Designs on governance

Development of policy instruments and dynamics in governance

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Preface

'Designs on governance' concern the self-modulation of society. This sounds like a big thing. As far as I am concerned, it *is* a big thing. Although policy instruments, the topic of this book, appear quite technical at first sight, they are entrance points to fundamental questions of governance and social change. They reflect a duality of social process as captured in pairs of terms like design & dynamics, management & politics or planning & (co-)evolution.

On the one hand, policy instruments are tools for governments to work towards desired effects. As such they carry labels like 'emissions trading' or 'network access regulation' (to mention two that are studied later in this book). They should have articulated functions and predictable effects. Talk is about parameters, performance and standards. Images show boxes, arrows and intersecting curves (or token actors as on this book's cover). On the other hand, policy instruments is what happens in society where social interaction and ongoing dynamics contribute their part to the creation of social order. Here, emissions trading is also a monstruous institutional patchwork, a mushrooming consulting industry and the erosion of environmental morality. Network access regulation is also institutional power struggles, cut off utility customers and protesting workers (as on this book's cover-background).

Investigating the 'double-life' of policy instruments enhances a reflexive perspective on governance in which governing practice are analysed as embedded in broader co-evolutionary dynamics of change. While policy instruments' promise of control is an illusion, it appears as a productive one that can shape political action. Policy instruments thus are effective in societal development – if only in different ways than promised. Some steps along this line of analysis can be followed on the coming pages.

This book is not just the result of a research project concluded. It is also part of a journey of intellectual reflection. Part of the journey was my early and continuing wonderment about how patterns of human interaction, and social reality more broadly, are taken for granted. In my last years at school and as a student I was politically engaged. I studied political science and economics to find out how society could be changed for the better. University studies offered insights and at the same time nurtured doubts about the possibility of change and the substance of 'better'. A few years of professional policy analysis contributed their bit. Ambivalence, contestedness and dynamics moved into the foreground and I became concerned with governance as a continuous process embedded in ongoing changes, rather than with delimitable projects of problem-solving. "Reflexive Governance for Sustainable Development" (Voß et al., 2006a) was a first attempt at articulating interactive societal learning as a governance mode to cope with this condition. Linked to this were practical experi-

ments with ‘sustainability foresight’ as a concrete design – and the realisation how radically different the envisioned learning oriented practices are from the daily practices of participating stakeholders. This gave rise to the topic of innovation in governance: How do novel policy practices become established in the context of existing patterns of governance? Already working on the dynamics of innovation in technological regimes (in energy production and use) it was a small step to also see innovation journeys in governance. A larger step was to find the appropriate unit of analysis. It took some time to depart from a focus on policy domains and instead follow the instruments as they evolve. At this point, the thesis developed a life of its own. More conceptual work was required to analytically bring to bear the ‘new’ phenomenon of innovation journeys in governance and empirical cases had to be picked that allowed for learning more. An intermediate result is this book. The intellectual journey will – hopefully – continue, with further twists and turns, in the coming years.

Like any other journey this one is embedded in broader contexts and was shaped in interactive processes. I am grateful for inspiration and support by many colleagues, friends and others who crossed my way. Above all, there is Arie Rip who shaped the emerging thesis in many roles, as intellectual sparrings partner, experienced coach, sympathising friend and not least as academic supervisor. With him I could follow intellectual curiosity and explore wide fields of reflection with insights that often enough overflew the framework of a thesis. At the same time he was invaluable in urging me to keep sight of the envisoned product and giving advise on how to repair when the framework became undermined and parts of it washed away in ongoing research work and thinking. Maarten Arentsen in his role as second supervisor worked in the most supportive way by going with me in my fascination for the project and being my living conscience regarding the accessability of my writing and scouring for main lines of argumentation and steadily pressing for clarity in presentation. At the University of Twente the Institute for Governance Studies granted access to facilities and provided several opportunities to discuss my work with colleagues.

In addition to my immediate academic environment at the University of Twente the journey of the thesis was shaped by prior and ongoing work at the Öko-Institut, an independent think tank for environmental policy in Germany. Over the last eight years I enjoyed a most amenable working environment with a good sense for entrepreneurial spirit and normative commitment and had the chance to learn the practice of policy analysis and advice. Many ideas for the thesis were born from this experience. With Franziska Wolff and Dierk Bauknecht I shared my interest for the more theoretical questions of governance. An important context for my work on the thesis was an interdisciplinary research group on ‘Transformation and Innovation in Power Systems’ of which the PhD

project was a part. Martin Cames, Corinna Fischer, Martin Pehnt, Barbara Prätorius, Lambert Schneider and Katja Schumacher were friendly and inspiring partners in this endeveavour. At this point it is also in place to gratefully acknowledge the funding of this group by the German Federal Ministry for Education and Research through its profoundly conceptualised and truly reflexively managed programme of Social-ecological Research.

At different stages in the process several instiutes have provided at the same time stimulating and shielding environments for my work on the thesis as a visiting researcher. My time with the Science and Technology Policy Research Unit (SPRU) at the University of Sussex in Brighton was made particularly fruitful by interaction with Adrian Smith, Steve Sorrell, Andy Stirling, Florian Kern and René Kemp. At the European University Institute in Florence I received valuable comments on my work from Mark Thatcher, Burkhard Eberlein, Adrienne Héritier, Manuele Citi, Jan Zutavern, Eva Heidbreder, Anja Röcke, Rikard Stankiewicz, Peter Mair and Mark Franklin. In terms of non-human interaction, I owe credits to the strict linings of classical gardens of villa Schifanoia which over and again assisted me in creating order in my thinking about the complex and messy reality of governance.

Troughout the time I worked on the thesis I had the opportunity to present preliminary parts of the study at several workshops. I thank Renate Mayntz, Raymund Werle and Ulrich Dolata for comments at a workshop at the Max-Planck Institute for the Study of Societies in Cologne; Volker Schneider, Harald Rohracher and Atle Midttun for comments on the developemt of my work at the occasion of several meetings of the advisory board to the TIPS project; Staffan Jacobsson, Bernhard Truffer and Matthias Weber for comments at the occasion of a presentation at the Conference of the European Association for the Study of Science and Technology in Lausanne; Jan Strobel and Johannes Weyer for discussion of ideas I presented at a workshop organised by the graduate school "Paths of Organisational Processes" at the Free University of Berlin.

Last but not least I acknowledge valuable last minute comments by Philipp Späth and excellent editorial support by Vanessa Cook and Johanna Cludius.

Of course, there were even many more people involved in one way or the other. And I did not even try to mention perhaps even most important non-professional interaction with friends and family. That's how it is… for the moment.

Jan-Peter Voß

Berlin in September 2007

1 Introduction

The career of 'policy instruments' in political practice seems paradoxical. On the one hand, the concept is criticised for misrepresenting the complex and contested reality of policy-making and becomes exposed as rhetoric which objectifies the genuinely political character of policy. On the other hand, policy instruments play an increasingly central role in political debate and the design of political action programmes. As an attempt to accommodate this apparent paradox, I look at policy instruments in a new way as 'designs on governance'.

A key concern of the social sciences is the capacities of humans to determine their own destiny. Social science research revolves around the question of social order and how it can be shaped. Linked to this is a concern for possibilities of design, of modification and steering, of changing the world or giving direction to its development according to ideas of how it could be better. This is a question of governance. Since the early days of social and political science, thinking about governance is characterised by a polarisation of two fundamental positions on the question of "To what extent forms of government are a matter of choice" as John Stuart Mill formulates it. Indeed he articulates it so well that I will let him introduce the topic for this thesis some 150 years later (Mill, 1862: 12):

> *"All speculations concerning forms of government bear the impress, more or less exclusive, of two conflicting theories respecting political institutions; or, to speak more properly, conflicting conceptions of what political institutions are.*
>
> *By some minds, government is conceived as strictly a practical art, giving rise to no questions but those of means and an end. Forms of government are assimilated to any other expedients for the attainment of human objects. They are regarded as wholly an affair of invention and contrivance. Being made by man, it is assumed that man has the choice either to make them or not, and how or on what pattern they shall be made. (...) To find the best form of government, to persuade others that it is the best; and, having done so, to stir them up to insist on having it, is the order of ideas in the minds of those who adopt this view of political philosophy. They look upon a constitution in the same light (difference of scale being allowed for) as they would upon a steam plow or a threshing machine.*
>
> *To these stand opposed another kind of political reasoners, who are so far from assimilating a form of government to a machine that they regard it as a sort of spontaneous product, and the science of government as a branch (so to speak) of natural history.*

> *According to them, forms of government are not a matter of choice. We must take them, in the main, as we find them. Governments can not be constructed by premeditated design. They "are not made, but grow". Our business with them, as with the other facts of the universe, is to acquaint ourselves with their natural properties, and adapt ourselves to them. The fundamental political institutions of a people are considered by this school as a sort of organic growth from the nature of life of that people; a product of their habits, instincts, and unconscious wants and desires, scarcely at all of their deliberate purposes. Their will has had no part in the matter but that of meeting the necessities of the moment by the contrivances of the moment (...).*
>
> *It is difficult to decide which of these doctrines would be the most absurd, if we suppose either of them held as an exclusive theory. But, though each side greatly exaggerates its own theory, out of opposition to the other, and no one holds without modification to either, the two doctrines correspond to a deep-seated difference between two modes of thought; and though it is evident that neither of these is entirely in the right, yet it being equally evident that neither is wholly in the wrong, we must endeavour to get down to what is at the root of each, and avail ourselves of the amount of truth which exists in either."*

My thesis is about this tension between "design and dynamics in governance" as I call it. For some time during the last century the design perspective gained dominance with the idea of government as a unitary, hierarchical steering centre through which society could be moulded according to political will (generated through democratic procedure). The dominance of the design view, however, has vanished over the last quarter of a century or so. The notion of governance came to substitute the notion of government and referred to an erosion of central control capacities and diffusion of political steering within and across society (levels, subsectors). In consequence, social order came to be conceived of once again as a result of overlapping procedures, interfering strategies, distributed actions much more than a result of government's (or whoever else's) design. Notions such as complexity, self-organisation, (co-)evolution, and emergent dynamics became re-established in political thought. At the same time, however, the design perspective remained and in some respects became even more forceful. This is primarily the case in policy analysis and political debate. Professional civil servants and policy makers, and those who counsel them, find it difficult to embrace a perspective that would render their activities futile. In the institutional set-up of modern democracy they are held responsible for what

they do. This is what they are appointed or elected for. Governance, from this perspective, is perceived as a new challenge for design and steering, but not as its annulment.

