T14P02 / Designing Sticky Policies: How to Steer the Co-evolution of Policy and Technology

Topic : T14 / Science, Internet and Technology Policy

Chair : Tobias Schmidt (ETH Zurich)

Second Chair : Benjamin Cashore (National University of Singapore)

Third Chair : Sebastian Sewerin (Delft University of Technology)

GENERAL OBJECTIVES, RESEARCH QUESTIONS AND SCIENTIFIC RELEVANCE

Not only does technological change play an ever growing role in our daily lives (e.g., through the introduction of new information and communications technologies (ICTs)), but it also is considered a key lever in tackling super-wicked problems, such as climate change. However, technological change is presently not considered systematically in public policy research. While research on the policy designs' effect on technological change is abundant – for example in the field of renewable energy policy, many studies investigate the effect of policy instruments on the development and deployment of low-carbon technologies – the inverse effect of how technological change affects policy-making remains largely unexplored. Only some isolated studies have explicitly analyzed the role of technological change in policy dynamics: Auld/Cashore et al. (1) discussed how technological innovation can improve the general performance and tracking mechanisms of forestry certification programs; Jacobsson/Lauber (2) analyzed the politics of the German energy system transition, touching upon the effects of technological innovation on advocacy coalitions in German energy politics; and Hoppmann et al. (3) showed how technological innovation in the German photovoltaics industry induced compulsive sequences of policy reform.

Despite these efforts, the majority of current public policy research neither treats technological change in a systematic way nor considers peculiarities of different technologies (such as distinct innovation patterns), making it difficult to hypothesize about the feedback link between technological change and policy dynamics. This gap is particularly troubling for the emerging 'new' policy design literature that stresses the need to consider the temporal aspects of design, e.g., by designing 'sticky' or 'durable' policies that intentionally generate positive policy feedbacks. Furthermore, a better understanding of the feedback link between technology and policy dynamics is particularly crucial in policy fields characterized by high technological complexity and long time spans for change, such as in the energy sector. Here, researchers have shown that policy designs that do not consider peculiarities of different technologies risk being ineffective and thus fail to induce positive feedback. Much less is known, however, about the effect of policy-induced technological change on actor constellations and the underlying politics of policy-making. Another aspect of the technology-policy feedback link rarely studied is how technology helps in assessing a policy's effectiveness in achieving its intended impact (e.g., smart metering and final energy consumption or remote sensing and land-use changes).

This panel discusses how to foster the systematic endogenization of technological change in policy research, particularly in policy design studies. It aims to bring together perspectives and insights from innovation studies and policy analysis. Participants are encouraged to include conceptualizations of technological change, to consider policy mixes instead of individual policies and to be precise about the dimension of policy output studied. The panel is open to both conceptual papers that aim to integrate technology into policy design studies as well as empirical studies of the feedback link between technological change and policy dynamics in fields relevant to the environment, e.g. renewable energy, forestry and land-use change.

References:

(1) Business and Politics 12(3)
(2) Energy Policy 34(3): 256-76
(3) Research Policy 43(8): 1422-41.

CALL FOR PAPERS

The panel invites papers relating to four topics concerning the design of sticky policies to steer the co-evolution of policy and technology:

1) Policy interventions can nurture new technologies, leading to the creation of new actor networks that in

turn influence long-term policy dynamics. Our understanding of the policy designs that are most effective in creating new actors is limited. We invite papers that systematically compare policy designs and their impact on the creation of low-carbon actor networks that fundamentally alter policy dynamics.

2) Political institutions moderate the speed, direction and stickiness of policy interventions. The moderating effect of institutions on policy dynamics is mostly analyzed in isolation, with systematic cross-country comparisons missing. We invite papers that analyze the effect of institutions on the technology-policy feedback link in order to improve policy design for different institutional contexts (such as uni-/bicameral legislations and federalism).

3) Technology differences can also affect the technology-policy feedback link: technologies differ in their disruptive potential as well as their learning rates, which in turn will entail different speeds of policy adjustment. Also, different technologies allow different shares of the supply chains to be localized. While these differences are widely recognized, systematic research to explain them is missing, leaving open the long-term effects of technology selection on policy dynamics. We invite papers that investigate how policies that are sensitive to technology differences can be designed.

4) While policy diffusion is well-studied, technology spillovers and their effect on policy dynamics are rarely studied. Policy-induced technological change as a driver of policy change in other jurisdictions is not analyzed systematically, nor is how technological innovation external to a policy field affects policy implementation and monitoring (e.g., remote sensing and forestry).We invite empirical and conceptual papers that aim at designing future policy interventions that are more adaptive to technological innovation.

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Session 1

Wednesday, June 28th 16:15 to 18:15 (Block B 3 - 7)

Discussants

Tobias Schmidt (ETH Zurich)

Sebastian Sewerin (Delft University of Technology)

A Theoretical Framework for Systematic Analyses of Policy Feedback

Philipp Pechmann (Department of Political Science, Aarhus University)

In this paper, I develop a theoretical framework for systematic analyses of policy feedback. The framework focuses on the strategic action of political actors and their attempts to design - within given constraints - policy feedback effects, i.e. the effects of policies on the political dynamics and politics and, hence, the future policy development in a given policy field.

The policy feedback literature typically views these kinds of effects as unintended and unanticipated by political actors. The assumption is that effects of policies on, for example, group formation and mobilization or on political norms and beliefs, unfold over time and that they can render policies path-dependent and "sticky", but that constraints such as information scarcity, time constraints, or the need to delegate, render it almost impossible for actors to anticipate or strategically design them. Since the idea of an intentional design of policy feedback is rejected, the literature fails to explore if and how political actors can strategically attempt to craft such feedback effects, and how these attempts – be they successful or not in the future - influence policy formulation in the present.

