

Public policy as a part of transforming energy systems:

Framing bioenergy in Finnish energy policy
from the 1970s to 2009

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Background of the paper

- Energy systems characterised by path dependence
 - Important to find mechanisms inducing change
- Government interventions an important factor for energy systems change
 - May facilitate innovation & transitions (e.g. Rotmans et al. 2001, Unruh 2000)
 - But once established often characterised by stability and persistence, even lock-in (e.g. Hargadon & Douglas 2001, Unruh 2000).

Contents of strategies are important

- They contain promises of policymakers to a wide group of stakeholders
- Successes in creating new energy policy paths may lead to new established regulatory systems
- Government strategies influence the meanings attributed to technology (Klein & Kleinmann 2002, Jorgensen et al. 2009) and choices undertaken by stakeholders
 - When tying technological artifacts to policy goals and problems
 - E.g. environmental attributes

Purpose

- to study how strategies frame and describe technological options
- to examine the evolution of the "winning" technological frame over time
- to focus on bioenergy, because of long-standing policy support

Research questions

- How have bioenergy options been framed in Finnish policy strategies and how has the framing changed over time?
- How has bioenergy framing in strategies contributed to the transformation of Finnish bioenergy systems?
- Can a deeper understanding of change and stability in policy framing improve our knowledge of the dynamics of technologies and socio-technical systems?

Framing as the key concept

- Framing a key concept in social science
 - how issues are framed determine what should be done
 - define problems, diagnose causes, make moral interpretations and suggest action (Entman 1993)
 - E.g. changes in framing Swedish energy policy (Nilsson 2005)
- Framing as a contributor to social shaping of technological paths (e.g. Klein & Kleinmann 2002, Jorgensen et al. 2009)
 - Describing favoured technological solutions or system components
 - Framing the context for described technology
- Framing of bioenergy paths
 - General or specific
 - Sub-systems, resources, technology, users
 - Justifications, goals