The cleavage between design and dynamics is most explicit in debates on policy instruments. That is a reason to focus on policy instruments, in addition to their interest as such. Policy instruments embody a promise of design and control of societal developments. This promise has been refuted in theory and led to disappointment in practice. Nevertheless, policy instruments are rising in importance in political debate and practical thinking. How can we make sense of this seeming paradox?

The promise of policy instruments is that political steering of societal development is something that can be developed and improved similar to the way in which human mastery of nature has been developed and improved through the development of technology. Political debate is increasingly centering on policy instruments, on technical approaches of how to do policy, rather than basic beliefs and grand alternatives with regard to the ends for which policy is done. Instruments are said to be a driving force towards more sophisticated forms of governance: "actual public problem solving has come to embrace the collaborative actions of governments at multiple levels and both government and private institutions. The vehicle for this has been the development and widespread adoption of a host of alternative instruments" (Salamon, 2002a: vii). Governance change is to a large degree a battle on the grounds of effectiveness and practicality in solving problems. Current political debates are about pros and cons of instruments. These instruments go under labels such as labour market activation, funded pensions, corporate social responsibility, emissions trading, network access regulation, voluntary agreements, open method of coordination.

Policy instruments are a promising research site for the study of governance, because of their paradoxical nature, conceptual contestedness, and seeming mismatch with more general theories of governance. This indicates some more fundamental inconsistencies in our understanding of governance. I make policy instruments a topic of study to better understand their relation to governance dynamics. A starting point for this is an in-depth discussion of dynamics and design in governance and a closer look at policy instruments. What is behind the notion of policy instruments, if the metaphor of tools and the veil of technicality that comes with it are lifted?

In addition, there is the emergence of policy instruments and the question of whether they have emergent dynamics of their own. The dynamics of policy instruments interact with broader dynamics of governance. In both, dynamics of policy instruments and broader governance dynamics, design is deeply embedded. Without design, dynamics would not occur. But neither can dynamics be

explained by design. Both are related in multiple ways in recursive relationships over several domains and levels. One challenge therefore is to specify these relationships and work out the different patterns in which they unfold.

I develop my argument and analysis in several steps. First, I address some fundamentals of societal change by developing a reflexive perspective of governance (Chapter 2). This is necessary because current thinking on governance as it appears in the literature still shows a gap between polar views foregrounding either design or dynamics. Their entanglement is the important question, but it lacks conceptualisation in the relevant literature. I develop a perspective of three grades of structuration, expanding on Giddens' use of the notion, which captures design as embedded in dynamics and dynamics springing from design. Interpreting public policy and governance in this framework should produce first clues on how to deal with the conundrum of policy instruments. They can be positioned as designs on governance and are part and parcel of a productive illusion of control that guides political action.

In a second step I explore the two-sided instrumentality that is suggested by the notion of design on governance and its tension with a reflexive perspective of governance (Chapter 3). To prepare for this, I reconstruct the evolution of questions, concepts and assessments in political science research on policy instruments. This shows a gradual opening of the black-box created by a metaphor of '(mechanical) tools' and associated break-up of the technicality of policy instruments while at the same time technical notions and instrumental research perspectives persist and are carried forward. The paradox of instrumentality of policy instruments is thus reflected in the academic literature. Building on the academic discussion of policy instruments, I can propose a specification of the notion of design on governance into a concept of policy instruments that comprises two dimensions: actual configurations in governance that are an outcome of the application of policy instruments and models of governance which frame such reconfiguration work. Together, these two dimensions imply a double-life of policy instruments. In this conception it is exactly the tension between model design and (what I will call) configurational dynamics which gives rise to a specific form of productivity in public policy. It produces desired as well as undesired outcomes and it gives rise to specific trajectories in the development of governance patterns. Thus, new empirical research approaches to follow the development of policy instruments across various instances of implementation appear to be required.

Based on the conceptual repositioning of policy instruments I develop an analytical framework for empirical analysis (Chapter 4). Scanning policy studies literature brings up a few building blocks for the analysis of developmental dynamics of policy instruments, but shows a lack of concepts that could be used for following policy instruments along the course of their development. Think-

ing of policy instruments as 'societal technologies' leads me to selectively employ concepts from studies of technological innovation. The concept of innovation journey will be used heuristically to depict development processes towards a new policy instrument as a sequence of critical transitions between phases leading, in the end, into the formation of a specific 'technological regime'. Such innovation journeys of policy instruments are not independent from broader dynamics of governance, and a way to accommodate this is to make it part of an adapted version of the multiple-stream model of the policy process. Depending whether the design/innovation stream or the governance stream take the lead, 'design push' and 'dynamics pull' will be two contrasting patterns, and these will provide a vantage point for empirical case studies.

As an intermediary step towards case studies, I present the research design, including methodology and selection of cases in Chapter 5. I briefly present two cases that are chosen to match the two ideal-typical innovation patterns: 'Emissions trading' as a policy instruments with a fully fledged innovation journey dominating governance dynamics in an overall pattern of 'design push'. And 'network access in utilities' as a second case in which a policy instrument develops in a 'dynamics pull' pattern where the course of the innovation journey is dominated by broader dynamics of governance.

Two empirical chapters (Chapter 6 and 7) present case studies of the development of emissions trading and network access regulation, respectively. For each case I reconstruct the innovation journey by looking for origins and tracking the sequence of events in which designs unfolded and stabilised. The cases show some interesting matches and allow for filling in conceptual propositions, but also interesting variation and differences that provide additional insights.

I conclude the thesis with a discussion of the double life of policy instruments in innovation journeys and patterns of development in the case studies (Chapter 8). Here, I also present additional key findings and move on to broadly discuss further thoughts and research.

2 Design and dynamics in governance

2.1 Introduction

Coming to terms with policy instruments as elements in real world governance requires dealing with foundational questions. How does the instrumental rationality and problem-solving view on public policy that is at the heart of the approach in terms of policy instruments relate to the complexities of governance and societal change?

Present-day society is often depicted as polycentered, heterarchic, fragmented, differentiated, multi-level and multi-dimensional and change is portrayed as complex, self-organising, co-evolutionary, emergent. Policy instruments, on the other hand, contain an image of society as being at the disposal of policy makers, as an object "out there", amenable to technical reconfiguration and control. Actual discussion of public policy and governance might well reveal facets of both, of an actor-centred design perspective and of a reflexive system-oriented perspective on institutional dynamics. But how do they go together? Or as I will put it, what is the relation between design and dynamics in governance? This question will be addressed as such as well as to prepare the basis for my investigation into the nature and working of policy instruments.

This chapter starts with a review of the governance literature which indicates dynamics and design as two perspectives which appear to live in their own worlds. It is either intentional action or (co-)evolutionary dynamics that is to be at the heart of understanding the patterning of social interaction and direction of societal development. This tendency in social research to specialise in either one of these perspectives creates shortcomings: overestimation of control capacities in the design perspective and a lack of strategic relevance in the dynamics perspective. The possibility of a (dialectical) combination of these two polar perspectives on governance is neglected (Czada, Schimank, 2000: 24).

How can governance be understood in a way that combines dynamics and design? Such a combination must relate to the foundational discussion of structure versus agency, and system versus actor perspectives. Giddens' concept of structuration (Giddens, 1986/1984) bridges the polar perspectives, and I will build on this concept and extend it by articulating a reflexive view on the design activities of social actors as part of and embedded in systemic dynamics of change.

Public policy, with its interest in policy instruments as tools, refers to publicly oriented steering and design activities (by state and non-state actors), but will now be positioned as embedded in larger dynamics, and conditioned and shaped by them. The concept of governance captures this broader dynamics, but

for a full analysis the concept should be broadened further, and refer to the patterns and structural dynamics in which (parts of) society are regulated. Instrumental approaches to public policy and steering might then dissolve and be no more than one strand in the overall dynamics. But this is not the whole story. Even if political steering of society from some vantage point is an illusion, it is also a productive illusion. Changes will be introduced, and while the intentions of policy makers and goals of steering attempts may not be achieved, there will be effects. This is how I will re-conceptualise policy instruments as 'designs on governance'. On the one hand, they guide public policy by the promise of control. On the other hand, their effects depend on how they become inserted in ongoing dynamics. But there is a "third" hand as well: policy instruments have a life of their own, so they are not just tools to be mobilised by policy makers according to their whim, and neither are they just part of the vicissitudes of overall dynamics. This "third hand" is discussed in sections 2.4.2 and 2.5, and prepares the ground for a critical evaluation of the policy instruments literature in Chapter 3.

2.2 The emerging concept of governance

Governance is a fashionable concept with various meanings.[1] I focus on two poles in the literature on governance. These relate to a fundamental ambiguity in thinking about society: taking an actor (agency) or a system (structure) perspective. Olsen (1997: 203-204), referring to Mill (1862), distinguishes two traditions of political thought: "One was interpreting change instrumentally, as a matter of social engineering and choice between alternative arrangements. The other was viewing change as the outcome of organic, evolutionary processes." Clearly, the role of policy instruments in governance will be viewed differently in the two traditions.

The spreading of the notion of governance is connected with two interlinked developments that culminated in the 1980s, one scholarly and one political. In the social sciences the rise of neo-institutional approaches provided a basis for overcoming a long-standing dichotomy of agency and structure based theories, and thus opened views for dynamic and diverse patterns of regulation

[1] Rhodes (1997: 47) distinguishes six separate uses of governance "as the minimal state, as corporate governance, as the new public management, as 'good governance', as a socio-cybernetic system, as self-organizing networks". Pierre and Peters (2000) distinguish the use for phenomena such as policy networks, public management, coordination of sectors of the economy, public-private partnerships, corporate governance.

beyond the alleged anarchy of the market and hierarchy of the state.[2] The political development at that time can be characterised by a growing perception of an erosion of governing capabilities with the state and loss of a legitimacy of state interventions. This was related to setbacks to heroic Keynesian welfare policy, economic performance problems linked to the oil crisis, emerging social movements for peace and the environment, and incipient internationalisation in, for example, the context of European integration, throughout the 1970s and later. Rising criticism of the strong role of the state as master and steering centre of society helped making alternative conceptions more credible which identified potential sources of order in societal (for a large part economic) self-organisation and cooperative and "soft" forms of interaction between state and society such as negotiated agreements and information and consultation.

