
The emergence of a "global challenge" policy priority:
an analysis of Scandinavian countries'
S&T policy responses to climate change



Tentative Governance In Emerging Science and Technology
Actor Constellations, Institutional
Arrangements and Strategies

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- A 2008 project **eNERGIA Competitive policies in the Nordic Energy Research and Innovation Area**
- Funded by Nordic Energy Research and NIFU STEP
- Extensive information about Nordic and Baltic countries' energy sectors and energy policy systems
- Similar Scandinavian countries Sweden, Norway and Denmark (culture, societal values and institutional set up)
- After the oil crisis in 1973 the Scandinavian countries chose different energy pathways
- Dissimilar economic and industrial specialisation

■ Qualitative approaches:

- Desktop research
- Meetings and interviews with experts
- Case studies of good practice

■ Quantitative approaches:

- Bibliometric and Patent analysis
- Analysis of R&D project data (NER & EUFP)
- Energy Data (funding and production)
- Innovation system analysis

■ Recently added data

- Event history analysis
- Updated energy data

Questions

- What type of energy transition occurred in the three countries? (Norway, Sweden and Denmark)
- What made them successful (or not)?
- How do the transitions reflect differences in national energy policies?
- How can differences be explained and what can we learn from this?
- How can core concepts in transition management theory be used for understanding policy processes of handling climate change and energy transitions in the Scandinavian countries?

In the paper we discuss activities at three policy levels

- *the strategic level* (processes of vision development, strategic discussions, and long term goal formation)
- *the tactical level* (processes of agenda building, coalition building)
- *the operational level* (policy instruments, implementation through agencies)

Framework for policy integration, three types of policies

■ *Science policy:*

- sustainability assessments of system innovations, studies of past and ongoing transitions, focusing on the role of policy and usefulness of various governance models;

■ *Innovation policy:*

- the creation of innovation alliances, R&D programmes for sustainable technologies, the use of transition experiments, and alignments of innovation policies to transition goals;

■ *Sector policy:*

- niche policies (through procurement, regulation or the use of economic incentives), the removal of barriers to the development of system innovations, and formulation of long term goals and visions to give direction to research and innovation

What type of energy transition occurred in the three countries?

- Different development paths have taken place in the three Scandinavian countries' energy systems after the oil crisis
- Sweden today almost fossil-free, 50% of electricity production hydro power, remainder nuclear power
- Norway close to 100 % hydro power, oil and gas extraction dominates policy path
- Denmark coal/gas extensively used but good results in wind energy, strong focus on efficiency and el. grid

How do the transitions reflect differences in national energy policies?

■ Denmark:

- Started as farm based entrepreneurial activities in wind energy supported by policy instruments
- Governmental focus on renewable energy resources, environment and sustainability
- Concrete goals for high shares of renewable energy production, resulting in increased funding of research, but also energy efficiency and energy saving
- Tradition for strategic planning:
 - Energiplan Energi 21 (1996)
 - Energy strategy 2025 (2005)
- REFU Advisory Body - important policy driver on energy research: Strategy for energy research, development and demonstration (2006)
- 2010: Active vision of fossil free society

How do the transitions reflect differences in national energy policies?

■ Sweden:

- Public funded energy related research started after the first oil crisis
- Dominated by nuclear and hydropower, during the 1980s growing pressure for phasing out nuclear power production: strong driving force behind energy research
- 1997: Parliament decides to phase out nuclear power: Long term energy policy programme (1998-2004)
- 2005: The commission on oil independence is appointed by the government (“Making Sweden an oil free society”)
- Current government: “Climate Billion” (2008-2010)
- Backlash 2010: Nuclear power is back again.

How do the transitions reflect differences in national energy policies?

■ Norway:

- Policy context dominated by hydropower and oil and gas interests
- Policy strategy and explosion in public funding show will to emphasise renewable energy
 - Klimaforliket (Parliamentary agreement)
 - Energi 21 (R&D strategy)
- Path dependency, sufficient industrial/bureaucratic resources for new renewable energy?
- Paradoxes?
 - Surprising lack of efficient policy instruments for deployment of new renewable energy production
 - NIMBY-effect and environmental NGOs
 - Still promising and partly strong industrial activities (CCS, solar, wave, wind) oriented towards a global / European market

How can differences be explained and what can we learn from this?

- Example: Lock-in in energy policy systems
- Is priority of renewable energy in policy and research easier in situations with more dedicated policy actors?
- Look at the organisation of energy policy together with the allocation of research funding
- Hypothesis: the Norwegian Ministry of petroleum and energy is paying less attention to renewable energy than to oil and gas

What made them successful (or not)?