The literature on policy design, on the other side, focuses on strategic policy formulation, but examines mainly how policy goals can be given effect through the knowledge-based selection of means and instruments to achieve desired substantive public policy outcomes. Hence, while this literature emphasizes intentional, deliberate forms of policy formulation, it does not focus on the above mentioned kinds of feedback effects on the politics in a policy field and on potential strategic, deliberate design attempts behind them.

Problematizing the two literatures in this way, I develop a novel theoretical framework for the systematic analysis of policy feedback that views policy reforms as acts of political architecture. Political architecture means the strategic design of policies by actors considering the implications and effects of a policy on future politics and, hence, policy development. In particular, I conceptualize architectural policy design strategies that suggest affinities between three interrelated elements in policy-making: first, contextual factors that shape and frame policy-making (e.g. veto barriers, institutional discretion); second, policy instruments or tools actors can choose (e.g. compartmentalizing resource flows, enhancing or delimiting bureaucratic capacities); and, third, intended, or anticipated, feedback effects (e.g. group formation or mobilization). I illustrate these affinities drawing on a variety of recent empirical studies from different policy fields.

The framework combines insights from literatures on public policy, policy feedback, historical institutionalism, policy change, and agency/strategic action in novel ways. Its contribution lies in advancing public policy scholars' theoretical and conceptual toolkit for identifying sources of policy feedback, conditions for its (successful or failed) unfolding, and in improving our understanding of gradual policy development and policy change over time. Furthermore, it helps us exploring and uncovering how political actors' strategic considerations of feedback effects influence the formulation of public policies.

The Joint Center for Energy Storage Research: A Lesson in Depoliticizing Science and Technology

Matthew Shapiro (Illinois Institute of Technology)

The U.S. Department of Energy-funded Joint Center for Energy Storage Research (JCESR) fuses together basic research, battery design, and pathways to market, exemplifying the high-risks, high-costs, and market entry-challenges of sustainable energy technology. There are many remarkable characteristics of JCESR, particularly its dedication to networking across research sectors, institutions, and countries. In just three years, JCESR has surpassed its goal of annually producing 100 research publications on advanced battery technology, thus expanding and consolidating the global network of battery-related R&D. These networks are difficult to establish due to concerns about knowledge spillovers, high investment costs with no guarantees of success, and coordination problems. Beyond this goal to advance basic science, however, JCESR is intent on creating a prototype of a compatible electrical grid and transforming the transportation sector. In other words, JCESR's impact, if successful, will be wide-sweeping, radical, and require industrial changes both domestically and abroad. It is remarkable how JCESR has managed to continue to retain political support – even grow steadily in size – while offering a significant threat to the bottom lines of the fossil fuel and automobile industries. Given the current practice of publicly castigating publicly funded science, particularly making claims of its wastefulness, frivolousness, and detachment from the needs of the American public, JCESR's ability to advance relatively unhindered must be understood. Basically, JCESR frames itself as an advocate for the public and for policy makers by ultimately reducing energy costs and pollution. Framing in terms of climate change mitigation or greenhouse gas emissions reductions is entirely absent despite the fact that they are the long-term targets for JCESR's sustainable energy technology. Is JCESR's approach representative of the future of science and technology directives? Is JCESR an anomaly? What JCESR has done is apparently learn from many of the challenges faced by previous recipients of Department of Energy funding as well as embrace the tenets of the Triple Helix model of innovation, thus relying on the private sector from the outset in order to incrementally address the needs of the marketplace.

Evolving interest coalitions and deployment policy design: Comparing the Swiss and German feed-in tariffs for renewable energy

Leonore Haelg (ETH Zurich)

Tobias Schmidt (ETH Zurich)

Sebastian Sewerin (Delft University of Technology)

Research on the origins of policy inventions and the socio-political conditions that allow them to be implemented has received little attention compared to, for example, research into the effect of specific policy interventions. Only recently, studies have begun to systematically analyze the pivotal early phase of major energy-related policy schemes. Yet, these policy innovations set the scene for the long-term trajectories of policy mixes, with subsequent developments primarily reproducing existing patterns of policy instrument use and policy design. Against this background and in line with the debate about policy design being more decisive than instrument types for reaching intended policy outcomes, we seek to shed light on the differentiation across technologies and applications within the design of low-carbon technology deployment policies. Comparing the invention and subsequent evolution of the German feed-in tariff of 2000 (EEG) with the later establishment of the Swiss version of 2009 (KEV), we use process-tracing methods to investigate the causal mechanisms between technology diffusion, technology architecture, technology-related stakeholders, and policy design characteristics of the EEG and KEV, focusing on application and technology specificity. To collect empirical material, we analyze policy documents and parliamentary debates, and conduct interviews with experts and stakeholders who were involved in the respective policymaking processes.

Based on our research we derive the following hypotheses: First, the more adaptations at the core of the technology architecture an application requires, the more the interests of technology suppliers and users become aligned resulting in stronger advocacy coalitions in favor of application-specific policy design. Second, the fewer adaptations at the core of the technology architecture an application requires, the less the interests of technology users and producers become aligned resulting in users and producers supporting different policy designs in terms of application specificity and technology specificity. Third, the more the interests of different groups are aligned and, consequentially, the stronger the advocacy coalition in favor of a specific policy design is, the stickier the policy design proves to be, i.e. the harder it will be for opposing advocacy coalitions to remediate the policy design in place.

Our study helps to explain and understand differences in policy design between countries which is shaped

by the co-evolution of technology diffusion and technology-related actors. Specifically, we shed light on actors' involvement in the invention and subsequent design of deployment policies.