In this way, one can position developments in economics and political science like neo-institutionalist approaches (Williamson, 1985; March, Olsen, 1989) which established a real alternative to individualistic rational choice approaches that dominated these fields in the 1960s and 1970s. In sociology, rational choice never gained such dominance, so that the rediscovery of institutions in economics and political science could also be seen as a sociologisation of the social sciences. These approaches established a new research interest in formal and informal rule systems and broadened the view for various different arrangements of social regulation apart from the simple dichotomy of state and market.

The economics engagement with governance generally follows the idea of "assessing the efficacy of alternative modes (means) of organisation".[3] The

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[2] Some influence may also have come from theories of complexity and self-organisation (Prigogine, Stengers, 1984; Aida, 1985; Loye, Eisler 1987; Waldrop, 1992).

[3] In economics (where the origins of the academic use of governance can be found (Benz, 2004: 15-16)) governance is used to demarcate a departure from a narrow focus on competition in idealised market settings and introduces a comparative perspective on different forms in which economic activity can (and should) be organised, including contractual networks, associations and hierarchies (Williamson, 1985). Lindberg et al. (1991: 3) refer to governance as "institutions that govern economic activity", "political and economic processes that coordinate activity among economic actors" and "common institutional forms of governance, or governance mechanisms, which include markets, bureaucratic hierarchies, associations, and informal networks". They contend that "Governance is a phenomenon that is best conceptualised at the level of industries and industrial sectors" (5). In a similar way Hollingsworth et al. (1994: 5) write: "A governance system is defined as the *totality of institutional arrangements-including rules and rule-making agents-that regulate transactions inside and across the boundaries of an economic system*." They con-

focus is on the firm level (corporate governance) or sectoral level (sectoral governance) where different forms of regulating social (economic) interaction are analysed. The main concern is with the comparative efficiency of alternative arrangements in organising transactions, either as a problem of prescriptive analysis for optimising the design of institutions (Williamson, 1999: 93-119) or as a factor explaining institutional evolution (North, 1991/1990). Social processes of rule making are not part of the analysis in the economic perspective. These are in a sense exogenous and the focus is on the operational level of economic transactions.

With regard to the question of how institutions and mechanisms of governance come into being there is the implicit assumption of an overarching organising power (the state, the market or evolution) that puts them in place. If this assumption is questioned, an additional dimension of governance is opened up: political processes of rule making. Governance then includes the creation, maintenance and transformation of social forms of organisation through interventions in and modulation of existing patterns of interaction. These rule shaping processes (e.g. public policy or organisational management) are institutionally structured themselves. The interest in such 'institutionalised forms of shaping institutions' is especially developed in political science perspectives on governance where the focus is on the organisation of policy processes. This includes further levels such as constitutional reform as "second-order policy-making" that deals with the institutions of policy-making itself.

Several political science accounts of governance explicitly acknowledge the nested character of governance structures by drawing attention to rules of different orders or on different levels. Ostrom et al. (1994: 47), for example, distinguish an "operational level" a "collective choice level" and a "constitutional choice" level each with particular interactions and rules in their framework of analysis. Weale et al. (2003/2000: 5) distinguish between "primary rules" as "policies that are decided" and "secondary rules" that are "rules about rules; they define how the primary rules are made and how they may be changed."[4] Mayntz and Scharpf (1995b) distinguish between "performance structure" (Leistungsstruktur) and "regulatory structure" (Regelungsstruktur) of a societal domain.

Governance in political science is used to demarcate a departure from a narrow understanding of societal steering as unilateral, hierarchical control by

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tinue to say: "Alternative concepts used in this volume are 'socioeconomic regime', or 'industrial order'."

[4] In a similar vein, Nelson and Winter (1982), in their foundational study of innovation dynamics, distinguish organisational routines, and routines to change organisational routines.

the state. It indicates awareness for a variety of institutional arrangements across different levels of political systems (including the international level that was traditionally understood in terms of "anarchy") as well as across different issue areas and sectors of society. In contrast to pure hierarchy or pure anarchy, governance acknowledges a diversity of interaction patterns, rule systems and rule-making processes that reproduce social order within the various policy domains. Eising and Kohler-Koch (1999: 5) stress this open analytical understanding in which "'governance' is about the structured ways and means in which the divergent preferences of interdependent actors are translated into policy choices 'to allocate values', so that the plurality of interests is transformed into co-ordinated action and the compliance of actors is achieved."

As I noted already, this broadening of perspective was supported by the disruption of the image of state control. Political debate and implementation studies had contributed to a rising perception of government failure in the 1970s and early 1980s (Mayntz, 1997/1987). The widening of perspective brought new forms of cooperative steering by public and private actors and self-regulation of private actors into view which had been earlier marginalised by the dominant image of state control. Against the background of established understandings of societal steering as 'government' these complex, polycentric, network based forms of steering without a central instance for authoritative norm-setting appear became perceived as "new" modes of governance (Rhodes, 1997; Eising, Kohler-Koch, 1999: 5; Borrás, 2003: 11). Much of political science research on governance concentrates on understanding the effectiveness, legitimacy and emergence of such apparently new modes of governance that get by without a central norm-setting authority.[5] Sometimes governance is turned into a counter-concept to the hierarchical control model that is implied by the term government. It is then not an open analytical notion to grasp a variety of different patterns of societal steering, including hierarchical control, but is used to denote everything but hierarchical control (Rosenau, 1992; Rhodes 1996; Héritier, 2002).

An important aspect of the differences in emphasis of the economic and political science perspective on governance is the level of regulation. While economic governance concerns the regulation of social and economic interaction, political governance concerns the regulation of political interaction where rules of rule-shaping processes are negotiated. The distinction is not always clear-cut, though. Economic analyses sometimes include concern for the patterns in which governance becomes transformed (Lindberg, Campbell, 1991).

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[5] See, for example, the large EU-funded project on "New Modes of Governance", http://www.eu-newgov.org

Political analyses are sometimes concerned with the organisation of economic activity (Schneider, 1991).

For a general social theoretical concept of governance, the economic and political approaches are complementary. Then, governance refers to the patterns and mechanisms in which social order is generated and reproduced, including the ways in which society steers itself.[6] The processes in which forms of social organisation are reflexively shaped move into centre of attention. In other words, this comprises primary rules of interaction as well as secondary rules of shaping rules of interaction. Governance, in a broad sense of societal steering thus includes a dynamic relation between interaction and structure in at least two coupled arenas: interaction and rule systems in a particular social domain and the related shaping activities structured by specific (secondary) rule systems. The terminology of 'primary rules' and 'secondary rules' is less important than the identification of the two arenas with different reflexive processes. In Section 2.4 I will offer an elaboration of this integrated perspective by expanding Giddens' notion of structuration. To do so, I must first (in Section 2.3) discuss the two currently dominant perspectives.

2.3 Perspectives on governance: design and dynamics

A key difference in the way in which governance is perceived and addressed in the literature and in practice concerns the sources of rule patterns that make up de-facto governance of societal interaction. Some accounts view governance as a result of intentional design, others as an emergent result of complex dynamics. This contrast is at the core of *problématique* of societal steering. And it is especially relevant for understanding the role of policy instruments in governance.

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[6] Cf. also how Benz (2004: 25) attempts an identification of the "Begriffskern", the core of the notion of governance, as follows (my own translation): "1. Governance means steering and coordinating (or also governing) with the aim of managing interdependencies between (usually collective) actors., 2. Steering and coordination build on institutionalised rule systems that shall guide actors while it is usually a combination of different rule systems (market, hierarchy, majority rule, negotiating rules) that are prevalent. 3. Governance also comprises patterns of interaction and modes of collective action that emerge in the framework of institutions (networks, coalitions, contract relations, mutual adaptation in competition). 4. Processes of steering and coordinating as well as patterns of regulation that the notion of governance seeks to capture usually transgress organisational boundaries, especially the boundary between state and society that have become blurred in political practice. In this sense, policy making normally takes place in interactions of public and private actors (or of actors within and outside of organisations)."

In the design perspective governance appears as strategic intervention; in the dynamics perspective it appears as patterns in societal self-organisation. The design perspective in governance analysis is concerned with the capacities (and authority) of designated governing entities (state, public policy, government, political system, management) to steer complex societal dynamics. Accordingly, governing tends to be positioned outside and independent of the system to be governed and the analyst puts herself into the same position, at the side of the governing actor. The dynamics perspective, on the other hand, is concerned with understanding the generation and reproduction of social order and patterns of societal development. Governing is then seen as endogenous to social change. Steering activities as well as analyses are inside the system, embedded and part of social structure and dynamics of change. Whereas the design perspective takes the view of a focal actor, the dynamics perspective takes an evolving system view. I shall fill out the two perspectives with the help of some key literature (and thus to some extent reduce the variety of views).

2.3.1 Governance by design

The perspective of governance as a result of intentional design is widespread in policy-oriented strands of political science and in economics. "(…) design signifies purposeful and deliberate intervention that succeeds in establishing new institutional structures and processes, or rearranging existing ones, thereby achieving intended outcomes and improvements. That is, design is understood in terms of a chain of effects from human purpose to desired results." (Olsen 1997: 205) In this perspective, governance appears as enlightened government or government by other means. The basic idea of government as a centre in society from where societal structures can be formed and reformed is maintained. Governments can make a choice between different patterns of regulation, and governance is something to be utilised by steering actors: "From a governance perspective the state, the market and social networks and communities are seen as institutional mechanisms of regulation that can be *used* in variable combinations" (Benz, 2004: 20, my own translation and emphasis).

