Clench

ClimPol

Cluster D: Climate policies, firm strategies and technological innovation

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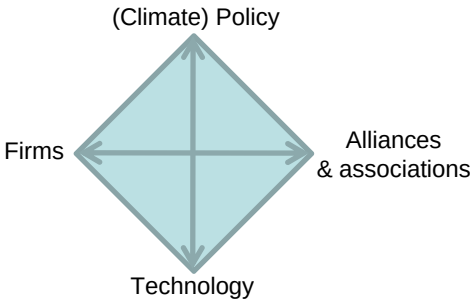
http://www.cces.ethz.ch/projects/clench/CLIMPOL

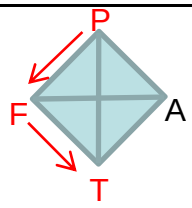
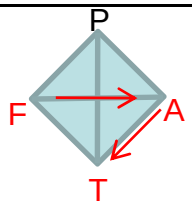
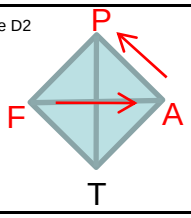


In order to cope with the challenges of climate change, fundamental changes are needed in established systems of service provision and consumption. A key rationale for climate policy making is that it induces firms and other actors to develop new 'climate-friendly' technologies.

The goal of this project was to study the strategies of firms, inter-firm alliances and associations in the tension field of climate policies and innovative technologies. Each of the three modules focused on a selected set of the relations depicted in the diamond. Empirical analyses were carried out in the fields of energy supply and transportation.

Our results show that existing climate policies do not necessarily trigger technological innovation. In order to be effective, climate policies have to be stringent and must be embedded in long-term visions and political goals (D1). The policy challenges might be even more pronounced if radical innovations (e.g. decentralized energy technologies) shall be stimulated. For fundamentally new technologies to develop and succeed, firms from different sectors have to come together and work towards common goals. Such networking as well as knowledge creation in the field have to be supported by a variety of policies – some rather generic, some more technology-specific (D3). Climate policies, in other words, have to be complemented by sector- and technology-specific stimuli for innovation.

While in the case of emerging technological fields, the effects of networking and alliance-building may be desirable for system changes, we observe the adverse effect in established sectors such as the car industry. Lobby networks and associations in established industries typically counteract effective climate policy making in order to protect existing products and market shares (D2). As a matter of fact, policy making has to tackle different fields in different ways in order to achieve the goal of fundamentally transforming existing systems towards more sustainable modes of production and consumption.

	Module D1 	Module D3 	Module D2 
Specific question	How does international market based climate-policy affect corporate innovation activities?	How do innovating firms shape an emerging technological field?	How do firms influence climate policy making?
Theoretical inroad(s)	Conceptual cross-over of different literatures: innovation systems, resource-based view, environmental economics	Conceptual cross-over of different literatures: innovation systems, resource-based view, institutional entrepreneurship	Assumptions based on rational choice theory, interest group theory, collective action theory, institutional entrepreneurship
Method	1. >50 Exploratory interviews 2. 19 Case studies in Germany for theory development 3. Survey in 7 EU countries (200 firms) for theory testing	- Exploratory analyses for theory development - Case study analysis & comparison based on interviews, firm reports, newspaper articles	- Expert interviews - Content analysis - Cluster analysis - Social network analysis
Case	Analysis of the European electricity sector: a) Power generators b) Technology providers c) Project developers	Five formal networks (alliances) in the innovation system of stationary fuel cells in Germany. (These fuel cells can be installed in buildings for an efficient co-generation of heat and power.)	Analysis of the Swiss CO_2 law: a) positions of firms and business associations b) voluntary agreement of Swiss car importers
Results	- Innovation effect of current climate-policy (EU emission trading and clean development mechanism) so far limited - Long-term reduction targets (2050 vision) and other policies (renewable energy support) trigger innovation - Context factors (such as public acceptance or fuel prices) and firm characteristics (such as existing technology portfolio) very influential	- Firms (and other actors) strategically cooperate in formal networks to create & shape collective resources. - Examples of such resources are R&D support programs, technological standards, common expectations, or the reputation of the new technology. - Collective resources may generate positive effects for many actors and are thus crucial for the development of the technological field.	- Pluralism: various positions of firms on climate policy - asymmetric representation of firms' interests: • peak business associations are very well represented in political decision making, enforced by social networks • peak business associations tend to overestimate costs of climate policy
Recommendations	- Enhancement of stringency and predictability necessary - Political long-term visions have to be formulated to provide orientation for firms - Complementation of climate-policy with smart innovation policy mix - Technologies in niches need to be specifically supported → see Module D3 (next column)	Technology and innovation policy should - Track and enhance the development and the supportive effects of collective resources. - Support inter-firm alliances and collective action in the technological innovation system. - Support the creation of value chains. ➢However: Networks of established actors may also counter-act sustainable innovation & technological change → see Module D2 (next column)	- Information: • enhance dialogue between private and public stakeholders and science; and political decision makers and science • expert groups from science as policy consultants - Transparency in political decision making and administrative processes