

Design and dynamics in the governance of energy systems: the development of policy instruments

Jan-Peter Voß

Öko-Institut, Berlin & Institute for Governance Studies, University of Twente

j.voss@oeko.de

DRAFT VERSION

1 Introduction

Transformation towards sustainable energy systems requires new forms of governance. Research over the last years has analysed deficiencies and brought forth new ideas and approaches. The conditions of implementation for new governance forms such as strategic niche management, transition management, sustainability foresight, progressive appraisal, or, more generally, reflexive governance, however, are not systematically considered. Policy proposals are presented as if there would be an omnipotent actor, a philosopher king or benevolent dictator, who is placed somewhere outside of the societal dynamics under investigation and who would make rational decision about what to do to achieve sustainable development. Moreover, it is assumed that this actor, referred to as ‘the state’ or just ‘public policy’, has sufficient oversight and power to implement any kind of policy proposal, to choose a specific design and make it work in practice.

Everybody who is familiar with literature on governance or has some practical experience with policy-making would agree that this is not the reality of governance (including the authors that write about it in this way). The assumption of an impartial, rational and omnipotent actor is for the sake of reducing complexity. This allows focussing on the articulation of problem-solving requirements coming from the dynamics of social-technical-ecological systems. Requirements and promises are foregrounded, conditions of realisation and risks of failure are backgrounded. This enhances the productivity of policy analysis and may give motivation and orientation to political activities.

That the articulation of functions occurs somewhat independent of the process of configuring real world constellations is a general feature of design. Design processes can be understood as a the mutual adaptation of function and configuration.

Yet, there is also a general problem of design linked with the distance between drawing up functionalities and making them work in practice becoming too big. The illusionary imagination of the actualisation of functionalities being unproblematic can then become counter-productive. When designs are developed irrespective of conditions of implementation they lack political robustness and entail an increased chance of producing unintended ‘side-effects’. It is thus necessary to complement the illusion of the ‘state’ and ‘public policy’ as external, rational, omnipotent steering agent of society by a more realistic view on governance as a structured field of social interaction that is part and parcel of socio-technical structure and dynamics of societal change (e.g. in patterns of energy production and use).

Governance studies portray a picture of the actual process of policy-making where there is no centre of steering and steering actors are embedded. Governance is structured in specific ways, develops own

dynamics and portrays specific trajectories and path-dependency. All in all, governance appears as a system of its own with similar problems of transformation towards sustainability as it is supposed to solve. Governance structures exhibit own dynamics of innovation and change.

Thinking about approaches to transform energy systems such as new policy instruments must have a look at these specific dynamics of governance and their co-evolution with socio-technical and ecological dynamics of change.

The relative neglect of distributed agency, structuration and dynamics of governance in policy proposals for socio-technical change is all the more surprising as the background and indeed something like a 'founding myth' of studies of socio-technical dynamics is an emphasis on the systemic embeddedness of innovation in the realm of technology. Policy proposals are derived from a thorough understanding of the intricacies of creating and implementing novel designs in pre-structured contexts of development and use, the precariousness of the 'instrumentality' of designs and the difficulty of path-breaking innovation and lock-in in the realm of socio-technical change.

What I attempt in this paper is to extend this perspective to the realm of governance and by this way arrive at new insights for conditions of implementation. This will have implications for the development of robust and appropriate policy designs.

But where to start then? How can we think and go about including change towards sustainable development in energy, if an archimedean point is lacking, if public policy itself is subject to the same problem of being caught in unsustainable trajectories as the energy system itself?

I tackle these questions by looking at the development of policy instruments as innovations in governance. This puts a focus on how novel patterns of governance emerge from the interaction of multiple actors and in interaction with broader contexts. Innovation studies in the realm of products and technologies have given rise to notions such as innovation journey and technological regime. I will explore how these patterns and dynamics can be heuristically applied also to the development of policy instruments as 'designs on governance'. I reconstruct the innovation journey of two prominent policy instruments from energy policy debates of the last years: emissions trading and network access. My analysis of the process by which these instruments come into being, transform governance patterns in energy systems and in this way shape socio-technical developments allows for an understanding of innovation in governance as embedded in broader energy system dynamics. It draws attention to the limits of injecting or imposing designed solutions from the outside. But it also reveals how policy instruments and their embedding in governance is socially shaped and can be reflexively influenced by different actors at various stages of development, even if it cannot be controlled from one point, say a research institute or a government department. This has implications for how to go about designing governance and reconfiguring political institutions. It requires an approach that is reflexive with respect to the embedding of design in broader dynamics. The implication is that governance becomes less a matter of engineering than of gardening, less a matter of hunting than gathering (March, Olsen, 1989).

The first part of the paper conceptualises the development of policy instruments as innovation journeys in governance, taking up an apparent paradox of instrumentality that is linked to generalised policy approaches. The second part of the paper presents the two cases and elaborates specific patterns of innovation in governance. In a third part I highlight factors of influence and discuss implications for political strategies.

2 Dynamics of governance and policy design

I first need to present a conceptualisation of the policy process that is capable of reflecting structural dynamics of governance as well as continuous efforts at designing patterns and controlling outcomes as is exemplified in policy instruments.

Weimer defines policy design as the “art of finding solutions to policy problems that specify desirable relationships between manipulable means and obtainable objectives” (Weimer 1992: 370). As such it is a core business of policy analysis. Increasingly also public political discourse becomes more technical in the sense that it focuses on the effectiveness and efficiency of alternative policy options rather than on the ideological or moral integrity of public action.

In this discourse policy instruments play a central role. Since the 1980s policy analysis shifted attention away from specific capabilities of states as steering actors and amenity to steering of sectors of society towards the patterns that mediated this relationship. This brought up the notion of policy instruments as general means of steering and a focus on their development and assessment as generic options, blueprints, or models of governance. As such they entail the promise to deliver expectable social outcomes, if knowledge of how society works is combined into packages that can then be applied by policy-makers. Policy instruments imply the vision of ‘tools’ for shaping of societal development that can be tested, refined and further developed. As such they offer an alternative to “tinkering along”, “reinventing the wheel” or unconsciously “trotting along beaten paths”, a way to make public policy more rational and productive.

In this perspective policy instruments transcend, or are made to transcend, specific governance contexts. They are “cosmopolitan” models of governing which are made available for global transfer. They contain operational principles, blueprints, instructions for installation and use for institutional configurations which can be expected to work in a specified way. In order to make policy knowledge relevant to various contexts and situations, specific policy goals, cultural values, institutional contexts of implementation are stripped off so that what remains can be seen as the technical core of policy. That is their strength, but also their weakness. When being implemented, they need to be re-contextualised.

Since the emergence of the concept of policy instruments there had been a debate about the appropriateness of the concept, especially in its appearance as the metaphor of mechanical tools. Much of this debate is related to the programmatic neglect of peculiarities of governance in specific contexts. Critics accuse the concept for misrepresenting the complex and contested reality of policy-making and position it as a rhetorical device to objectify the genuinely political character of policy. This notwithstanding, policy instruments play an increasingly central role in political debate and the design of political action programmes. And the tool character remains undisputed, for example, in debates about how to transform energy systems by the promotion of renewable energy, the regulation of emissions and fostering of innovation.

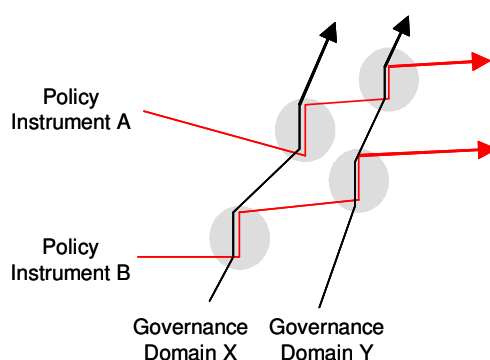
As an attempt to accommodate this apparent paradox, I look at policy instruments in a new way as ‘designs on governance’. This implies that ‘tools’ in relation to public policy is only part of the story. They are part and parcel of broader processes and dynamics of governance. They are models which are themselves a product of political processes. But at the same time, they can also influence the dynamics of governance, as it happens or intentionally, in attempts to innovate governance. In that sense, one can speak of designs *on* governance. The notion captures the ambivalence of policy instruments that is linked to the possible divergence between the process of model development and the reconfiguration of actual

practices and institutions. Designs on governance are models for and of reconfiguring governance. Tensions between the promise of the model and dynamics in the real world are at the heart of policy instrument development.

Policy instruments lead a double life as configurations that work and models of governance. Both lives are interdependent. This provides a special view on design on governance and its particular dynamics. Design is itself a process in which model creation and reconfiguring of real world governance interact. Designs develop in interaction with real world governance. This is the interplay of design and dynamics in policy instruments. The design embodies a productive illusion and in reconfiguration processes actual dynamics of governance appear.

Their role in governance can only be understood by taking into account how they interact with dynamics in governance over time. Instead of taking policy instruments as objects that somehow exist, the process of objectification becomes a matter of empirical research. Thus, investigating how policy instruments come into being as designs, take shape and change over time as well as how they concretely take effect in the policy process. Such “innovation journeys” are interesting to reconstruct in their own right, as I will show in the next section.