Methods

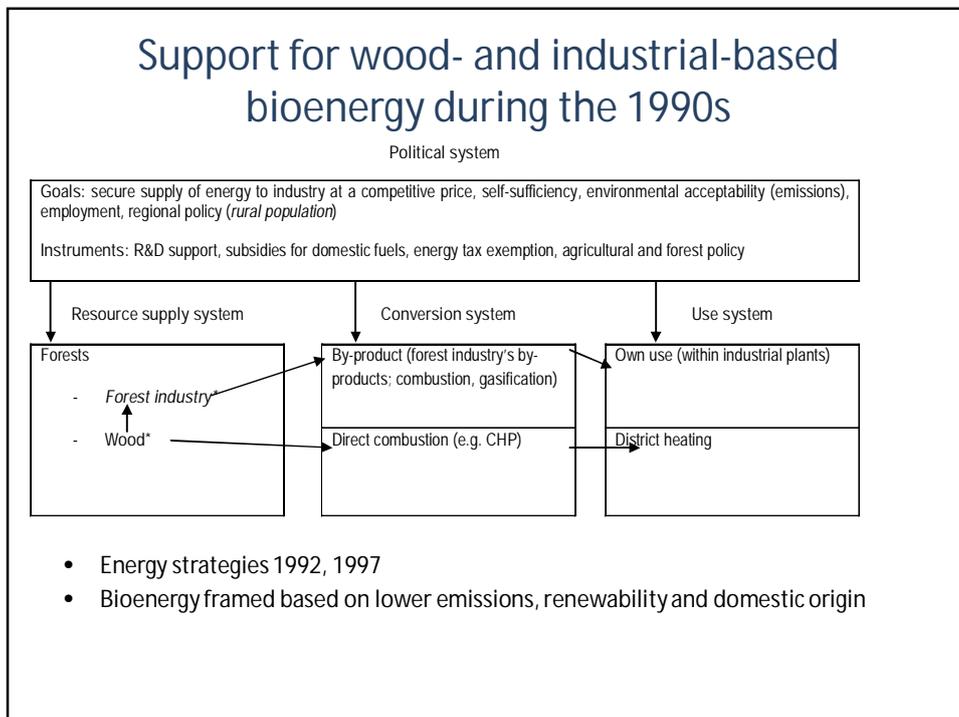
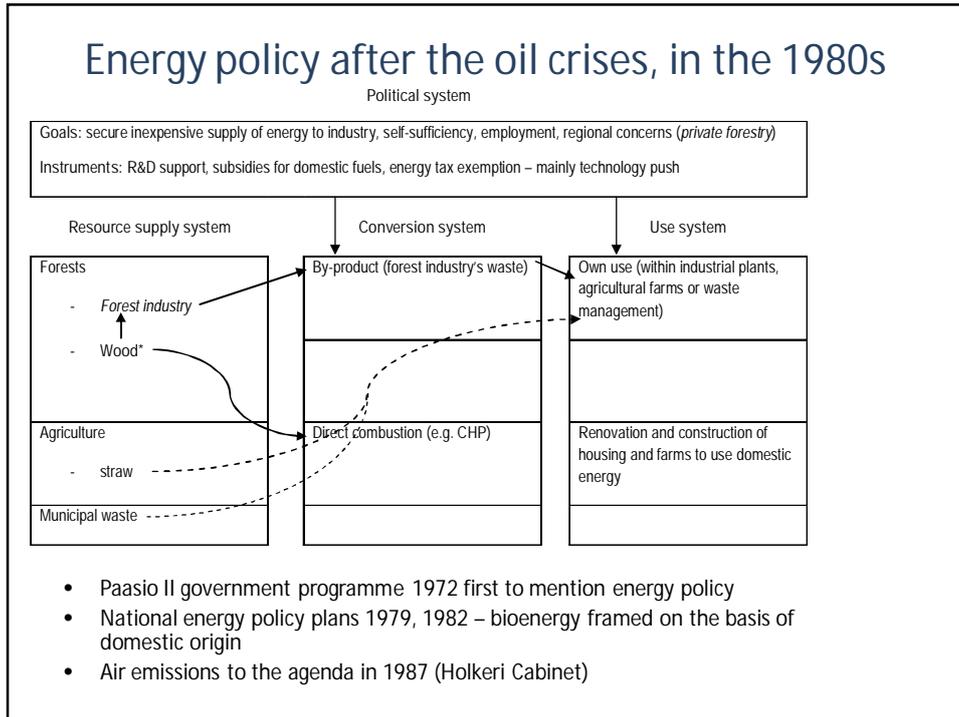
- Empirical material:
 - 15 government programs (1972 – 2007),
 - 4 national energy strategies (1979, 1982, 1992, 1997), a climate strategy (2001), 2 climate and energy strategies (2005, 2008) and a foresight report on climate and energy policy (2009)
- Spreadsheet coding examining on a general level and in relation to bioenergy
 - objectives, mechanisms, reasoning, actors
 - references to other policy domains
 - references to bioenergy fuel supply, conversion and use
- Combined with previous studies on bioenergy policy and innovation

