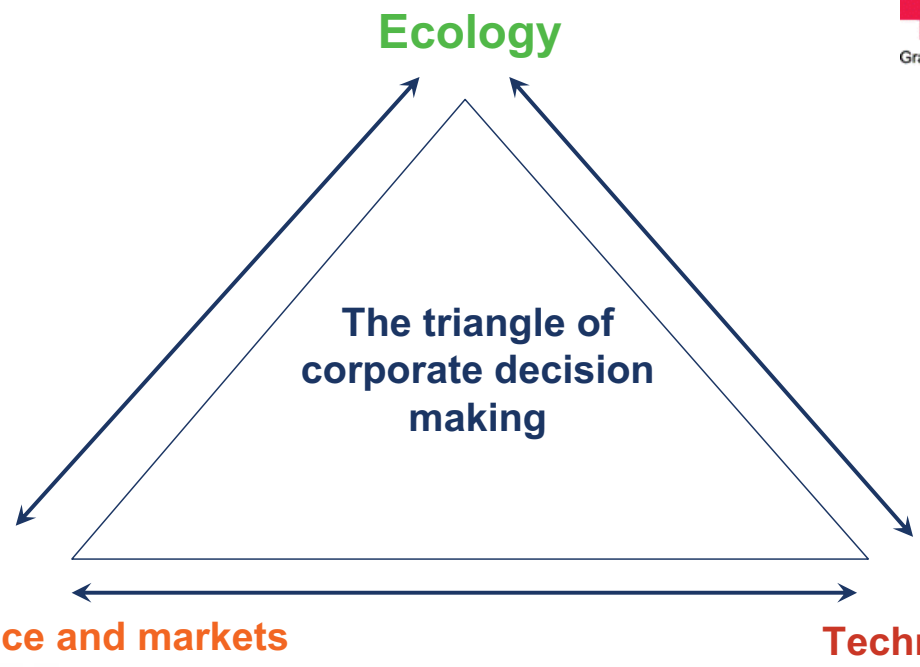
Energy- and climate achievements in Denmark

- Climate: Kyoto (-21%) challenging to fulfill due to emissions from transport sector
- But Europe's most energy efficient economy.
- Increasing shares on renewables – particularly wind,
- Policy measures relatively well adapted to local conditions.

- Why has Denmark succeeded in promoting sustainable energy system innovation?

How to realize eco-effective innovations?
The case of renewable electricity





The need to combine approaches while maintaining the dialogue with all interested parties: The challenge of communication!