The way in which policy instruments play a role in governance and produce special effects in societal development is not so much in distinct instances of “application”, but in the shifting and partially cumulative unfolding of the tension between model and configuration over time. As I have already noted briefly, one can think of how a model emerges and is brought into interaction with real world governance dynamics, and how trajectories take shape in coupled developments of a model and configurations (and in wider contexts). If policy instruments have effects, it is because of gradual alignment of models and configuration – including setbacks and failures in this process and the possibility of alignments unravelling and trajectories vanishing. For empirical research, this shift in perspective can be captured with the phrase “follow the instruments!” The question then is how such processes can be studied.



I will refer to the development of policy instruments as innovation processes in governance. Innovation processes, whether studied in history and social studies of technology or in evolutionary economics of innovation, are seen as entanglement of design and dynamics. Innovation involves envisioning of something new that might work in producing a particular effect, as well as activities to recombine elements of a given structure into a new configuration. This is the design part. But innovation also

involves accidents and surprises: new options and opportunities opened up by ongoing changes in the world, as well as elements that resist reconfiguration and continue having their own interactions. This is the dynamics part. Thus, innovation is indeed a process of iterated interaction of design and dynamics. While an innovation process perspective promises concepts that can capture the development of policy instrument, the question remains as to which specific concepts have a role to play.

I cannot fall back on existing conceptual work on patterns and dynamics of innovation processes in governance.¹ What I will do to overcome the shortage of concepts for innovation processes in governance is to position policy instruments as a form of technology, a societal technology. Then, concepts from studies of technological innovation processes can be imported directly, at least as heuristic devices, for the analysis of the development of policy instruments.²

In a social, non-deterministic view of technology development, emergent outcomes of “distributed agency” (Garud, Karnoe 2002) are highlighted, and relevant social groups linking up with “interpretive flexibility” of technological functions and gradual achievement of closure and stabilisation (Pinch, Bijker, 1987). Especially in Actor-Network Theory, the focus of study has shifted from artefacts to the emergence and stabilisation of socio-technical networks in social interaction. Rip and Kemp (1998) introduced the notion of ‘configuration that works’ as an open concept of technology which does not presuppose a merely physical structure as in the traditional notion of artefacts, but is open to integrate different kinds of elements that are linked up and work together in producing a certain performance. The essence of technology development then is to configure all the different elements that are needed to produce a performance, assign them a role in interaction with other elements and stabilise the so-achieved configuration to create some security of expectation about the result of their interaction – technical reliability, as it were (Disco, van der Meulen, 1998).

Based on the notion of the innovation journey that van de Ven et al. use to map their case studies on innovation processes in organisations, Rip and Schot have developed an extended concept to analyse emerging trajectories of technological development (Rip, Schot, 1999; 2001), which is useful for my

¹ While possible candidates could be found in research approaches that go under headings such as policy innovation (Polsby, 1984), regulatory innovation (Black, 2005) or institutional design (Goodin, 1998/1996; Olsen 1997), none of these approaches takes policy instruments as their focus. All of them investigate innovation as the appearance of novel patterns within a particular domain. #here also short review of policy transfer and diffusion research#

² This move is considerably facilitated by developments within technology studies that have brought the notion of technology far into the social realm – as far as conceptualising technology development as a process of institutionalisation (Bender, 2007) – or shifted the focus of analysis to technology as socio-technical configurations and networks – up to an entirely symmetrical conception of human and technical entities as “actants” (Latour, 1992). This notion of societal technology may well be a Wittgensteinian ladder in the sense that I may not need this linkage between policy instruments and technology, once the concepts that I develop in this way become supported by, and/or adapted because of evidence from empirical studies of policy instruments. For the time being, however, I can use this ladder to reach over into the field of science, technology and innovation studies and pick up concepts that allow me to construct process patterns which can guide empirical research. The notion of societal technology as I use it differs from earlier and current references to ‘social technology’ or ‘sociotechnology’ which take technology to be a natural outcome of universal rationality and allowing the scientific conquest of nature as well as society. Instead, I see technology as societally constructed. This immediately makes it a location and a medium of politics and eliminates a fundamental distinction between rational technology and contestable policy.

purposes. With some modification I can use this to distinguish typical phases of the innovation journey of policy instruments:

The development of policy instruments can be mapped as a process of alignment across the fields of (social) science, policy development (in research, consultancy and public administration) and the governance domains that are (potential) contexts of application.

A phase of *gestation* brings up precursors in the form of new options, such as theoretical social mechanisms, variations in practice, emerging pressures on existing governance regimes, but still without the linkages that lead to a new configuration.

A first critical stage is developments towards linking-up elements into a new configuration that could work. These developments need a *protected space*, shielded from immediate pressures of the political selection environment. If they are successful they establish a “proof of principle” that a new operational principle might work to produce a certain type of governance outcome. A key dynamic pattern in this phase is the so-called “promise-requirement cycle” (van Lente, 1993). The cycle starts with positive feedback between promises of ‘would-be technologies’ which become articulated to receive protection and mobilise resources for first developments, and requirements that become articulated in response. This can give rise to a spiralling-up process of responses to the requirements, new versions of the technology become successively articulated, and the openness of development that was there when it was just new options becomes narrowed down. In a similar way, March and Olsen (1989: 81) draw attention to the key role of promising economies in institutional reform processes.

Partly overlapping with this phase, the next phase is about *prototyping* of a new policy instrument with articulated functional principles. The first steps are taken out of the protected space and into real world governance contexts. Experiments with implementation occur when niches become available that can provide an amenable local selection environment within the structures of a governance domain. Learning and first-round embedding takes place within these niches. Communities of practice emerge, sharing special experiences and skills. This is when the policy instrument becomes widely recognised, articulated, labelled. This is an important moment of stabilisation. It makes the configuration independent of its creators and their ongoing reproduction and repair work. Palier (2007: 97) points out such a reversal from an “if” to a “how” discourse in his analysis of pension funds reforms in France.

After proof of principle and experimentation with prototypes, a fourth phase begins if the instrument is able to *branch out* from initial niche applications into new and wider openings within the original governance domain and beyond. If experiences, skills, legitimisation, resources, social support from various implementation sites can be linked up with each other and have cumulative effects, the innovation develops momentum and will stretch (or even crack) established governance structures, thus creating further space for expansion and diffusion. Enlarged scope and broader diffusion of the instrument also lead to the differentiation of special skills and services (such as legal advice, financing, training), emergence of professional institutions and organisations that are directly linked-up with the policy instrument and its further development.

In this phase of expansion and diffusion, local communities of practice become arched over with organisational structures that guard and retain the instrument by providing support for implementation. Benchmarks, standards and certification schemes come up, which are indications that *a regime* (a set of rules) is formed around the new instrument. The regime cuts across governance domains, and is in principle transnational in scope. It stabilises and supports the policy instrument within particular domains

of application. It represents a particular social structure that is arranged around and geared towards a particular *means* of policy, a *technique* of governance. Similar patterns are referred to by governance studies under the heading of “regulatory regime” (Black, 2005; Eberlein, Grande 2005) – even though they are usually defined with respect to dominant regulatory practices within a particular domain, not by different types of regulatory practices *per se*.

In addition to this phases heuristics it is important to note that innovation does not occur in pristine environments, already existing patterns provide the context for the development of policy instruments (cf. Rip 1995). Instruments developed at an earlier time have now regime structures in which they are embedded. They may have developed particular social constituencies which became institutionalised and closely connected to the institutions of public administration and to political culture. Specific technological regimes may be anchored in particular governance domains (e.g. command-and-control in German environmental policy) or in institutions (e.g. market-based instruments in OECD). Such components of the context of a newly developing policy instrument must be considered, because they bind resources (e.g. attention by policy makers, financial resources) and have sunk investments (e.g. trained skills in public administration) which are not freely available for any other new design project.

As a final step in conceptualising the development of policy instruments as designs on governance I build upon Kingdon’s multiple stream model of the policy process. I adapt it in order to create a broader picture within which the development of policy instruments can be embedded. I do this by positioning innovation journeys as specific trajectories within a dynamic stream of interactions and events that have to do with the development of policy proposals.