The economic analysis of governance mechanisms, even if it does not address design itself, has a 'governance by design' focus because it focuses on ways and means and their effectiveness. Williamson (1999: 11) emphasises that "Governance is (..) an exercise in assessing the efficacy of alternative modes (means) of organization. The object is to effect good order through the mechanisms of governance." Already the notion of institutions is directly linked to a presumption of design in the economic perspective on governance: "the humanly devised constraints that structure political, economic, and social interactions" (Douglass North 1991: Institutions, in Journal of Economic Perspectives

5 (Winter): 97-102 cited by Williamson, 1999: 4). In a similar vein (North, 1991/1990: 73): "the purpose of this study is on organizations as purposive entities designed by their creators to maximize wealth, income, or other objectives defined by the opportunities afforded by the institutional structure of the society."

The difference between government and governance in this perspective is located on an instrumental level. Governance is more sophisticated government. Kooiman (1993b: 2) proposes to use the notion of governing to describe this: "by governing we mean all those activities of social, political and administrative actors that can be seen as purposeful efforts to guide, steer, control or manage (sectors or facets of) societies." In this perspective, governance appears as "new forms of interactive steering, managing, controlling or guiding certain sectors of society" that governments employ to deal with complex environments. These comprise "experiments with co-regulation, co-steering, co-production, cooperative management and public-private partnerships on national, regional and local levels". These "changes (…) may be the expression of preferences of ways of governance" and "have to do with efforts to deal with matters of governability" (Kooiman, 1993b: 1).

Governance here denotes a new form of public policy. Governance is used in opposition to government as a non-hierarchical steering approach – but on another level the concept of government as a central unitary actor remains, an actor who can choose and implement these different forms in order to achieve its goals (Olsen 1997: 212). Rhodes (1997: 15) asserts that "The term 'governance' refers to a change in the meaning of government, referring to a *new* process of governing. (…) governance refers to self-organizing, interorganizational networks characterized by interdependence, resource exchange, rules of the game and significant autonomy from the state". And he continues: "I argue that British government can choose between 'governing structures'. To markets and hierarchies, we can now add networks. (…) The choice is not necessarily or inevitably a matter of ideological conviction but of practicality; that is, under which conditions does each governing structure work effectively." (Rhodes, 1997: 47)

This perspective sees policy analysis as supporting public officials in designing and implementing policies, sometimes with a secondary concern as to what policy makers actually can do to influence societal developments. Such studies tend to put greater weight on intentional design by policy makers (and other actors). Even while the role of political strategies is acknowledged, governance is governance by design. Similarly, when it is recognised and sometimes explicitly problematised that policies face autonomous dynamics in their respective domains, it is turned into a requirement to understand these dynamics

so as to intervene more effectively, i.e. a call for increased capacities of the central actor.

The design perspective moves up a level by reflecting upon different ways in which governments can steer beyond traditional hierarchical control ideals. This is obviously important in order to develop alternatives and provide strategic orientation to government actors who face obstacles in effectively implementing direct control measures. The assumption of a kind of actor who is a "philosopher king" or "benevolent dictator" who listens to advice and makes enlightened rational choices remains central. A further assumption is that such an actor has the skills and power to implement the designs for new modes of governance as they are discussed in theory. While it is easy to criticise these assumptions, my argument is, firstly, that there is a rationality to them, but that it is only partial, and secondly, that the design approach can be productive even when it builds on an illusion of control (see Section 2.5).

2.3.2 Governance through dynamics

The other perspective, of governance as depending on development and change of de-facto societal patterns of regulation, is often justified by criticising the idea that there is a central powerful entity like government whose intentions and activities can be taken to explain existing institutional arrangements and patterns of interaction. Instead, governance is an emergent result of complex dynamics of social change, including interacting and interfering influences from distributed steering attempts. If there are strategic actions they are based on an idea of "going with the flow", modulation and adaptation, continuous learning in interaction and developing a ironic stance towards the impossibility to anticipate unintended consequences (e.g. Dobuzinskis 1992; Rip, 1998; Rip, 2006).

Kooiman (1993b: 3), who used the term "governing" to characterise "all those activities of social, political and administrative actors that can be seen as purposeful efforts to guide, steer, control or manage (sectors or facets of) societies", reserves the term "governance" for what I call "governance through dynamics" here: "By 'governance' we mean the patterns that emerge from governing activities of social, political and administrative actors. These patterns form the 'emerging' outcome as well as more abstract (higher level) framework for day-to-day efforts at governing." The notion of governance is reserved for such a "focus on particular forms of social-political interaction as expressions of social, economic, technological and cultural forces that are complex and dynamic and have to do with "primary processes" in sectors of society". Thus, there are two parts to this perspective of governance through dynamics. First, there is the claim that governance as evolving macro patterns cannot, and should not, be reduced to the linear effect of intentions, plans, strategies and

design activities of particular actors such as governments. This is also how Weale et al. (2003/2000: 488) conclude their study of European environmental policy: "The European system of environmental governance is, to paraphrase Hayek, the product of political action, but not of political design." Second, evolving patterns of de facto regulation can be modulated, somehow, and this is what actors interested in governance (and analysts advising them, or offering perspectives generally) should aim for.[7] In this section I focus on the arguments in the literature which emphasise overall dynamics. It is only by reconceptualising these dynamics in terms of grades of structuration (in Section 2.4) and by revisiting the design perspective (in Section 2.5) that I can address governance through dynamics as such. The notion of governance as the effect of emergent patterns of social regulation is visible in sociological and evolving-system studies, but also in some foundational economics studies (Hayek, 1969). The macro patterns in broad cultural and institutional dynamics in which human agency is embedded are the focus. Interactions of various steering actors, unintended consequences, contingency and historicity of societal development are highlighted. Social regulation comprises the totality of formal and informal norms, paradigms, actor constellations and sometimes also technological structures that interact with each other and generate particular outcomes and dynamics. Emergence and reproduction of societal structure as a real world phenomenon occurs and is seen as beyond control of any individual actor. (De facto) governance appears as a "spontaneous order" (Hayek, 1969) resulting from mutual adjustment (Lindblom, 1969), reciprocal typification (Berger, Luckmann, 1969/1966), autopoiesis ((Luhmann, 1987)), evolution (Axelrod, 1984), self-organisation (Küppers 1999), or co-evolution (Norgaard, 1994). A further interesting gloss is how Czada and Schimank (2000) refer to the development of language (as analysed by Keller (1994)) to clarify how social structure emerges, develops and regulates interaction without itself being the result of design.

For the question of governance, such views of dynamics (Mayntz, Nedelmann, 1997/1987) can be conceptualised as how diverse elements (such as actors, organisms, systems) adapt to the present state of a constellation (through mechanisms such as rational action, variation and selection) that is itself the result of prior interaction (such as communication, movement, exchange of resources). Every element thus adapts to every element. This can lead to absorption (or exclusion) of possible deviation (as in path dependence, structural stability) or amplification of deviation (as in path creation, structural change) and will give rise to complex, non-linear system dynamics (Czada, Schimank, 2000; see also Kauffman, 1995).

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[7] Arie Rip offers an in-depth discussion and elaboration of this point on the basis of a co-evolutionary conception of dynamics of socio-technical change (Rip, 2006).

In such a view, governance appears to evaporate as a useful concept and a practical challenge because it coincides with evolving social order and institutions. So let's turn the question around: when and how does evolving social order show features of governance? This happens if evolving social order is reflected upon in social communication, if it is analysed with respect to effectiveness and legitimacy, possibly criticised on these grounds and confronted with hypothetical alternative orders. The articulation and recognition of institutional patterns already has effects: it can reinforce them or open them up. Whether strategically intended or not: by talking about institutions, they will be further shaped institutions. Thus, there is governance. The very act of reflecting upon and articulating macro-patterns is an intervention, even if not always in a very targeted or even assertive way. Thus, there is an element of design (in a weak sense). As Czada and Schimank (2000) rightly point out, pure dynamics without any influence of design, is a rare constellation in institutional change. Thematisation and discussion of institutional change with regard to effectiveness and legitimacy, making it part of governance (in my characterisation of the concept), introduces a design perspective and possibly design action.

In other words, while I am pushing the aspect of dynamics, it is not as an alternative to design, as is sometimes done by advocates of social self-organisation. My argument is to put dynamics upfront, in any case in the analysis and understanding of governance. Thus I avoid inconsistencies as in Hayek's advocacy of self-organisation in free market settings. It is itself formulated as a proposal for a particular institutional design and requires an institutional framework including contract law and competition policy in order to keep up and protect pure dynamics of mutual adaptation against fraud and collusion (for a critique of Hayek's ideas along these lines see Brodbeck 2001). The important point is that the dynamics perspective on governance calls into question the capacities of any single actor to design and implement institutional arrangements, whether these arrangements are based on negotiation or societal self-regulation. A corollary to this is that identification of modes of governance and generally comparative assessment of institutional arrangements for optimising patterns of social organisation, however interesting such exercises are, are a questionable basis for choice of a best mode or a best arrangement which must then, somehow, materialise. I will return to this point in Chapter 3 when I discuss design as linked to both development and implementation.

When putting dynamics upfront, de-facto existing patterns of regulation which influence social interaction and development take prominence. Instead of foregrounding only the few cases in which actual processes can be explained by reference to intended effects of design, the messy bulk of regulating effects from unintended consequences of design or from institutional effects of activi-

ties that are not at all intended as design are put into focus (Greshoff et al., 2003).

In this perspective on governance, public policy appears as just one of many forms in which social order is produced. Apart from public policy, social interaction patterns are shaped and societal development is influenced in the direction it takes in the case of business organisation, scientific knowledge production, technology development, public discourse, and daily life. In all these areas there may be intended effects, but to a large degree it is the unintended effects that shape evolving governance arrangements. This general point is very clear in our present risk society. The emergence of an environmental movement, foundation of green parties and development of an international environmental policy, as quite important changes in governance patterns through the last 25 years, cannot be adequately be understood without reference to "acid rain" and "Chernobyl" as unintended consequences of technology development – which have even become emblematic so that one can refer to them (as I just did) without having to explain them.

Thus, further points are that governing actors are inside, and part of, the dynamics that are governed, and that design activities do not appear as an independent external influence on change, but as embedded in a web of interactions and as shaped by the patterns that emerge.[8] These are topics which will be discussed more systematically in the later sections of this chapter.