- Renewable energy policy visions show(ed) the way
- Policy governance and coordination
 - Political consensus, environmental concerns in energy policy
- Organisation of energy policy and energy R&D
 - The role of specialised energy authorities
- Unity is strength: Alignment of energy policy, industry interests and civil society

- Strategic planning approach
- Knowledge, strategic planning and communication/interaction
- Challenges and opportunities with the rapid market growth for renewables

Operational level: Energy policy instruments

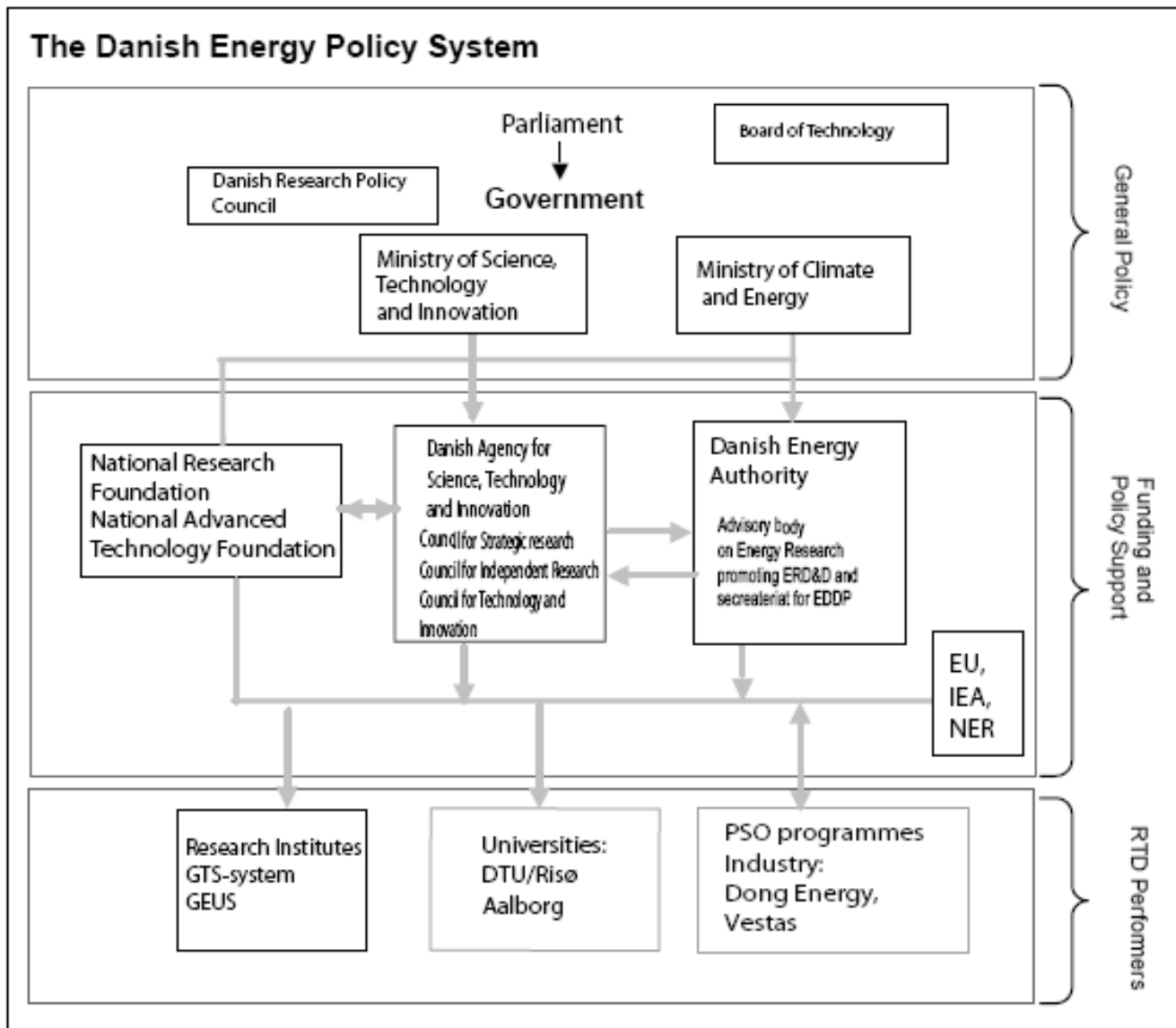
- Legislation, planning and incentive mechanisms
- Important incentive mechanisms
- Importance of not over-subsidising mature renewable energy technologies
- Stable long-term funding and coordination of R&D
- Costs of demonstration plants and scaling-up, need for funding and venture capital

Conclusions

- Long-term horizon and dedication of central actors
- A policy system, an R&D system and industrial actors who share views and beliefs about future options and scenarios
- A reasonably strong degree of policy integration between science, innovation and sector policies
- However lock-in patterns that seem to be difficult to get out of
- At the strategic level national policy makers have adopted the paramount goals of climate change
- Are the three countries able to reinforce the four decades of transition towards sustainable development as a response to the climate change driven policy attention?