Kingdon conceptualised three independent streams: problems, policies and politics. These flow through the political system. Their interaction brings about the dynamics in the policy process: “The separate streams of problems, policies, and politics each have lives of their own. Problems are recognized and defined according to processes that are different ways policies are developed or political events unfold. Policy proposals are developed according to their own incentives and selection criteria whether or not they are solutions to problems or responsive to political considerations. Political events flow along their own schedule and according to their own rules, whether or not they are related to problems or proposals. But there come times when the three streams are joined. A pressing problem demands attention, for instance, and a policy proposal is coupled to the problem as its solution. Or an event in the political stream, such as a change of administration calls for different directions. At that point, proposals that fit with that political event, such as initiatives that fit with a new administration’s philosophy, come to the fore and are coupled with the ripe political climate. Similarly, problems that fit are highlighted, and others are neglected” (Kingdon, 2003/1995: 201).³

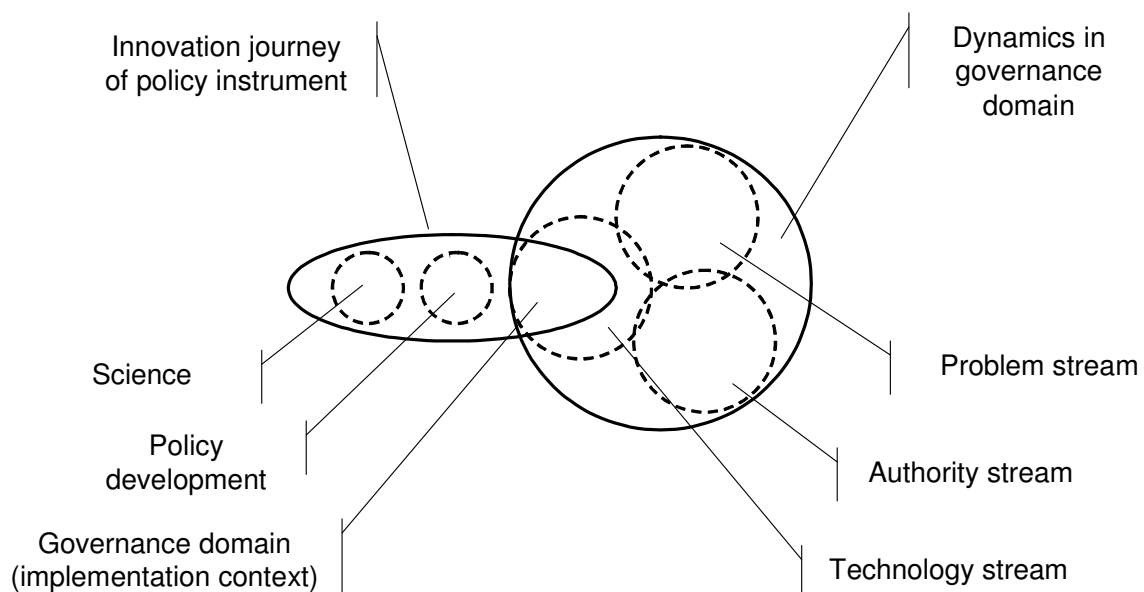
Before I can merge the innovation journey concept with the multiple stream model of the policy process, I need to introduce some changes to Kingdon’s model. This is, because his conception of the three streams, especially the denotation he uses, may cause some confusion. First, I propose to rename the “politics stream” as “authority stream”. This is because this stream refers to the political struggles going on over gaining (institutional) authority. Politics in a more general sense is also part of problem formation

³ With this general conception, Kingdon follows a “garbage can” model of organisational choice that draws attention to problematic preferences, unclear technology and fluid participation as properties of “organized anarchy” in the decision making of large organisations such as universities and ministries (Cohen et al. 1972)

and the development of policy options. A second change refers to the “policy stream”. Here, I propose to rename it as “technology stream”. This is in line with the positioning of policy instruments as societal technologies. This label indicates that processes in this stream are an independent sub-process in which instrumental designs become formed. These may become part of policies as more comprehensive programmes for political reform. Policies in this sense are not located within one stream, but are the outcome of interaction across the streams, more specifically: the linkage of problems with authority and with technologies that promise solutions. The adapted multiple-stream model thus comprises:

- Technology stream: Policy experts produce policy instruments (to be applied by authorities to solve problems)
- Problem stream: Societal discourse produces problems (to be solved by authorities with appropriate instruments)
- Authority stream: Political struggle produces positions of authority (in the course of which instruments are employed to promise the solution of problems)

The overlap between this adapted multiple-stream model and the model of the innovation journey of policy instruments as introduced above now appears to be quite obvious. The governance domain that represents the application context for policy instruments in the conceptualisation of an innovation journeys can be specified as a dynamic environment driven by interaction between streams of problems, authority and technology. From perspective of governance dynamics within a particular domain, innovation journeys of policy instruments appear as processes that take place within the technology stream. They represent specific processes of structuration in the ongoing development of technology for policy. The interaction between the innovation journeys of different policy instruments gives the technology stream its own life that Kingdon observed, but did not conceptualise.



With this conceptual framework of policy instruments as designs on governance and their interaction with broader dynamics of governance I can now turn towards two cases that can enrich our understanding about how policy instruments develop and how they are linked to the formation of trajectories in the development of governance in energy systems.

3 Innovation journeys of policy instruments: emissions trading and network access

Emissions trading and network access regulation are two policy instruments whose development and wide spread diffusion was part of a fundamental transformation in the governance of energy systems around the world. Emissions trading as a market based environmental policy instrument is linked to the establishment of a new trajectory in market correcting social regulation of energy. This field was before dominated by a command-and-control based trajectory. Network access regulation is a key element in market oriented regulatory reform. It is linked to a trajectory in market making economic regulation of energy services (and utilities more broadly) which is based on market competition. This emerging trajectory disrupted a pre-existing regime of vertically integrated monopoly. In the following I give a brief summary of the innovation journey of each of these instruments and highlight characteristic features of the interaction between the instrument and dynamics in the governance context. I then turn towards some key insights on dynamics of designs on governance from the analysis of the two cases.

3.1 Emissions trading

Emissions trading addresses the need to regulate the release of harmful gases into the atmosphere by making use of the market mechanism. The basic concept is to define a total amount of emissions for a population of installations (usually an entire sector of the economy), issue allowances for a proportionate amount of this total, and let these be traded freely among those actors who wish to produce corresponding amounts of emissions. According to economic theory, this will lead to the optimal allocation of emissions: Those who are willing to pay the most for the allowances are the ones who face the highest costs of reducing emissions. Other ones who have cheap opportunities for emission reductions will prefer to exploit them rather than buying permits. Emissions trading thus promises that whatever level of emission control is politically required can be achieved in the most efficient way, at minimal cost to society. Or, the other way round, each amount of money spent on emission control produces the highest possible effect for the environment (Baron, Philibert, 2005; Dales, 1968; Tietenberg, 1985).

Figure 1 gives a brief overview of the major events in the development of emissions trading as a new policy instrument. The vertical axis indicates the scope of application of the instrument in various instances of implementation. The dotted lines represent informal influences between instances of implementation, the solid lines represent formal legal relations.

The innovation journey comprises four phases. Delineation of phases is based on specific mechanisms of alignment and stabilisation of a trajectory. In the case of emissions trading, the four phases of gestation, proof-of-principle, prototype and regime formation, as they were adopted from studies of product innovations, can be clearly identified. A first phase of developments comprised emerging practices of flexible regulation at the Environmental Protection Agency (EPA) in the USA. At about the same time, starting a little earlier, new theoretical options for the design of regulations for environmental protection

were developed in economic theory. While these were developing largely independently of each other, a transition occurred: in the course of revisions of the existing legal framework, an interstice opened up that allowed for experiments in which practices of flexible regulation were merged with economic theory. With protection from a new government, an organisational unit at EPA was turned into a laboratory and brought about a first functioning programme as proof-of principle of emissions trading as a new policy instrument. Specifics of the space in which it was created hampered the performance of this first programme. The transition to the next phase involved the construction of a prototype. Development of the prototype drew on theoretical knowledge on design options as it had built up in evaluation of the first experiments. It was accompanied by extensive network-building and consultation efforts that created key linkages with the environmental governance context in the USA. This prototype worked as an exemplar for several other programmes within the USA. A final transition occurred when the emissions trading design was linked to global climate policy. In this way, it created expectations of global markets for emission rights and incited anticipatory preparations in business and public administrations outside of the USA. When the implementation process on a global level broke down, the design was taken up by the European Commission to establish an emissions trading system for greenhouse gases for all 25 Member States. In this phase which is still ongoing, emissions trading expands and is further developed in the context of a global regime that comprises the ‘carbon industry’ as a newly created business sector and a growing infrastructure of specialised organisations in academia, policy analysis, public administration, finance, and industry.

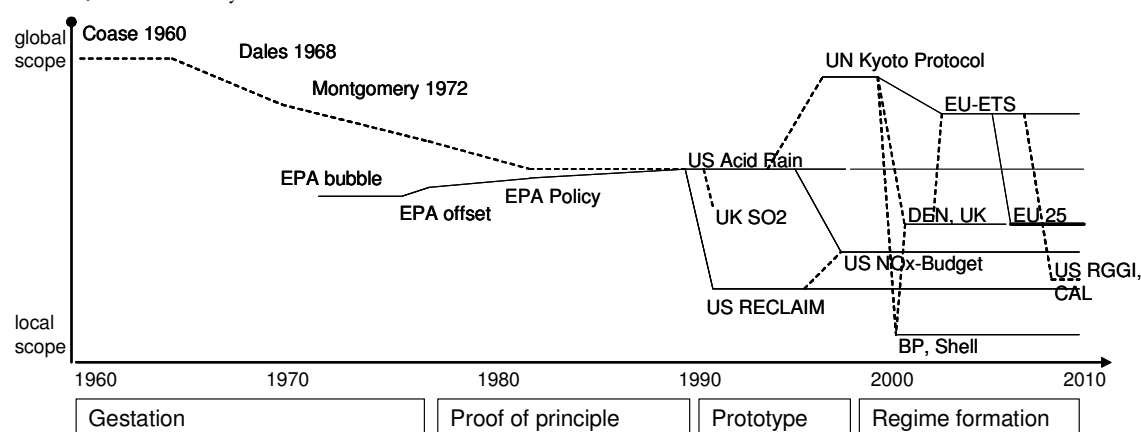


Figure 1 Outline of Emissions Trading's Innovation Journey

The case offers interesting insights into the double life of policy instruments. Some findings will be highlighted that indicate specific ironies of design even in the case of a conspicuously triumphant instrument.