2.3.3 The need for an integrated perspective

In the above, the design perspective and dynamics perspective on governance were treated separately even if I intimated already that design and dynamics are always entangled – and actually two parts of the same coin of 'governance'. The separate presentation reflects the circumstance that they are followed and further developed in different research strands with their own theoretical concepts (e.g. rational choice in design and evolution in dynamics). Other authors have recognised the two strands: Kooiman (1993a: 3) proposes to "work on the two levels we have distinguished: on the governance and on the governing level" and identifies key issues of governance research as "basically matters of the relation between governance and governing". Peters (2000: 36) similarly distinguishes two approaches in governance research: "state-centric" approaches that are interested in public actors' "political and institutional capacity to 'steer'", on the one hand, and "society-centred" approaches with a focus on "coordination and self-governance as such", on the other hand.

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[8] To put it more strongly and in action-theoretical terms: Political strategies, like other patterns of action, are a product of ongoing changes, not their source.

If these two research perspectives remain separated, there are missed opportunities, in terms of the success of practical strategies of public policy, as well as the scholarly understanding of governance and social change. Each perspective by itself has its shortcomings. In the design perspective, there is a neglect of the complexities and politics involved in the process of developing designs and implementing them in political practice. In the dynamics perspective there is a neglect of the ubiquity and centrality of design in social actions and the important differences it can make in dynamics even if it is not successful in achieving proclaimed goals.

An integrated understanding of design and dynamics in governance is needed, but under-conceptualised. To develop such an integrated perspective, I first offer a diagnosis of the reason for their separate treatment. There is a tendency for conceptualisations of social change to start either from an action-oriented design perspective or from a systems-oriented dynamics perspective (see on this point also Czada, Schimank, 2000 who discuss concepts of institutional change; and ; Smith, Stirling 2006 who discuss a similar point as 'inside' and 'outside' perspectives on technological change).[9] The general tendency reflects the foundational issue of relating agency and structure in social theory (as well as in social practice). Any integrated perspective must therefore start with the agency-structure issue. I will do so by using Giddens' concept of structuration (1986/1984) and developing it further into an integrated concept of governance which comprises steering activities as well as structural dynamics.

In fact, governance is an important domain to apply the notion of structuration to and further develop it. Governance is at the same time a pattern that structures interaction and a process which is driven by governing activities. Governance of a sector, a region, an organisation, a country or the world refers to both aspects, the structure and the interaction processes that reproduce this structure and are shaped by it. When we say governance we refer to the *process of governing* or to the *state of being governed* and thereby to a pattern of rule-like behaviour. This ambivalence in the use of language tells us something about the recursivity of governing action. It produces rules, structures and shapes the course of societal development and is at the same time ruled and structured itself, enabled and constrained by the result of prior societal interaction and governing processes.[10]

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[9] An episode in German-speaking social science that illustrates the antagonism is the enduring debate on 'politische Steuerung' (political steering) between Niklas Luhmann and Fritz Scharpf (Luhmann, Scharpf, 1989) that shaped conceptual work for the coming decade (Lange, Braun, 2000).

[10] In a similar way Ortmann et al. (2000: 315) conceptualise "organisation" as a duality of structure and process: "When we say 'organisation' we operate with a fundamen-

2.4 Three grades of structuration and governance

Giddens has taken structuration as a starting point for an outline of a social theory that tries to overcome the dualism of agency of structure (in sociological thought) with the concept of duality of agency and structure as mutually constituting components of social life. Social structure is reproduced by action and action is enabled and constrained by structure, in a recursive relationship.

"Structure, as recursively organized sets of rules and resources, is out of time and space, save in its instantiations and co-ordination as memory traces, and is marked by an 'absence of the subject'. The social systems in which structure is recursively implicated, on the contrary, comprise the situated activities of human agents, reproduced across time and space. Analysing the structuration of social systems means studying the modes in which such systems, grounded in the knowledgeable activities of situated actors who draw upon rules and resources in the diversity of action contexts, are produced and reproduced in interaction. Crucial to the idea of structuration is the theorem of the duality of structure, which is logically implied in the arguments above. The constitution of agents and structures are not two interdependently given sets of phenomena, a dualism, but represent a duality. According to the notion of the duality of structure, the structural properties of social systems are both medium and outcome of the practices they recursively organize." (Giddens, 1986/1984: 25)

Through “reflexive monitoring of actions” and evaluation of their effects, actors may be stimulated to change their behaviour and in this way transform structures (Giddens, 1986/1984: 5). Giddens is mainly concerned with mundane practices of day-to-day life. He does not pay much attention to the specialised realms of interaction that emerge around reflexive monitoring and rule shaping and the emergence of institutions and professional roles of management and public policy. Moreover, he does not differentiate between different degrees of stability of structures and related possibilities to transform them.

Reflexive monitoring at the level of macro patterns of ‘the social’, often an unintended and unreflected result of interaction, does occur. The patterns may become subject of reflection: when people realise that their interaction is patterned and that these patterns bring about certain kinds of collective outcomes. Actors may ask themselves what they are doing, what it is that lets them end up in a certain situation again, why similar effects reappear with great regularity – and why the routines, situations, effects are so different in other regions of the world, or even between professional contexts of interaction and family life. They suspect that there may be patterns that evolve behind their back and are

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tal ambiguity. We could refer to the process of organising or to its outcome, the ‘being organised’ of social interaction and hence a system or organised agency” (my own translation).

working on them as 'invisible hands'. The work of analysts can be positioned as making these hand visible (Rip, Groen, 2002).

Actor-centred institutionalism (well-known in the German speaking social science community) also attempts a combination of agency and structure in a recursive concept (Mayntz, Scharpf, 1995a). This is especially pronounced in attempts to link up with broader social theory and dynamics of macro patterning such as functional differentiation (Mayntz et al., 1988; Schimank, 1996; Lange, Braun, 2000). The focus is on structure and agency on a level of interacting organisations, not individuals as with Giddens. There is often a preoccupation with Luhmann's system theory and its focus on societal subsystems as the main structure of society, however. Their work will be another input in my development of an integrated perspective.

To expand the concept of structuration in this direction, I analytically distinguish between three grades of structuration with differing degrees of independence of structural dynamics from agency. This is the key dimension to integrate design approaches and activities in dynamics. This is also the difference to Kooiman's (2003) more cybernetics-oriented distinction between three orders of governance: "In first-order governance, governing actors try to tackle problems or create opportunities on a day-to-day basis" (135), "Social-political problem-solving and opportunity creation (first order governing) are embedded in institutional settings. The care for and maintenance of these institutions I call second-order governance" (153), "Meta as third-order governance is of a different type. It folds back on the theory and practice of governing and governance *as such*. Meta governing is like an imaginary governor, teleported to a point 'outside' and holding the whole governance experience against a normative light" (170). It will be clear by now that there is no "point outside", even if taking such a view temporarily can be heuristically useful. I will take structuration, and thus social change, as my entrance point, and discuss governance on that basis.

2.4.1 Three grades of structuration

In the *first grade* of structuration, structure is relatively fluid and directly connected to agency. In this case, structure is patterns in interaction, regularities that emerge from mutual adaptation in repeated interaction, up to conventions (Young 1996). Expectations develop about how things will be done in the future (Berger, Luckmann, 1969/1966: 56-60). Stabilised interaction patterns are more than the sum of individual actions, also because as a constellation they feed back on and shape individual actions on the micro level. In the first grade of structuration, however, action is not strongly constrained by interaction patterns and role expectations. There are the obvious incentives to conform one's behav-

iour with others, like reducing uncertainty (and irritation), by staying within regular patterns of behaviour. Actors may not even notice that they move along patterned trails of action. On the other hand, routines are relatively flexible, and the investments made by actors in their roles are low, so that change, reorientation and adaptation are still easy and relatively cheap. Interaction patterns can therefore easily change; they are relatively fluid; the constellation is "warm", not yet cooled down and solidified (Callon et al., 1986). A further implication is that context developments which alter the balance of incentives can easily shift behaviour beyond expected roles and change interaction patterns.

This picture of first grade structuration may read as an origin story, of patterns building up from interactions somehow. But there are always earlier interactions and patterns. First grade structuration also applies to situations where spaces open up in existing articulated and stabilised patterns. This can happen because of destabilisation through internal and external pressures, and/or the advent of new options and opportunities. Such 'spaces', whether primeval or opening up, are shaped by context, space and time (as Giddens rightly insists).

A simple and stylised example (to which I will return) is a group of people running about in a room. First grade structuration brings about a pattern where people run in one direction on a circle-line in order to reduce the effort to avoid bumping into each other. This would be a self-stabilising pattern of interaction. If anyone needs to stop or run across the room to run up to a friend there is nothing than the extra effort to take care not be run over by others that could prevent her from doing so. If many would go for such "deviations", the pattern would dissolve. Perhaps a new one would form again after a while, for example a circle going in the other direction. The room would remain the same, even if it is possible in principle for the actors to want to re-shape it, or perhaps move to another space.

In the *second grade* of structuration, social structure becomes articulated as rules for interaction. Interaction patterns are reproduced and maintained beyond the earlier phase of spontaneous mutual adaptation and routinisation. There is an anticipatory feedback loop, as in self-fulfilling prophecies. When expectations stabilise, actors dare to invest in their roles in terms of identification, acquisition of skills, accumulation of specific social and material capital, etc. Such investments mean sunk costs as well as an emerging collective interest in keeping things as they are. Thus, there will be a requirement to secure these investments by making sure that interaction patterns are held in place. The stability of social order, the continuing solidification of patterns of interaction, becomes a value in itself. Along with an increasing collective interest there may well be - and often are – individual interests that profit (asymmetrically) from the stabilisation of social order. Those who see themselves as beneficiaries may actively try to reinforce and preserve structures – another type of agency.

Structures become further reinforced by monitoring and compliance mechanisms. Sophisticated means of codifying rules for adequate actions, sanctioning deviating behaviour and buffering the influence of external developments on the stability of interaction patterns come into place. The rules that have evolved from the spontaneous adaptation of strategies now take on a life of their own independent from the strategies of individual actors. Newcomers (and dissidents) are told "how things are done around here". In this way, interaction patterns become institutionalised and structure becomes objectified (Berger, Luckmann, 1969/1966: 60-65). As articulated rules for action, structure takes on a life of its own.