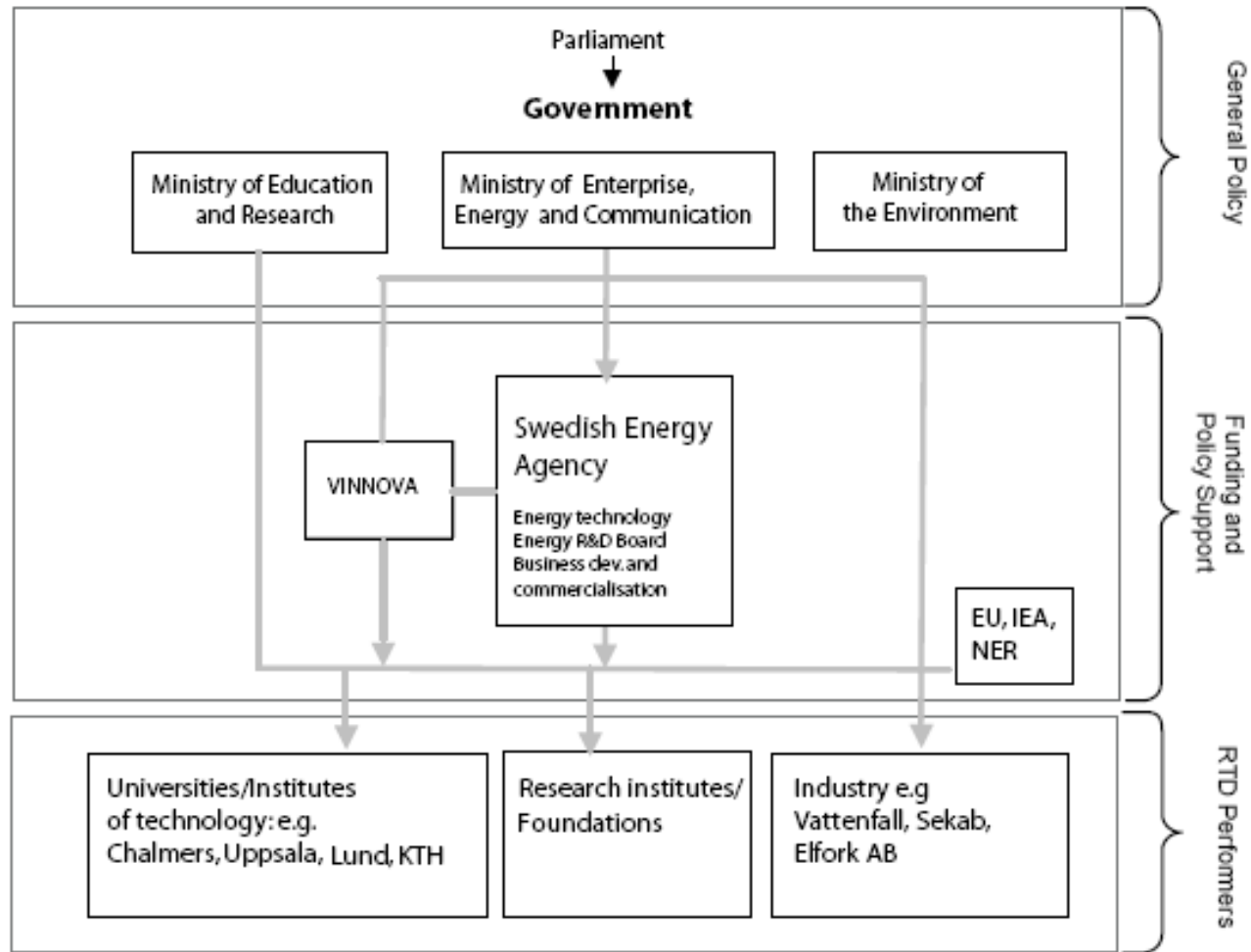
Thank you for your attention!

The Danish Energy Policy System



The Swedish Energy Policy System

The Swedish Energy Policy System



The Norwegian Energy Policy System