Emissions trading started with economic theory and regulatory practices as two origins that merged in course of the innovation journey. The separation between the lives as a model and as configurations in practice, remained all along. While the model became adapted and took on a remarkable degree of sophistication as it interacted with requirements and dynamics of actual configurations of governance, a pure and ideal model of emissions trading was maintained and survived. It is still taken as a reference to articulate and theoretically substantiate the promise of a lean and efficient environmental policy instrument (e.g. in competition with alternative instruments such as taxes or emission standards). At this

level of debate, special design features like banking and borrowing, zoning, allocation rules, provisions for new installations, technology benchmarks, auctioned reserves, registries, transaction logs, exchange market and brokering regulations are backgrounded. These are crucially important, however, in really existing emissions trading. There are inscrutably complex rule systems that developed from repair to the basic design to make configurations work in practice. Upon implementation, complexities of real world politics that were backgrounded in economic models re-emerge and need to be dealt with. While advertised as a lean and efficient instrument that substitutes administrative discretion with the invisible hand of the market, emissions trading in reality is an impervious complex of new rules and administrative structures that spans the public and the private sector.

The contrast between the model of emissions trading and its reality in ongoing configurations illustrates the irony of design on governance. The two lives of a policy instrument, model of governance and real world configurations, can indeed develop dynamics of their own: the model is nourished and cherished by a global design community, and configurations work only by accommodating and cobbling together bits and pieces from local governance dynamics in specific contexts of implementation.

There are further findings. The increasing complexity of emissions trading designs-for-implementation, for example in the European Union, while important for local effectivity, also decreases transparency and creates practical difficulties of exercising democratic control over policy development. (Wettestad 2005) refers to the latter when explaining the quick passage of a European Directive on emissions trading by (among other things) a “technological deficit” of the European Parliament that prevented it from finding focal points for coherent and directed engagement in the design process.

On the other hand, the growing sophistication of rule systems creates demand and a specific role for specialised ‘technologists’, an expert community for developing and operating emissions trading. The more repair work is necessary, the more demand there is for their services. The larger the distance between global model and local configurations, the more design work is necessary to bridge this gap by adapting design and evaluating configurations.

This gap is filled by actors beyond established environmental policy networks. “(...) market intermediaries and other potential service providers (auditing companies, consultants, lawyers, academics, commercial conference organisers) saw a potential market arising and were more than willing to invest some resources under the header of business development.” (Zapfel, Vainio 2002: 7). Their “helper’s interest” (Prittwitz, 1990: 116-121) brought forward exploratory studies and research and development activities in Europe which were justified by the need to be prepared for upcoming policy debates. In these years, part of the dynamics was the emergence of what is now called the carbon industry — an increasingly organised sector of specialised businesses that provide services for the development and maintenance of emissions markets.⁴ The International Emissions Trading Association (www.ieta.org) was set up in 1999 to promote the worldwide development of emissions markets. Its members are specialised consultancies, banks, brokers, exchanges, risk managers, project developers, journals, conference organisers, news services, etc. Emissions trading gained additional momentum – not only as an environmental policy instrument, but

⁴ In a recent study Müller (2007) distinguishes the following groups of actors as part of the ‘emissions trading business’: traders (intermediaries, broker, trading depts. in industry, exchanges), consultants (business and legal), project management and development, verification of emissions, investment funds, research institutes and universities, public administration, information services and conference organisation, interest groups.

also as a thriving service economy which started to actively advertise its products and lobby for the expansion of its market.

Specialised organisations, most visibly the IETA, directly engage with policy processes in relevant field such as environmental and energy policy, but also general economic policy – on behalf of the instrument. They advocate further development of regulations to standardise local market configurations and to reduce uncertainty on emission markets. And they promote expansion of the instrument to other countries and sectors with the objective of the “development of an active, global greenhouse gas market” (IETA, 2007). Apart from lobbying, the IETA is active in carrying out and coordinating research and development on emissions trading. It describes its various roles as “think tank and research, convenor of dialogue, advocate, market promoter” and “market standardiser” (IETA, 2007). The activities of IETA gain weight through the membership of more than 150 international companies, among them large transnational companies such as Barclays Capital, Deutsche Bank, JP Morgan Chase, Munich Reinsurance, BP, E.On, General Electric, Dow Chemical, Goldman Sachs International, Lloyds Register, KPMG and Pricewaterhouse Coopers. (Müller 2007) estimates the cumulated volume of all emissions trading markets in 2005 at 45 billion Euro. That is about twice as much as the volume of the pharmaceuticals market in Germany in the same year. This is another indication for the momentum that emissions trading gains by the economic interest that the instrument generates.

An example of the effectiveness of business interests in bringing about policy change is that in 2002 the UK government endorsed and financially supported a pilot scheme of greenhouse gas emissions trading as one of the first countries in Europe, because it was thought “to enable business to gain practical experience of emissions trading ahead of a European and international system, and to help the City of London establish itself as a global centre for emissions trading” (DEFRA, 2003). “Although the UK emissions market will not be large in relation to other financial markets, the international emissions trading scheme is likely to be valued in multiple billions sterling, and will bring commensurate benefits to the City if trading activity is based here” (DEFRA, 2001).

These are further aspects of how the ‘technological regime’ that builds up around emissions trading (and of which the carbon industry is a part) generates a momentum for further development of the instrument partly independent of its actual performance with regard to environmental policy goals. Within the regime, the policy instrument is an end in itself. A special twist to this is that the costs of regulation that are the basis of existence for a specialised technological regime do not appear as costs but as economic benefits. The development and operation of emissions trading gives rise to a new service economy of specialised researchers, evaluators, consultants, verifiers, lawyers, financial service providers etc. The privatisation of policy design thus brings about a thriving modern – and clean! – business sector. This adds a special dimension to the ‘social life’ of emissions trading.

The duality of the instrumentality of instruments is particularly visible here. What gives emissions trading as a design on governance its strength is at the same time the reason for it escaping control. Strong designs instrumentalise problems and governments just as much as governments may use them as instruments.

3.2 Network access

Network access regulation addresses problems that occur with competition in utility sectors like telecommunications, electricity, gas, water and railways. Such problems came up with attempts to

deregulate utility sectors that had been run by publicly owned or regulated monopolies. The instrument presupposes isolating natural monopoly elements and treating them as separate markets within the utility sectors for which particular regulatory arrangements are required. The basic concept of network access regulation as a policy instrument is to regulate natural monopoly segments to provide a common service for competitors in other market segments. For network infrastructures in utilities this implies open non-discriminatory access. The idea is that with respective regulation for network services in place, competition can unfold in other market segments (such as supply, trading, and retail provision). The challenge is to develop a configuration that guarantees quality of service, non-discriminatory conditions of use and efficiency.

The development of network access regulation is linked to a process of debating natural monopoly (in law and economics) and hinges on the gradual emergence of a view on the utilities as a chain of vertically related stages of production of which transmission/transport via networks is one stage that can be isolated from the others and be treated as a self-contained activity.

I present the innovation journey in four phases (Figure 2). Separation of phases relates to transitions between stages of maturity of the instrument in terms of stabilised configurations that work in specific concepts and the articulation of design principles. Important steps in the unfolding of policy instruments are cosmopolitanisation and diffusion of designs and the institutionalisation of global design communities linked to emerging technological regimes in governance whose dynamics start to shape local reconfiguration processes by framing problems and what can be regarded a solution.

The development process that brought up network access regulation as we know it today includes the development of precursors in interstices of the regime of publicly regulated monopoly as well as the softening up of this regime by agitation for deregulation. This is what I present as a first phase of the innovation journey which can roughly be timed from the beginning of the 19th century to the end of the 1970s. Precursors of network access regulation were always in place in form of legal anti-trust doctrines and special agreements within the monopoly regime. Softening up of the established regime happened especially in the last decade of this phase in the USA with the Chicago School playing a central role in positioning economic arguments against the public regulation of utilities.