This is a qualitative shift, a reversal from rules and patterns as precarious outcomes of interactions to rules and patterns as forceful structures in their own right, causes rather than outcomes of actions and interactions. It results from an incremental process of objectification and accumulation of specific capital (expertise, skill, technology, etc.) within patterned interaction, and the positive feedback loops that lie at the heart of social structuration. Regularities shade into requirements into rules.

This complex shift amounts to the transition from first to second grade of structuration. For individual actors it becomes costly to deviate, not because a more attractive option is not available, but because sanctions would be too high or sunk costs would be lost. There will be higher degrees of functional differentiation of actor roles and increasing complexity of social interdependencies. The more individual actions are intertwined with each other in various forms of social organisation, the more important it becomes to rely on their regularity in order to achieve certain collective outcomes, the functioning of a social whole (Elias, 1997: 347-352).

In the simple and stylised example, second grade structuration would occur if the rule to run in a circle as well as the direction of movement are articulated and sanctioned as "in this room one runs in a circle and clockwise". If the risks of deviant behaviour or interests in existing patterns are high enough, people could set up educational programmes for newcomers in the room to teach them the rules of interaction and possibly also a policing system to monitor compliance and sanction rule breakers. To go against the rules would need some sort of revolution, a large enough number of dissidents to overwhelm the policing capacities. Or too strict policing which would create system-wide (in this case, room-wide) counter-reactions. In both cases, productivity (in this case, speed and smoothness of movement) would, for some time, be below what was possible under the stability of the old rules.

Finally, there is a *third grade* of structuration which includes institutional design as deliberate shaping of rules of interaction. This kind of rule alteration is a matter of collective action. A single actor alone cannot redefine established

rules simply by declaration. It requires coordinated shifts in behaviour by many actors who will together have to reproduce existing structures with their ongoing activities. And this, in turn, requires some capacity for collective action.

If structuration has gone so far as to prescribe certain ways of behaviour which are difficult to depart from by individual actors because it would endanger the functioning of larger social processes or incur formal or informal sanctions, interaction patterns would never change shape but only become ever more solid and sophisticated and more deeply engraved into the actors' own identity. There are cases, however, in which changing context conditions, internal dynamics of structuration or changing actor perceptions bring about performance problems in terms of existing interaction patterns and behavioural rules. What can happen then, of course, is a partial break-up of the order that has emerged; and unstructured strategic interaction (i.e. first-grade structuration) occurs. What can also happen is an attempt at collective change, working towards a coordinated shift of behavioural patterns. One reason would be to shift from a running system of interaction to another one without risking breakdown or major accidents. Another reason (and thus also another approach) would be to overcome resistance by vested interests who can now be forced or persuaded or may negotiate a compensation for their individual loss. This type of rule shaping is third grade structuration. It comprises the conscious self-steering of social entities by means of reconfiguring patterns of interaction. It entails reflection on the existence and the working of rules, the assessment of outcomes, and conceptualisation of alternative arrangements. This means that collective outcomes of alternative interaction patterns have to be anticipated – as well as steps in the transition towards them. It will be clear from this characterisation that it overlaps with governance, broadly defined, and that it includes both design and dynamics aspects. In this case, however, it is presented as social change and used to create an integrated perspective on governance.

Third grade structuration involves a special type of interaction in addition to the interdependent actions that give rise to first and second grade structuration. The shaping of complex rule systems involves many actors, a subset of the constituent actor network (that was the basis for structuration up to the second grade) which have at their disposal specific resources, such as knowledge about the functioning of different aspects of the system, legitimacy and influence to create acceptance of new rules and/or monetary resources to finance the reform project. And usually these actors also have at least slightly different goals with regard to how the new structure should look (if they do not think that it would be best to keep the old one). That means that the shaping strategies of different actors are interdependent and they have the potential to interfere with each other, either because complementary resources need to be joined or because actors with different goals start competing shaping projects or block central

resources. If these actors realise their interdependence, they are likely to mutually adapt their strategies in order to find better ways to achieve their goals. This is how capacities of collective action can be built and are built in practice. Accepted procedures for collective rule-making or hegemonic actors who are powerful enough to impose rule changes are specifically articulated cases of capacity for collective action.

This form of deliberate re-patterning and rule shaping does not figure prominently in Giddens' account of structuration. With a view to modern societies with specialised planning and management centres, extensive private and public bureaucracies and differentiated political systems, however, it is difficult to understand patterns of social interaction and change without taking into account systematic rule setting in the form of instructions, guidelines, orders, laws, etc. Although the majority of interaction patterns and rules that constitute society (especially in informal interaction) are reproduced in form of structuration of first and second grade, important parts of the structure of modern society has been modified and is maintained by reflexive "engineering" of social institutions. (Quotations were added to engineering to remind us it is not simple social engineering that is meant, but work enabled through articulated capacity for collective action.)

In the stylised example, the people in the room could build up capacity for collective action through deliberation and decisions on alternative patterns or rules of movement about running, or through accepting commands from a powerful actor enforcing, say, coordinated deceleration and change of direction. A further form of third grade structuration would arise if the group delegated (itself a capacity for collective action) the monitoring of patterns and outcomes, development and deliberation of alternative patterns and creation and enforcement of respective rules to one or a few of them who would then not run anymore, but take a position, say, in the middle of the room to watch, evaluate, perhaps moderate debate among runners, think and decide about reorganisation and issue new rules.

Due to my sequential exposition, and use of the terminology of first, second and third grades, this discussion of structuration can read as a sociological and differentiated version of the Hobbesian shift to the new Leviathan.[11] But the three 'grades' should be seen as analytical distinctions which each have different dynamics and which engage in interplay as they create patterns that govern societal interaction. What we observe as ongoing social change can, by differentiating three grades of structuration, be understood as a combined result of the different pattern-building mechanisms that are involved. In each particular

[11] I owe this connection to Arie Rip.

situation, one can then look for first grade, second grade and third grade structuration, as well as their interactions. As to the latter, an example would be how a collectively decided rule (third grade) would create spaces for new actions and interactions (first grade), up to "back stage" interactions and their rules which may undermine the intentions of the collectively decided rule.

2.4.2 Governance in a framework of structuration

The differentiation of three grades of structuration offers an understanding of social patterning and change which combines design and dynamics. These can now be taken as elements of structuration rather than as perspectives on governance, which is how I started out in this chapter.

Reflexive monitoring of action and adaptations of behaviour occur in all three grades, but the patterns emerge by different mechanisms. In the first grade, it is a matter of self-organisation as a result of mutual adaptation (in the stylised example: running in a circle is the emergent result of people trying to run without bumping into each other). In the second grade, there is an element of deliberate influence. This is not related to the creation of patterns, but to their maintenance and stabilisation. Only the third grade includes what we would call the design of rules and interaction patterns: activities of reconfiguring existing patterns according to an idea of how they could be. Design activities occurring in third grade structuration refer to and are embedded in broader dynamics, characterised in general terms as first and second grade structuration.

Design and dynamics in social patterning and change mutually constitute each other: Intentional design is an important element in structural dynamics – it makes a difference, even if not always the one that is intended. Actual structural dynamics are an emergent result of attempts at reconfiguring social structure in interaction with ongoing structuration of a first and second grade and with broader contextual changes. Without intentional design, the evolving patterns would look different. At the same time, however, these structural dynamics have constituting effects on intentional design activities as they include social problem framings, patterns of expectations, actor constellations and strategic action capacities. Design activities are shaped by the structures that it attempts to reform (Kooiman, 2003: 11-26). Without these structural dynamics intentional design would look different – or would not be possible at all.

So how does governance come back into the picture? Governance is most clearly visible in structuration of the third grade, but it also takes place in form of structuration of first and second grade. Already in the first grade of structuration perceptions, strategies and behaviour of actors is decisive for the shape of the patterns that emerge. In the second grade of structuration, the role of strategy and action becomes even more visible as rules become articulated, transferred and protected. In the third grade, actions are directly oriented towards the

creation and modification of rules, towards the redesign of the existing patterns. All these diverse forms of action and related processes of sense-making and decision are necessary and relevant components of governance (and governance change).

Moreover, explicit structuration of the third grade is always embedded in and interacting with structuration of the first and second grade. There is always mutual adaptation going on and new patterns of interaction emerge. Some of these patterns become articulated as rules and form a structure that takes on a life of its own as it continues to be reproduced. In parallel, there may be debate about the effectiveness and legitimacy of existing patterns and structures and attempts to reconfigure them through the use of authority or coordinated action. These processes of patterning combine different logics and strategies of involved actors.

Development within an organisation, for example, is the result of interplay between clique building, gossip and identity formation in the corridors, composition of teams, drafting of agendas, and assignments of tasks in the work process, administration, controlling and maintenance of corporate identity, and performance evaluation, mission formulation and restructuring programmes emanating from board meetings and the management floor. Without the structuration going on in corridors and in the work process, there would actually not be much to manage at all!

In other words, to understand governance one has to include all structuration processes, and not limit oneself to what Kooiman (2003) called 'governing'. There are many more examples, like processes of problem articulation in public discourse, of reality framing in science and of creation of action options in technology development, which can shape governing practices, in a more fundamental way than the specific influences of organised interests via lobbying (see, for example, Stone, 1988; Winner 1980; Jasanoff, 1995). Governance must thus be understood as being constituted by these ongoing societal developments as much as by the intentions of political leaders or powerful organisations. Governance is about multi-actor societal self-steering. For any focal actor like a manager of an organisation or a policy actor in a government agency, governing is always both steering (or attempts at steering) and being steered.[12]

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[12] A similar view is expressed by Braithwaite and Drahos (2000: 10) in their discussion of the concept of "webs of regulation": "The global perspective on regulation we promote not only reframes individuals as subjects and objects of regulation (as in the drug case) and states as subject and object of regulation (by Moody's, the IMF, the Rothschilds and Greenpeace). Understanding modernity, we find, demands the study of plural webs of many kinds of actors which regulate while being regulated

At the same time, however, governing in its various public and private forms of allocating financial resources, setting rules, creating actor networks, spreading information etc. does have an impact within these ongoing developments. But if we look at specific design activities that take place, they only have a very limited direct effect on overall dynamics. The probability of designed configurations to eventually work on their own terms is severely restricted by interference with other design activities and the ongoing transformation of the very structures that are being reconfigured, as a result of ongoing first and second grade structuration. So, while there is strategic action and even institutional design in governance and it plays an essential role, governance is not following a blueprint. The outcome of governance is only directly attributable to institutional design activities in very special circumstances.