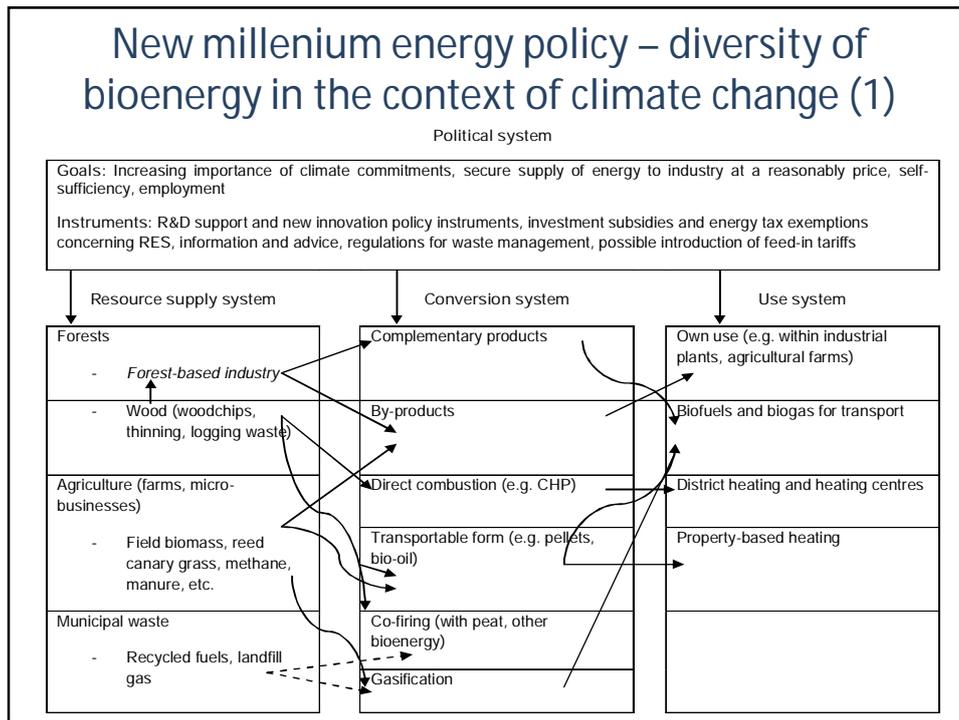
Analytical framework: elements in framing examined

Political system (expanded from Kern & Howlett 2009)

Goals: Old, reframed and/or new
 Instruments: Old, reframed and/or new

Resource supply system	Conversion system	Use system
Forests	By-products	Own use (e.g. within industrial plants, agricultural farms)
Agriculture	Combustion / gasification	Electricity
Waste	Processing into transportable form	Heating
Imports	Complementary-product	Transport





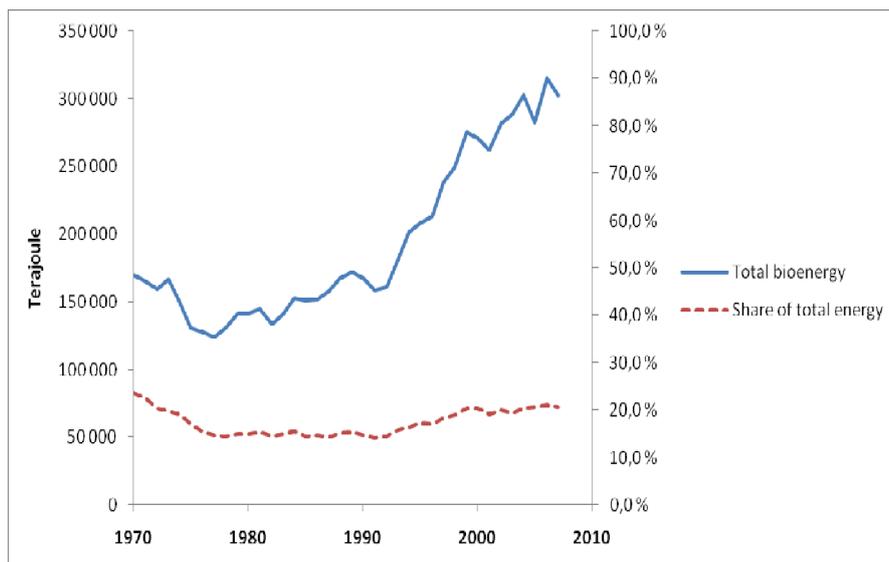
New millenium energy policy – diversity of bioenergy in the context of climate change (2)

- **Action Plan for Renewable Energy (1999)**
 - began an era, when new bioenergy paths were extensively outlined
- **First, most attention on waste-based energy**
 - Action Plan 1999, Climate Strategy 2001, Vanhanen Cabinet 2003
- **Later, focus shifted on agriculture-based energy**
 - Climate & Energy Strategy 2005, Vanhanen II Cabinet 2007, Climate & Energy Strategy 2008
- **Vanhanen II government programme in 2007 raised climate goals on the top of energy policy agenda**