This was followed by a second phase which saw actual attempts at deregulating utilities in the USA, but also in other countries like Chile, UK and New Zealand and brought up problems with making competition work. These problem seriously hampered market opening in the utilities. They came to be perceived as reverse salients for the regulatory reform project and posed requirements for new solutions beyond the abolishment of special market regulations. Dispersed learning with new forms of regulation set in within spaces for experimentation protected by a strong agenda for liberalisation. This lasted until around the end of the 1980s when another phase set in with the articulation of network access regulation as a policy instrument to resolve the problem of reverse salients in the liberalisation of utilities. The articulation of a governance model happened in the course of repeated privatisation experiments in the UK. Linked to the articulation of a governance model was the gradual establishment of a perspective in which network services were isolated as a separate market within the utility sector. The task of regulating networks could then be distinguished from the task of deregulating other parts of the sector. The deregulation task was transformed into a re-regulation task without completely having to give up on the idea of introducing competition in the utilities. The British model was rapidly taken up and turned into a cosmopolitan solution for liberalisation of utilities. Network access regulation promised to overcome

reverse salients to liberalisation and, in combination with a dominant perception of a problem of inefficiency in the utilities and political interests in privatisation, unleashed a global wave of reconfiguring governance of the utilities to introduce competition. This phase dominated the first half of the 1990s. The last phase of the innovation journey as we can observe it until today, is marked by an unravelling of the dominance of the British model upon humbling experiences with implementation in various local contexts which diverged considerably and in some cases led to a break-down of utility systems. This phase shows the reassertion of dynamics in local contexts over a design of network access regulation that was mounted as a global solution but stayed short of controlling actual reconfiguration processes. Design work continues in a scattered regime of loosely coupled local reconfiguration processes and a weakly institutionalised cosmopolitan design community.

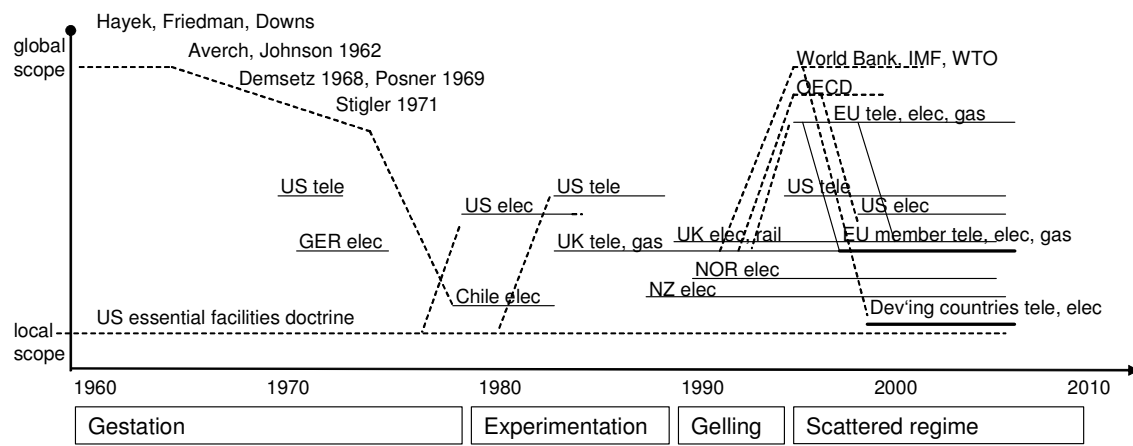


Figure 2 Outline of Network Access Regulations's Innovation Journey

Insights on the double life of policy instruments can be drawn. Linkages between the emerging 'economic standard model of regulation' and a broader regulatory reform agenda have been referred to. Metaphorically network access regulation can be described as a 'pampered instrument': it grows up with protection and support by powerful sponsors. I shall present some conclusions by exposing specific ironies of instrumentality that show up in this constellation found in the case study.

The development of network access regulation shows that policy instruments are actually strategically developed, or at least bred and nurtured, when they serve broader political agendas. In order to serve as instruments, designs must transcend local configurations and be able to import technical legitimacy to the political agenda (e.g. liberalisation of utilities). Thus there are incentives for cosmopolitanising local designs by decontextualising them and presenting them as best practice. This is helped by stripping off politics and institutional and cultural idiosyncracies of the context of origin and rationalising governance practices as technical models (see the apolitical 'economic standard model of regulation'). Policy instruments generated in this way can be successful as they allow to move ahead with the broader agenda which they should support. The case of network access regulation shows a remarkable effect in boosting blocked regulatory reform policy and setting off an avalanche of governance reconfiguration in utility sectors across the world.

This is an indication of the co-evolution of instruments with governance dynamics. The instrument does not take effect in local configuration work, however, where politics and institutional dynamics mess up neat designs and complicate the realisation of promises from governance models. In this case, co-evolution induces the detachment of a model from local practices and supports it in taking on a life of its own. Co-evolution thus contributes to the tension between model and configuration from which trajectories of policy instruments unfold – from both sides. The dynamics that interact with the model life of policy instruments, are on another level than the dynamics that interact with the configuration life. The former are not specific to local domains. They are phenomena of global political discourse and politics in the context of cosmopolitan institutions.

Linkage to global agendas can be a strong support for the development of instrumentality in governance. At the same time it establishes a dependence of designs on the persistence of support and protection by the agenda. This is the result of closely coupled development and lack of ‘intrinsic’ momentum of policy instrument. It implies the risk that instrument may not be robust enough to survive shifts in agenda.

An early example of pampered design is the case of Chile. The approach to liberalisation of electricity could already have become established as a model and proof-of-principle of network access regulation (with vertical separation and regulation of open network access). The ‘neo-liberal revolution’ in Chile, however, was so much entangled with the military dictatorship that the cosmopolitanisation of Chilean experience was hampered as it depended upon linkage with democratically illegitimate broader patterns of politics (e.g. neo-liberal ideology coupled with militarian authority).

In a later stage of the innovation journey the short lived nature of the ‘standard model of economic regulation’ as it was ‘pulled up’ from the UK context by an international movement (including authority of international organisations like OECD, World Bank/IMF and EU Commission) is an example. It boosted liberalisation in utilities and circulated globally within a few years. When the regulatory reform agenda unravelled the model could not be upheld against contradictions in local configuration work.

From the perspective of those interested in the instrumentality of designs on governance the coupling with and bolstering of an instrument by a strong political agenda entails the risk is that actors who cherish the instrument for helping them materialize their goals will have to continually protect and nurture it. ‘Pampering’ then becomes necessary to let it survive and be effective as ‘technology’ of governance. Current activities of the European Commission to develop the regulatory sciences in the Florence School of Regulation and to build up networks or regulators can be interpreted in this way. The establishment of a European regulatory agency could work as an institutional stronghold for network access regulation.

The bottom up development of possibly more robust regulatory practices in the current scattered regime context may indicate a shift towards autonomy of the instrument from the neo-liberal agenda and development of some intrinsic momentum.

These insights from the case allow for reconsidering the notion of ‘design on governance’. Policy instruments are not only co-evolving and coupled with broader governance dynamics in the dimension of configurations that work. Also as models of governance the life of policy instruments is embedded in and co-evolving with broader dynamics such as the formation of political agendas. They stimulate modelling work and pamper instrumental designs. In the same way, strong political agendas can be expected to stifle model development where it goes against their case.

4 Design and dynamics in governance

The cases show two different patterns of innovation in governance. Emissions trading shows a strong momentum of the policy instrument, the design with a life of its own, dominating broader dynamics of governance, for example, by influencing political debate about problems (climate change). Network access regulation, in contrast to this, developed in close interaction with and supported by broader dynamics. As a policy instrument it was ‘raised’ and ‘pampered’ in order to be able to present a technical solution to competition in utilities and move ahead with the regulatory reform agenda. These two patterns can be related to factors of ‘push’ and ‘pull’ that are well known from the study of technology. While emissions trading is linked to an innovation pattern in which novel arrangements in governance are pushed by the own dynamics of an instrument, network access regulation is linked to an innovation pattern in which the policy instrument got ‘pulled up’ by a policy agenda emerging from broader dynamics in governance, mainly linkages between dynamics in problem and authority stream.

Apart from such a differentiation of innovation patterns some other insights from analysing innovation journeys of policy instruments can be summarised under keywords of ‘division of design labour’, ‘social life of policy instruments’ and ‘the role of technical models in governance’.

The notion of designs on governance allows for some *division between design as models and design as coping with ongoing dynamics* in reconfiguring governance structures within particular contexts. The case studies allow more detailed insights into how the development of policy instruments reflect and further shape a division of design labour. They show how the reflection on the working of de facto governance is linked to the development of cosmopolitan models of governance within global design communities.⁵ The development of policy instruments, their gradual articulation and stabilisation as designs on governance takes place in interaction of these processes. In a certain sense, policy instruments live on what happens at the interface of global and local design work. The concrete manifestation of global and local and their relation may turn out differently in different cases. In the emissions trading case the model and a global design community (of economic scientists) was there from the beginning and played a part in initiating first development towards a working configuration. In the network access case a model and global design community only emerged gradually as local designs (emerging from repeated experiments in the UK) were cosmopolitanised and circulated. An important insight with respect to dynamics in governance is that policy processes within a focal domain (especially the design aspects) must be analysed with respect to interaction with global design communities and, in some case, embedding in global regimes of societal technology development. This introduces a cosmopolitan dimension to governance that is additional to what is captured by the notion of multi-level governance. It may be termed a special form of

⁵ Global design communities evaluate and compare existing governance patterns, develop and assess alternatives and accompany experiments with putting them in practice. In these interactions learning takes place in the sense of the development of knowledge and skills that reach beyond particular cases, but are to a certain extent transferable also to other situations. In order for this transfer to be possible configurations need to be decontextualised, real world governance patterns have to be generalised into abstract models for which it can be predicted under *ceteris paribus* conditions how they will work. This knowledge is built on the basis of comparative research, typification and theoretical model building and simulation. The thrust of this work is to create an inventory of general approaches to reconfigure governance together with a specification of performance characteristics and “instructions of use”. The professional identity is to build around the idea to improve policy making by allowing for learning across cases, accumulation and solidification of policy knowledge and making a rational choice from a repertoire of approaches possible.