Thus, it is important to characterise governance without relying on focal actors and governing activities.

Governance can be understood as de-facto existing patterns emerging from structuration in all three grades that regulate social interaction within a certain area of concern (a region, an organisation, a profession, a sector or a part of the world). These patterns consist of the totality of informal norms, discourses, formal regulations like laws, actor constellations which are emerging from and are reproduced by social interaction. Attempts at creating and modifying interaction patterns are part of these dynamics. The difference with social order, institutions or structure in general is that governance relates to patterns, and dimensions of patterns, that become the subject of reflection and debate with regard to effectiveness and legitimacy. It is the part of the social order that is called into question and put up for re-arrangement. Governance is thus the process in which society reflexively shapes its own constitution, in the large and in the small. In modern societies this comprises the state, organisations and their management, associations and networks, laws, statutes, rules of procedure, doctrines, methods, ethics and more. These form a complex pattern of societal self-regulation, in the sense of maintaining and sometimes shifting its own order.

Just as I located design as embedded in dynamics, one can locate public policy as embedded in governance in the broad sense I just outlined.

Public policy is a particular form of governing (in the sense of Kooiman, 2003) carried out through the institutions of the state. Governing, in a very general sense, can be understood as purposeful interventions in de-facto governance with the aim of modifying existing structures and introduce alternative arrangements with an expected performance that is more desirable (because it is

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themselves." For the state as a focal actor in governance, see also Pierre and Peters (2000: 26-27).

more just, more efficient, makes certain actors better off, etc.).[13] Public policy can take various forms like taxing or spending money, regulating, setting up organisations, producing goods and services, creating networks, collecting and disseminating information, etc. All these forms attempt to reconfigure de-facto governance by modifying or setting up new patterns of interaction, be it in the financial transactions, the conduct of economic and social actors, public administration, public enterprises, informal coordination of actors, or discourse and exchanges of information.

It is from this double perspective (on governance and on public policy) that policy instruments must be characterised and understood. They are part of the ideology and practice of public policy as active shaping or even control. But since public policy is itself embedded in broader governance, policy instruments are not just tools of public policy. In their conception, further development and implementation, they are part and parcel of the larger design and dynamics processes that I discussed in this chapter. One way to bring this out is to position policy instruments, not as tools serving policy, but as 'designs on governance'. This will be discussed in the next section (2.5), and provide a framing for the dedicated discussion of policy instruments in Chapter 3. Part of that framing is the notion of reflexive governance, a final step in my discussion of governance as part of structuration processes.

Reflexive governance takes into account that public policy and its reliance on policy instruments is itself embedded in, and constituted by, broader ongoing changes (Voß, Kemp, 2006). Reflexive governing strategies do not aim at full control, but interact with ongoing change with a view to modulate it – while recognising the ironies that are involved in doing so (Rip, 2006).

Within public policy analysis, there is a long tradition arguing for modulation rather than control, in particular Braybrooke and Lindblom (Lindblom, 1969; Braybrooke, Lindblom, 1963). Incrementalism (or 'muddling through') and mutual partisan adjustment are keywords. Practically, such strategies come down to foster learning in real-world experiments.

Reflexive governance (see contributions in Voß et al., 2006a) goes a step further by emphasising the sketching out of a range of possible problem definitions, by exploring open futures from the perspectives of various actors in scenarios, by keeping up diversity and operating with a portfolio of different strategic options in order to cope with unexpected developments, and by iteratively re-opening specified and agreed problem definitions, goals and strategies for

[13] Governing can in principle be done by any kind of actor, not only by the state as a designated entity on a societal level and the management as a designated entity on an organisational level. Governing can take place as media campaigns, street protest, terrorism, associational politics, professional self-regulation, etc.

renewed contestation, deliberation and revision. This is still indicatory, even if there are interesting examples already. For my purposes, there are two important points. Firstly, that the arguments in (see contributions in Voß et al., 2006a) derive from analysis of sustainability challenges, but appear to reflect the three grades of structuration and their interactions, and thus reinforce my general argument about governance in a framework of structuration. Secondly, reflexive governance comprises design (worked on as if outside of ongoing changes) as well as dynamics (to which design activities are an inside component). Reflexive governance sees attempts at control as a productive illusion because these bring about governance change, even while it is not the intended change. Thinking and acting from a control perspective is embedded in, and countervailed by, emergent dynamics of structural change (Voß et al., 2006b).[14]

These considerations constitute challenges for further work on policy instruments and governance change.

2.5 Policy instruments as designs on governance

As generic options, blueprints, or models of governance, policy instruments play a central role in the process of policy design as the "art of finding solutions to policy problems that specify desirable relationships between manipulable means and obtainable objectives" (Weimer 1992: 370). They entail the promise to deliver results by application of policy knowledge combined into instrumentalisable packages that can be used as tools. Policy instruments offer an alternative to "tinkering along", "reinventing the wheel" or unconsciously "trotting along beaten paths".

I already noted that this view of policy instruments in relation to public policy is only part of the story. They are part and parcel of broader processes and dynamics of governance, designs in governance, and their nature and effects should be understood in those terms. 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. For understanding governance more broadly it is thus interesting to know more about how policy instruments induce and structure innovation in various governance domains. This is another reason to carry out detailed case studies (see Chapters 6 and 7).

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[14] This reflexive perspective could also be labelled "trans-modern" as it is neither entirely modern, nor does it completely reject the relevance of the modern perspective of steering, as is the case in post-modern accounts of governance. It can also be related to the concept of reflexive modernisation as put forward by Ulrich Beck and others (Beck et al. 2003).

I have elevated the phrase ‘designs on governance’ into the title of this thesis to capture an essential dialectic (and ambiguity) in my analysis: to understand policy instruments in practice, I started by arguing that they are part of the dynamics of governance, and that governance should not be limited to a design perspective. Then I showed design and dynamics to be complementary and particularly visible in the third grade of structuration. With the benefit of this movement, I can now emphasise the importance of design again and locate policy instruments as more than tools and, in fact, designs on governance.

The notion of design on governance entails a tension. It suggests that design is developed separately from governance to which it is then applied. “Design on” carries the notion of a model being imposed on reality. This is indeed an element of how policy instruments work – or do not work – in the reality of governance, but it contrasts with the notion of policy instruments as embedded in governance.

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. Much of the debate on policy instruments is related to this programmatic neglect of peculiarities of governance in specific contexts. The notion of design captures a possible divergence between the process of creating a design and developing such policy instruments as generic models over time, and the reality of configured practices and institutions.

To conclude this chapter, I note a further governance issue that is linked to ‘design on governance’ and a possible divergence between model and reality. Since plan and projected configurations that should work remain precarious, there are two sides to presenting and taking particular ‘designs’ as policy instruments. The instrumentality of policy knowledge packaged in the form of models with performance specifications, for one, allows for structured learning and transfer of experience between sites of experimentation in the form of “immutable mobiles” (Latour, 1987: 227). This is the actual instrumental use of designs. Another side of instrumentality is a claim about the power of the design to shape, to reconfigure. This claim backgrounds a possible divergence between model and reality and its own precariousness and introduces an ideology of technical rationality and control.

Putting the dynamics perspective on governance upfront, control appears to be an illusion - a point that I have already made several times in this chapter. Political action, even if well concerted, is shaped by dynamics more than it shapes them. Unintended consequences are endemic.

The illusion of political steering and societal engineering and management, however, is a productive one. It can drive attempts at agency; it provides an orientation for debate about desired direction forms of society and directions of development; and is the basis for collective action that engages with ongoing structural changes. Too much reflection on the impossibility of control will undermine agency, as Renate Mayntz (1997/1983) notes in a discussion of potential benefits of theorising policy design. She advises caution, arguing that it "should not be overlooked that a theory of programme design could also have counterproductive effects by impressing policy-makers so much with the manifold risks of failure that they feel subjectively less certain than without such knowledge and consequently shrink from taking action". The illusion of steering or, more modestly, of being capable of making an impact, may be at the basis of human identity and self-enactment. In any case, it is at the basis of political interaction and its institutions. Schimank (1988) has shown the constitutional effect of "actor-fiction" (Akteurfiktionen) for societal systems, including the political system.

Thus, the illusion must be taken for reality if it is to be productive. But because of this, it can easily become counter-productive. That is, if it is not balanced by the awareness of it being an illusion and pragmatically adopted as a frame of orientation. It will then lead to presumptuousness and disregard of ubiquitous side-effects and, if they occur anyhow, induce a trajectory of increasing control power in order to optimise towards an imagined possibility of perfect mastery. More forceful intervention then brings about new side-effects so that control power needs to be extended and topped up further. This is a pattern characteristic of modern development (Beck, 1986; Dörner, 1989; Böhret, 1990).

Without appropriate conceptual frames, there is a tendency for the illusion of control to become taken for granted and to actually become institutionalised as a paradigmatic frame of reference for the interpretation and legitimisation of actions (Rip, 2006). The tendency for this to happen is increased in modern society by the differentiation of special roles (and, on a larger scale, even whole institutional subsystems) to which rule reflection and rule shaping (third grade structuration) is delegated. This is visible as the specialisation of management roles in organisations and the development of a separate "political system" within society. For such specialised governing roles the illusion of control becomes a dominant and defining framing (Stone, 1988; March, Olsen, 1989). It constitutes the reference against which performance is evaluated and apprecia-

tion accredited. The illusion thus becomes internalised in habitus and world-views and further cultivated in dynamics of professionalisation. The illusory view of governance as being under control of human aspirations and skills thus becomes a social reality (Schimank 1988).

A further consequence is that it gives rise to a particular practice of governing which is based on a problem-solving algorithm of (1) definition of clear and unambiguous goals, (2) development of knowledge for prediction of consequences and isolation of optimal strategy, (3) implementation of optimal strategies with minimised vitiating interference. In the trajectory of such governing practice unexpected performance requires reinforcement and optimisation of the instruments and imposition of order on contexts which interfere with the conditions under which the instrument is specified to work. This must continue until the situation is brought under control – while, because of such an attempt at mastery, side-effects will proliferate , (Voß et al. 2007).