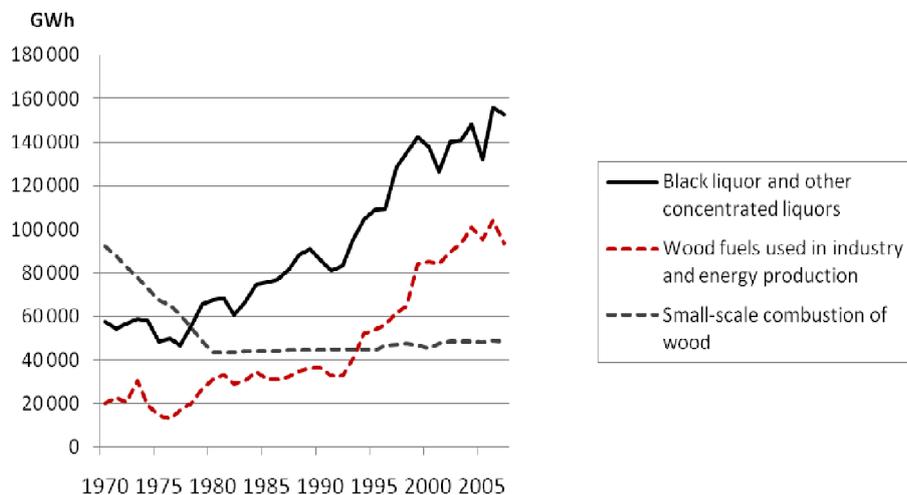
Persistence of dominant arguments & some reframing

- Security of supply, self-sufficiency and low-price have stayed as main goals of energy policy for 30 years
 - Minor reframing when air emissions brought to agenda
 - Major reframing in late 2000s when climate goals lifted on top of the list of energy policy goals, influenced by EU policies
- Wood-based energy as the dominant bioenergy design until turn of millenium
 - E.g. air emissions did not influence this in the 1990s
- Bioenergy was long framed mostly in terms of resource and fuel supply
 - Alternative framings involving all the three sub-systems appeared during the last decade
 - Change from regional and economic based to climate based framing

Link between framing & actual development (1)



Link between framing & actual development (2)



Link between framing & actual development (3)

- Non-climate, qualitative role of strategies
 - Agriculture-based bioenergy given a large role in recent strategies despite limited potential in all future scenarios (e.g. foresight report 2009)
- Incongruous policy strategies and instrument development
 - E.g. revisions in tax structure, SHOKs, feed-in tariffs
 - Because financial commitments tied with the budgeting, not the strategy, processes
- Layering of policy goals and instruments
 - Similar to Dutch energy policy (Kern & Howlett 2009)

Policy framing and socio-technical systems

- Transition to a low-carbon energy system demands a reframing of energy policy (Scrase and Ockwell, 2010), yet climate change has often been framed as a problem solved by existing technologies and practices (Lovell et al., 2009).
- Finnish case: new competing technological frames to policy agenda while, simultaneously, the framing of climate change used to support incumbent technological paths (reframing meanings and justifications).
- Framing of bioenergy changed from energy security based to climate-based → strategies as intermediary (Callon 1991) in the socio-technical system
- Destabilisation of the dominant bioenergy path by multiplying the no. of bioenergy options
- Climate justifications of bioenergy tightly bound with other policy goals (rural, industrial)

Conclusions

- Construction of alternative bioenergy paths limited until turn of the millenium
 - Despite air pollution issues & liberalisation of electricity markets
- Era of ferment during the last decade
 - New competing technological frames
 - Climate policy an important goal
 - From resource-based view to policy covering all sub-systems (resource, conversion, use)
- A reframing of goals does not necessarily lead to a construction of new technological paths
 - A major reframing may initiate an era of ferment and bring in competing technological frames