“cosmopolitan institution building” (Grande 2006). What is highlighted here is the embedding of policy-making in a global socio-cognitive infrastructure of designing governance.⁶ Depending on the density and solidification of this infrastructure, clear guidelines for how to do policy and what counts as good design are firmly established and have a strong effect in structuring local reconfiguration work.

Division of design labour may be accompanied by the emergence of specialised organisations, interaction patterns and social institutions. One could call this the *social life of a policy instrument*. The emergence of a social constituency is integral to policy instruments. They are more than ideas, they are socio-cognitive phenomena. Concretely, designs on governance gather a social constituency, a community of actors who carry it forward by emphasising instrumentality. The constituency comprises actors who specialise on the working of the instrument and develop stakes in its retention, development, expansion and diffusion.⁷ This constituency of ‘instrument experts’ undergoes own processes of structuration and may bring up special organisations and institutions. Thus, it takes on independent social dynamics which become part of the overall process of governance change. Examples from the cases are first and foremost the carbon industry as a highly institutionalised constituency of emissions trading (that even takes on collective action capacities in lobbying for emissions trading). But also less institutionalised constituencies like the group that was the carrier of market-based environmental policy instruments in an earlier phase of the development of emissions trading (e.g. economists at the EPA) or the emerging regulatory sciences and networks of regulators in the case of network access regulation. An important conclusion from this is that policy instruments in their socio-cognitive appearance are all but passive tools. Especially in more mature states of development they may turn into vivid organisational fields, social entities by themselves with own dynamics and particular ways of engaging with policy processes on their own terms. This can go as far as the development of patterns of standardisation that ensure that local governance configurations correspond with cosmopolitan designs. Policy regimes, e.g. in the case of emissions trading, and of which the carbon industry is an important part, can now be seen as more than a framework, as a social entity with a particular orientation and interests, creating own dynamics. Since existence of specialised organisations and the overall structure of the regime receive legitimacy and resources through the existence of the particular instrument the collective interest of actors of the policy regime is to expand the application of the instrument, and possibly also to make it more sophisticated so that demand for specialised expertise is increased – in other words: extending the business field for specialised skills and competences. The carbon industry represents a social force in favour of strict environmental policy as

⁶ On the basis of studying the introduction of funded pensions in France (Palier 2007: 103) observes this phenomenon as follows: “Each country follows its own path in reforming its pensions system, but does so in a new shared landscape, structured by an overall model of a system where funded pensions play an increasing role.”

⁷ The notion of a constituency of policy instruments can be compared to concepts like epistemic community (Haas 1989) and regulatory community (Braithwaite, Drahos, 2000), but it differs in its focus on particular designs for governance. In both case studies a special type of actors comes up who have special expertise in relation to the governance model. These are policy analysts who know about the working of a model configuration because they have been involved in previous developments or because they dispose over modelling tools. In some cases experts may also include specialised service providers, like law firms, banks, consultancies or software developers who can offer to support the innovation process with their special capabilities or even ready-made elements of a new configuration such as contract templates, financing schemes, training modules, databases etc. comprise policy analysts in public administration, international organisations, think tanks and universities.

long as it increases the demand for its products and services and it develops a interest in securing and widening a domain for which it can claim a monopoly of competence. Emissions trading as a means of policy becomes an end in itself from the perspective of organisations within the policy regime. Policy regimes thus introduce trajectories to the dynamics of governance change which are oriented towards developing a particular policy instrument and extending the scope of its application.⁸

As *technical models* (of governance), policy instruments do a variety of things (and are thus much more than a technical model as such). They create promises by allowing for anticipation of possible future outcomes (often supported by modelling and simulation techniques). They also allow for the anticipation of roles and positions of actors in the future, i.e. a prospective governance structure. They do not only create promises with respect to common goods but also to individual benefits. By offering concrete articulations of prospective governance structures they can coordinate collective action for reconfiguring of de-facto governance within a particular domain. Policy instruments can be said to induce governance change by providing a vision of alternative modes of governance and their possible effects. They motivate design activity by constituting a productive illusion of political control, affirming the role of professional governing actors and supporting these actors in meeting the responsibilities that they are assigned.

For understanding how policy instruments work it is further important to consider the openness of prospective governance structures as embodied in technical models. Differently from problem definitions and policy goals, policy instruments have a more laminar and flexible character. They do not frame interaction by specifying an outcome but by specifying relations. Policy instruments do not require specification of a 'point agreement' (e.g. 30% greenhouse gas emission reductions by 2020), but can be effective on the basis of agreement on a general pattern (e.g. reducing emissions by allocating tradable allowances). With policy instruments as orientational frames the form of governance is foregrounded, and function remains implicit. This has two implications: For one, substantive parameters that determine the force and the scope of a policy remain open (e.g. the level of a cap on emissions, the level of network access charges). This leaves flexibility for nested negotiations once the instrument as a general structure is in place. Actors may therefore be ready to compromise on policy instruments more easily than on policy goals.⁹ Another implication of form rather than function being in the foreground is that policy instruments are more concrete than goals in laying out how roles of various actors may change. This is especially important for those actors who are not directly affected as regulatees or people affected by regulated activities, but who would have a role in implementing and maintaining a new governance

⁸ An interesting observation made in both cases, is that communities of policy professionals in their majority comprise private actors. In both cases, development of policy is 'contracted out' from public administration to private and partly commercially operating organisations like think tanks, consultancy firms, NGOs etc. Other than with command-and-control instruments, for example, development as well as operation of the instrument is not carried out within the public sector, by parliamentary working groups, ministries, special agencies etc., but by an army of private organisations performing as developers, implementers, mediators, verifiers, evaluators of policy. The special expertise that is needed to develop and operate complex policy instruments like emissions trading and open access to networks is to a large part vested with these private organisations.

⁹ A similar assessment is formulated by (Lascoumes, LeGalès 2007: 16) "Our hypothesis here is that the revival of these questions on public policy instrumentation may relate to the fact that actors find it easier to reach agreement on methods than goals - although what are instruments for some groups might be goals for others. Debates about instruments may offer a means of structuring a space for short-term exchanges, for negotiations and agreements, leaving aside the most problematic issues."

structure. Additional responsibilities may increase the scope of a government department, monitoring requirements may create new markets for providers of audit services or databases, shifting operational routines in industry may entail increased demand for consulting services, legal advice or private financing. The availability of cosmopolitan best practices enhances legitimacy of expertise in international organisations and gives them a role in dissemination, advice and benchmarking. All these examples illustrate how prospective governance structures may enrol a broad variety of different actors for a common reform project by raising different kinds of promises. The important thing is that policy instruments in this way create networks and coalitions of actors who do not necessarily need to support a single official policy goal and purpose, but who may each interpret the instrument from their particular perspective as an opportunity and thus become engaged with its realisation. In this way, by being open and concrete at the same time, policy instruments as technical models can be very effective in creating alliances for governance reforms. They shift focus in political debate on form instead of goal and function. This reduces potential political resistance, because the actual settings of instruments still remain flexible. And it entails possibilities to broaden support for policy reform, because it offers many options to enrol actors with specific assignments for and within the projected governance structure. One could call this the immediate politics of policy instruments as technical models.

The politics of policy instruments continue in the discursive realm. The articulation of policy instruments avoids mentioning of values and basic political beliefs. The discourse of policy instruments entails explicit distanciation from grand political orientations and ideologies such as left and right, liberal and conservative etc. Instead policy instruments build on allegedly neutral, often scientifically framed theories of human interaction and societal development and offer mechanisms by which interaction can be 'better' organised, regulation made 'more efficient' and development be steered 'more effectively'. As has been observed by many commentators, policy instruments can 'depoliticise' governance innovation (not because they are a-political, but because their politics are embedded and not immediately visible) and so are able to bridge political, especially ideological conflicts and overcome blockades to reform. Efficiency and effectiveness are abstract 'intermediate' goals that are used to assess how well policy instruments are capable of fulfilling a job. What kind of job it is, what the substantive policy goals are for which the instrument is used are secondary. Emissions trading, for example, is promoted under the slogan that it is the better instrument irrespective of the question whether a government wants to achieve high or low emission reductions. Likewise, network access regulation is said to be the modern way of regulating natural monopoly in a context of globalised markets and should best be placed completely out of reach of political interference, i.e. in the hands of independent regulatory agencies.

Such a technical framing of debates on governance has the effect to open room for manoeuvre in political negotiations between antagonistic camps. (Pierre, Peters, 2000: 43) call this the "efficacy of governing by stealth". It allows for pragmatic agreement on the basis of negotiations between parties who compete for votes on the basis of general political programmes. Debating governance reforms on technical terms avoids the blunt confrontation of antagonistic political values which can only be traded-off against each other. Thus, policy instruments can work to transform zero sum games in positive sum games. Thus, a specific productivity of policy instruments lies in the possibility for technical framing of policy development. It creates an 'apolitical space' where antagonists do not have to contest each other's standpoints out of principle.

The capacity of policy instruments to induce and coordinate reconfiguration processes is further supported by the technical orientation and language in which policy instruments are presented and

discussed. The technical character of policy instruments which is mirrored in referring to them as tools, techniques, or technologies, supports this effect by granting a special legitimacy to policy reform processes that refer to them. Besides bridging ideological conflict, the technical character of policy instruments shifts part of the responsibility for success and failure of political reform away from those responsible in a local context into a more impersonal realm of existing policy knowledge. If policy makers can refer to established models of governance which are globally traded, endorsed by international organisations like the OECD or even linked to working exemplars in other governance domains, reconfiguration projects appear less risky than if presented as self-made approaches. If they fail, part of the blame goes to a global “state of the art” (perhaps because it is not sufficiently developed) and only the blame for the workmanship in implementation stays with local policy makers.

Yet another effect of the ‘technologisation’ of policy-making through cosmopolitan models is linked to the development of special concepts and language. Participation in policy discourse thus requires learning the concepts and language. This introduces an entry threshold to the arena of debating governance reforms and stabilises the participation. This in turn facilitates the building of trust and other forms of social capital among actors who negotiate governance models on behalf on broader constituencies such as political parties, interest groups. They form an expert community. Agreement achieved within the expert community then enjoys technical legitimacy when defended in broader arenas and public debate.

In listing the nature and effects of the technical character of policy instruments, in particular how they are a “technical” model of governance, these last paragraphs may be read as getting off the subject by showing the advantages, and neglect discussing limitations, as the critics of technical rationality do. Such limitations and features that lead to them were visible in my discussion of instrumentality in governance and in the analysis of the cases. My purpose here was not to criticize in general terms, but to show what is happening in and around these designs on governance, with their so-called technical character. Better understanding of this aspect of the co-evolution of policy instruments and governance has itself a dual character: it can improve reflexivity and precaution and can offer instrumental knowledge about how to better pursue one’s interests.

Emphasizing the role of societal technology in governance and governance change, as I do here, also leads to more evaluative questions. There are basic ambivalences: technology increases productivity (here, of governance), while it also, and in the same movement, deprives people of control over their lives and causes unintended consequences which may offset productivity gains. These bring up the issue of implications of ‘technologisation’ of policy making for democratic control.

When there is a division of design labour, policy instruments are options developed in global expert networks, often by the use of theoretical models of society. These experts are not democratically accountable. Some are scientists and thus accountable within institutions of the science system. Others are interest group experts or commercially operating consultants who are not accountable for the content of their work, but only for success in offering their expertise on the market for policy advice. Within these professional networks specific dynamics emerge that follow a technological and commercial rationality rather than a political one. Instrument development and competition between established instruments and innovations may be driven by interests of producers rather than users and other actors affected by their impact upon application. These dynamics that shape policy development are detached from the contexts of implementation.

These arenas of policy development are not apolitical, though. They are not isolated from influence by political interests. The more influential policy instruments become as designs on governance, the more social science and policy analysis becomes a part of governance - and with it a battleground for politics. Professionalised policy development may take on dynamics of its own. It becomes concentrated in global laboratory infrastructures, detached from users and contexts of application. Policy developers may become specialised on particular instruments and accrue stakes in their development and diffusion because it increases the relevance of their expertise and demand for their services. As such, it becomes more difficult to maintain accountability.

Policy instruments partake in the general ideology of instrumentality when they become legitimised and immunised against political critique by positioning them as universal mechanisms that lie hidden in nature, are to be discovered and retrieved by scientific analysis and made available for the fulfilment of human purposes (e.g. Bunge, 1998). My own point here has been that they are then deprived of their social nature, and become static rather than constructed and reconstructed all the time. Still, technology development becomes legitimised with respect to neutral concepts of progress, thereby immunised against criticism of purpose or effect. As Lascoumes and LeGalès phrase it: "For government élites, the debate on instruments may be a useful smokescreen to hide less respectable objectives, to depoliticize fundamentally political issues, to create a minimum consensus on reform by relying on the apparent neutrality of instruments presented as modern, whose actual effects are felt permanently" (Lascoumes, LeGalès 2007: 17). Rather than blaming instruments and their instrumentality for it, I have emphasized the construction and social life of instruments, so that blame falls on the whole process and its patterns and configurations.

Finally, there is the question of effectiveness - and its ambivalence. Policy instruments as designs on governance exist in isolation of specific governance contexts. They are 'cosmopolitan' models of governing which are made available for global transfer. They contain operational principles, blueprints, and instructions for installation and use for institutional configurations which can be expected to work in a specified way. In order to make policy knowledge relevant for various contexts and situations specific policy goals, cultural values, institutional contexts of implementation are stripped off so that what remains can be seen as the technical core of policy.

Institutions designed elsewhere do not necessarily find acceptance and work. This is the topic of implementation research. The creation and development of models that serve as globally transferable designs for configurations of governance is comparable to the development and implementation of artefacts. In the case of policy instruments they are institutional artefacts. These are by their very nature not transferable as a whole internally aligned system with a determined function, but need to be built anew in each context of implementation. Actors and practices that form the 'raw material' for institutional artefacts are embedded in contexts; they would change their behaviour, if located within another context. More importantly, the purpose of policy instruments would be missed, if the people to which they apply would be taken with the instrument to other contexts of implementation. What they are expected to do is to modify the interaction of people in the relevant governance domain. Nevertheless, the way in which policy instruments are articulated often do not give regard to the specificities of actors and contexts, but use general models of man (e.g. homo oeconomicus) and idealised contexts.

It is a specific arrangement of rules that is understood to make a policy instrument. These are often transferred almost in identical language from one implementation site to another one. In the course of this process the design starts to interact with actors and institutions in particular contexts of implementation

and co-evolves with them. One possibility is that the design goes local, becomes adapted, replenished, enhanced in order to make do with what is there. Another possibility is that the rules embedded in the global design are forced on the local context. In so far as these rules (together with idealised actors and contexts) constitute a coherent system of interaction they can indeed be compared with technological artefacts that (together with idealised users and contexts) produce a new and reliable outcome. In the extreme case the link between development and implementation is reduced to the choice of a particular design from a global repertoire which is then used as a model to reconfigure governance patterns within the domain of application. Apart from the ubiquitous offer of allegedly 'ready made' solutions, 'self-made' policy designs become more difficult to legitimise. For policy makers they entail a greater risk of failure being attributed to the responsibility of those who promoted it, whereas failure of standard models can be blamed on the general state of policy knowledge.

5 Application of insights to governance for sustainable energy systems

Can the insights drawn from the two cases studied be expected to be valid also for other policy instruments and innovation processes in governance? The two instruments are special in certain respects. Both instruments are (by now) based on economic theories, address business interactions, and their career was linked to a strong neo-liberal agenda of regulatory reform.

There is definitely more general validity to the approach, i.e. to use innovation patterns and innovation journeys to capture the dynamics of co-evolution between innovation journey and governance dynamics. Particular patterns are pronounced in the two cases, but the approach also allows adaptations and modifications. Innovation journeys might be more complex – interlaced, diffuse, interrupted, disappearing – and therefore less easy to follow. Further development of the conceptual repertoire and analytical methods is possible which still remains within the framework of co-evolution of instruments with problems and authority, the double-life of policy instruments and globalised innovation in technological regimes.

For other than economic instruments, I would argue that insights on the co-evolution of instruments and governance dynamics remain valid. They may well be more complex, especially when the model of governance is itself related to an overarching worldview that gives preference for particular types of approaches (cf. neo-liberal ideology in the case of network access regulation). A case in point would be instruments like 'covenants' as negotiated voluntary agreements in which societal actors (like industrial associations) commit themselves towards government to take over responsibility for implementation and monitoring of policy goals within a sector or domain. A further case would be the family of instruments that go under headings such as "interactive", "participation", "deliberation", "dialogue", "discourse". Specific instruments would be "Planungszelle", "citizen dialogue", "citizen technology panels", "interactive technology assessment", "constructive technology assessment", "sustainability foresight". The policy approaches are based on quite different models of society and theoretical assumptions than with economic instruments. Yet, there are also patterns here of cosmopolitanisation and formation of a global design community in which general models become developed, circulated, compared and assessed. It will be repertoire learning in a gradually emerging field of expertise and building blocks, rather than a breakthrough of one dominant design. The experiments in participatory democracy science in the 1970s were led by political enthusiasm, but by now, there is also a more instrumental view, and thus

solidification of certain designs and beginnings of innovation journeys. Co-evolution leading to changes in governance may become visible already, not just in the use (some would say, abuse) of participatory governance models instrumentally to improve legitimation, but also in shifts of what ‘participatory’ can and should mean.

Another example in which views on society and attempts to find solutions to problems interact in a diffuse and heterogeneous way involves the issue of sustainability and governance approaches. A nascent policy instrument “transition management” is particularly interesting, which is articulated in the context (protected space) of Dutch environmental and innovation policy. The basic operational principle is to set up “transition arenas” in which diverse stakeholders from a sector like energy or agriculture develop a vision of a sustainable future, use backcasting approaches to identify possible socio-technical paths that could lead there and conduct and evaluate experiments to explore the viability of each of the paths in practice and in an iterated process adapt the long term vision and agenda for real world experimentation with options. Here, the roots are practices of “sustainable technology development” and “covenants” for environmental policy in the Netherlands as well as theories of complex adaptive systems and respective concepts of adaptive management, foresight methods and innovation studies and strategic niche management. First developments towards a working configuration of transition management policy in practice are currently under way in the Netherlands. This is a process in which the model and real world configurations interact. At the same time, the model circulates, is picked up elsewhere, recombined and adapted in other policy contexts and may give rise to a global design community.

6 Strategies for innovating governance for sustainable energy

After all these critical evaluations of instrumentality of policy instruments as societal technology of governance, I should come back to my overall perspective on innovation in governance and the role of design and dynamics. What happens if I attempt to translate the into advice on specific orientations for political strategies to modify governance patterns, especially in energy systems?

I will now get into the role of the designer – albeit a reflexive designer, work from within the productive illusion and transcend it at the same time. How to make sure that a productive illusion, from a broader governance perspective, does not turn counterproductive? This can, of course, not be guaranteed. Still, there are two main strategies to follow to be somewhat productive - also in light of the dynamics in which design is embedded.

One is to embrace instrumentality of policy instruments while knowing about its role and its limitations. This would entail an affirmative approach to the instrumentality of policy instruments: engage in their development and use to achieve at least some desirable goals, knowing that there are costs in terms of unintended effects and possibly a loss of democratic control involved.

The other is to embrace ongoing dynamics, and not strive to devise universal solutions to control them. This does not need to mean to just follow whatever happens. The strategy is to go for open-ended processes (innovation, modulation) rather than optimal instruments, ‘best practice’, and comprehensively designed reform projects. This could be called a reflexive innovation strategy for new (sustainable) modes of governance. Some elements of such a strategy would be:

One obvious example is to induce knowledge creation and have a variety of actors experiment with different solutions, and support the emergence of a repertoire. A problem is with the notion of experiment as a site to learn. Where in governance can experiments be carried out? On the local level, but

then the learning may be locally specific. There are many experiments in innovating governance, for example in cities, and there is, by now, a large literature. My dynamics perspective has nothing else to add than insisting on the recognition of co-evolutionary processes, and realizing that transcending the local is not just a matter of ideas that travel and are picked up, somehow, elsewhere.

More centrally related to the dynamics perspective is the need to diagnose dynamics in terms of what they might enable or constrain, and act on that basis. Thus, for example, investigation of actual inducement mechanism and blocking mechanisms for the development of momentum in specific governance paths. As (March, Olsen, 1989) say: “a solution that is persistently available is likely to find an occasion. The implication is that governance becomes less a matter of engineering than of gardening (Szanton 1981: 24); less a matter of hunting than gathering.”

I would add the monitoring of ongoing change, and the development of scenarios articulating possible prospective governance structures.

Constructive assessment is the next step. Including broader impact assessment e.g. with respect to the effects of new policy tools on democracy (instead of effectiveness and efficiency) (Schneider, Ingram 1990).

References

- Baron, R. and Philibert, C. 2005, *Act locally, trade globally. Emissions Trading for Climate Policy*, Paris: OECD.
- Bender, G. 2007. Wechselwirkung zwischen Technik und institutionellen Strukturen versus Technologieentwicklung als Institutionalisierungsprozess. In *Gesellschaft und die Macht der Technik. Sozio-ökonomischer und institutioneller Wandel durch Technisierung*, eds. Dolata, U., Werle, R., pp. 45-62, Frankfurt am Main, New York: Campus.
- Black, J. 2005. What is regulatory innovation? In *Regulatory Innovation*, eds. Black, J., Lodge, M., Thatcher, M., pp. 1-15, Cheltenham: Edward Elgar.
- Bunge, M. 1998, *Social Science under Debate. A philosophical perspective*, Toronto: University of Toronto Press.
- Cohen, M.D., March, J.G., Olsen, J.P. 1972. A garbage can model of organizational choice. *Administrative Science Quarterly* 17, pp. 1-25
- Dales, J.H. 1968, *Pollution, Property, and Prices*, Toronto: Toronto University Press.
- Disco, C., van der Meulen, B. (eds.) 1998 *Getting New Technologies Together. Studies in Making Sociotechnical Order*. Berlin: Walter de Gruyter
- Eberlein, B., Grande, E. 2005. Beyond delegation: transnational regulatory regimes and the EU regulatory state. *Journal of European Public Policy* 12 (1), pp. 89-112
- Garud, R., Karnoe, P. 2002. Bricolage versus breakthrough: Distributed and embedded agency in technology entrepreneurship. *Research Policy* 32, pp. 227-300
- Goodin, R.E. (ed.) 1998/1996. *The theory of institutional design*. Cambridge: Cambridge Univ. Press (first published 1996)
- Kingdon, J.W. 2003/1995, *Agendas, Alternatives, and Public Policies*, New York et al.: Addison-Wesley Educational Publishers Inc.

- Lascoumes, P., LeGalès, P. 2007. Introduction: Understanding Public Policy through Its Instruments - From the Nature of Instruments to the Sociology of Public Policy Instrumentation. *Governance: An International Journal of Policy, Administration, and Institutions* 20 (1), pp. 1-21
- Latour, B. 1992. Where are the missing masses? The sociology of a few mundane artifacts. In *Shaping Technology/ Building Society. Studies in Sociotechnical Change* , eds. Bijker, W.E., Law, J., pp. 225-258, Cambridge: MIT Press.
- March, J.G. and Olsen, J.P. 1989, *Rediscovering Institutions: The Organizational Basis of Politics*, New York: Free Press.
- Mayntz, R. 1997/1983. The Conditions of Effective Public Policy. In *Soziale Dynamik und politische Steuerung: theoretische und methodologische Überlegungen* , eds. Mayntz, R., pp. 143-167, Frankfurt, New York: Campus (first published 1983).
- Olsen, J.P. 1997. Institutional Design in Democratic Contexts. *The Journal of Political Philosophy* 5 (3), pp. 203-229
- Palier, B. 2007. Tracking the Evolution of a Single Instrument Can Reveal Profound Changes: The Case of Funded Pensions in France. *Governance: An International Journal of Policy, Administration, and Institutions* 20 (1), pp. 85-107
- Pinch, T.J., Bijker, W.E. 1987. The social construction of facts and artifacts: or how the sociology of science and the sociology of technology might benefit each other. In *The social construction of technological systems* , eds. Bijker, W.E., Hughes, T.P., Pinch, T.J., pp. 17-50, Cambridge: MIT Press.
- Polsby, N.W. 1984, *Political Innovation in America. The Politics of Policy Initiation*, New Haven, London: Yale University Press.
- Prittwitz, V.v. 1990, *Das Katastrophenparadox. Elemente einer Theorie der Umweltpolitik*, Opladen: Leske+Budrich.
- Rip, A. 1995. Introduction of New Technology: Making Use of Recent Insights from Sociology and Economics of Technology. *Technology Analysis & Strategic Management* 7 (4), pp. 417-431
- Rip, A., Kemp, R. 1998. Technological Change. In *Human Choice and Climate Change* , eds. Rayner, S., Malone, E.L., pp. 327-399, Columbus, Ohio: Batelle Press.
- Rip, A., Schot, J.P. 1999. Anticipating on Contextualization - Loci for Influencing the Dynamics of Technological Development. In *Paradoxien der Innovation. Perspektiven sozialwissenschaftlicher Innovationsforschung* , eds. Sauer, D., Lang, C., pp. 129-148, Frankfurt, New York: Campus.
- Rip, A., Schot, J.W. 2001. Identifying Loci for Influencing the Dynamics of Technological Development. In *Shaping Technology, Guiding Policy. Concepts, Spaces and Tools* , eds. Sorensen, K.H., Williams, R., pp. 155-172, Cheltenham: Edward Elgar.
- Schneider, A., Ingram, H. 1990. Behavioral Assumptions of Policy Tools. *The Journal of Politics* 52 (2), pp. 510-529
- Tietenberg, T.H. 1985, *Emissions Trading. An exercise in reforming pollution policy*, Washington, DC: Resources for the Future.
- van Lente, H. 1993, *Promising technologies: The dynamics of expectations in technological development*, Enschede: Twente University Press.

- Voß, J.-P., Bauknecht, D., Kemp, R. (eds.) 2006 *Reflexive Governance for Sustainable Development*. Cheltenham: Edward Elgar
- Weimer, D.L. 1992. The Craft of Policy Design: Can It Be More Than Art? *Policy Studies Review* 11 (3/4), pp. 370-388
- Wettestad, J. 2005. The Making of the 2003 EU Emissions Trading Directive: An Ultra-Quick Process due to Entrepreneurial Efficiency? *Global Environmental Politics* 5 (1), pp. 1-23