3 The instrumentality of policy instruments

3.1 Introduction

My question about policy instruments and the paradox of their instrumentality becoming ever more important while at the same time being criticised as inadequate, or at least being rethought and put in the framework of reflexive governance, must be related to the literature on policy instruments. While this literature started, in the 1950s, with a toolbox perspective, it has become increasingly sophisticated, addressing political contexts of choice of instruments and the complexities of implementation and compliance, up to notions of co-implementation and joint learning.

In Chapter 2, I argued that it is not enough to relocate design, and policy instruments as specific designs, as embedded in local contexts and ongoing dynamics of structuration within domains of application. Such designs have a life of their own as well. Policy instruments must also be seen as resulting from, and being part of, cosmopolitan processes of constructing governance models from a disembedded perspective of technical control. But such envisaged technical control is part of a larger story, in which policy instruments *are shaped* by the politics of governance, but also *do shape* governance opportunities and directions. This dual instrumentality is captured in the notion of design in and on governance.

Concretely, as I will show in Section 3.3, policy instruments have a double life. They comprise both models of governance as well as actual configurations in governance that are rigged up to be made working. This duality between model and configuration which is at the heart of the design process embraces the paradoxical appearance of policy instruments and further specifies the notion of designs of governance. It also exposes a tension that is inherent to policy instruments and may give rise to specific trajectories in governance – as the mutual shaping and emerging couplings between model and configuration. This constitutes a research programme in which policy instruments appear as sites of structuration that introduce specific dynamics in governance.

To take this up in empirical studies in later chapters, it is necessary to make a shift from a dominant focus of policy studies on the policy process as it unfolds within a particular domain right up to the development of policy instruments as such. This requires ‘following the instruments’.

3.2 Evolving views on, and understanding of, policy instruments

A first instance of systematic enquiry into what we now call policy instruments is Dahl's and Lindblom's (1953) compendium of "social techniques". The rationale for their work is interesting because it gives a political argument for an apolitical approach. Starting point is "the possibility to achieving progress in extending freedom and equality through man's capacity for rational calculation and control" (516). For this, they argue, policy must become "technique minded" rather than to "argue policy in terms of the mythical grand alternatives" (16). Science has a central role: "Still in their infancies, the social sciences are already producing habits of thought, accumulations of knowledge, and theoretical propositions now beginning to command an agreement wholly impossible fifty years ago. (...) The substance of the emerging agreement on politico-economic policy is the prerequisite techniques of rational social action, this is the achievement of the social sciences" (18).

In this way, Dahl and Lindblom created an approach to public policy which sought to be independent of values and power politics. They set out to improve policy with the use of social scientific knowledge in order enhance rational social action.[15] The basic orientation explicated here continues to be visible, in one way or another, in later approaches and debates.

Policy instruments are conceived of as tools of government and research focuses on typologisation, effects of tools under various context conditions and on the choice of tools in the policy process. The goal is to optimise policy design and support societal steering by government. After the heydays of the 1960s, problems of implementation were recognised (Pressman, Wildavsky, 1973) and policy instrument research became more sophisticated (Hood, 1983; Bressers, Klok 1988). A further complexification is linked to the rise of the concept of governance. New forms of steering characterised by collaboration and indirect steering, and instruments for policy formulation in pluralistic actor constellations without a central authority to make unilateral decisions, become important. Policy instruments might even be conceptualised as optimising societal self-steering by public and private actors across different levels of governance. This is trying to take up some aspects of the dynamics perspective on governance. The next step then is to endogenise the design and development of policy instruments as part of governance, and to draw attention to their non-technical aspects and to turn attention towards how instrument-related policy

[15] They did not limit themselves to this ideology of instrumentality, however, but also presented particular techniques as a continuously changing array of context-related specifications.

discourses constitute governance problems and shape positions and relations of actors.

Below, I elaborate this brief review of the historical development of approaches to, and views on, policy instruments. This is interesting, because it shows accumulation of insights, with later perspectives building on earlier ones, even while they are critical of them. It also allows me to address the paradox of instrumentality.

3.2.1 The instrumental perspective in policy

Research on policy instruments emerged in the 1950s and went through several stages, acquiring momentum in the 1980s and 1990s. It is generally linked to questions of political steering, of how to do public policy, how to productively interact with societal dynamics with a view to modifying them. The notion of policy instruments as such introduces a technical rationality into policy practice and research (cf. Dahl, Lindblom, 1953). As Mayntz (1997/1983) phrases it: "To use Weberian terminology, interest has shifted from the value-rational to the instrumental aspect of policy: while formerly the substantive content of policies and how well they reflect social demands (or needs) had been the focal issue, the question is now how to fashion a programme as an effective instrument for reaching policy goals." Such instrumental perspectives on policy were particularly visible in post World War 2 economic (Keynesian) policies.

Dahl's and Lindblom's (1953) compendium of "social techniques" was mentioned already. Their work provides a detailed discussion of "sociopolitical processes" and a repertory of techniques.[16] They are quite explicit about the political rationale for their focus on "social techniques" (cf. above) and do not let themselves be blinded by the promise of these techniques. They do not present them as a fixed set of universally applicable tools, but rather discuss basic mechanisms (e.g. price system, hierarchy, polyarchy, bargaining) and how they combine, become adapted and extended to form a repertory of design principles (e.g. agency, enterprise, worker control, strikes, national wage bargaining). The underlying understanding is that the "number of alternative politico-economic techniques is tremendously large" and "constantly growing by discovery, invention, innovation" (6). They go on to emphasise that "(t)he process of innovation is both scientific and political. It is not enough that new social techniques be discovered; they must also be put into use. Invention and discovery are only the

[16] As examples of social techniques they list "the corporation itself (…), unemployment compensation, food stamps, cost accounting, zoning, Lend-Lease, cooperatives, scientific management, points rationing, slum clearance, government old-age pensions, disability benefits, collective bargaining (...), the European Payments Union and the Schumann Plan" (7).

beginning of a process the next step in which is innovation, a matter of politics" (8).[17]

Policy instruments gained attention as a perspective in policy studies, and recognition as important (as "tools") in political practice. In policy studies, research on policy implementation in the 1970s and onwards (with Pressman and Wildavsky (1973) as a continuing inspiration) laid bare manifold imperfections in putting policy goals into practice. After investigating specific conditions on the part of the state as steering subject (steering capacity) and of the societal domain as steering object (amenability for steering) the focus shifted towards the design of policies as medium of steering (effectiveness) (Majone, Wildavsky, 1978; Mayntz, 1997/1983).[18]

In policy practice, the surge of interest in policy instruments was related to the heating up of political debate over tenability of the welfare state and related shifts in government practice (Salamon 1981). A strong neo-liberal movement pressed for regulatory reform to reduce direct state intervention into the economy. At the spearhead of this movement were economists who advocated market-friendly policies, and added theoretical analysis and model simulations that showed the technical superiority of their proposals (as measured by economic efficiency). Some powerful political actors who were interested in regulatory

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[17] Linder and Peters (1998) see the 1953 publication by Dahl and Lindblom as a combination of elements from a tradition of structural-functional analysis of government activity (cf. Parsons, 1951) with elements from a tradition of comparative analysis of planning and intervention (cf. Tinbergen, 1956). The former is focused on systematic understanding and classification with a view to finding generic principles of public policy. The latter is oriented towards pragmatically compiling policy options and comparing their effectiveness with a view to optimising public policy. Both strands continue to be visible. In the 1960s, important works are Braybrooke's and Lindblom's treatment of problems of planning and complexity (Braybrooke, Lindblom, 1963) that was later translated into the "science of muddling through" (Lindblom, 1969) and a comprehensive typological inventory of economic policy instruments compiled by Kirschen and co-authors in which Dahl was also involved (Kirschen et al., 1964).

[18] The new approach was contrasted with the old one as follows: "The policy (…) operationalised in form of a programme, i.e. legal norms, financial appropriations, a plan etc., is taken as the starting point of the process to be analysed, determining what implementation is about in the specific case, but is not itself a focal object of investigation." (Mayntz, 1997/1983: 144). Against this background, it was argued that policy research should not only concern itself with the question, if a programme, however good or bad in itself, had been implemented as designed. If a programme was bad, the fulfilment of policy goals would not be supported by exact implementation.

reform for ideological reasons or because it supported their individual interests, welcomed this kind of scientific support for their case and readily embraced a technical discourse of public policy. This was especially the case in the fields of economic and environmental policy. The demand from policy practitioners interested in advancing market oriented policy reforms gave crucial support to instruments research (MacDonald, 2005; de Bruijn, Hufen, 1998: 12).[19]

Since then, policy instrument research has developed into a substream of policy research. This research is obviously connected to other streams such as theories of the policy process, agenda setting and policy formulation, policy design, policy implementation, policy change and learning, policy diffusion and transfer, institutional change and institutional design and governance research as discussed in the last chapter, to name a few other interrelated fields of policy studies. The specifics of policy instruments research, however, remains the ambition to determine distinct means or techniques of modifying societal dynamics. The dominant orientation is towards improving the achievement of policy goals through typologisation, functional analysis and comparative assessment of instruments as a basis for informed policy choices.

This orientation is visible in the various definitions of policy instruments that can be found in the literature: from a general characterisation like "policy instruments can be viewed as various combinations of institutional rules deliberately designed to influence certain action arenas" (Ostrom, 1986; quoted after Bressers, 1998: 85) to a range of definitions referring to government and public action: "all means that a governmental official or body uses or may use to promote the implementation of policy-targeted changes in the behaviour of other people or bodies" (Bressers, Klok 1988: 32), "policy instruments are techniques of governance which, in one way or another, involve the utilization of state authority or its conscious limitation to provide services to the public and governments" (Howlett 2004: 2), "A tool of public action is an identifiable method through which collective action is structured to address a public problem" (Salamon, 2002b: 19), "Policy tools are techniques the government uses to achieve policy goals" (Schneider, Ingram 1990: 527) up to definitions which attempt to broaden the perspective while maintaining the notion of instruments: "Instruments are institutions in the sociological meaning of the term. 'Institution' is used to mean a more or less coordinated set of rules and procedures that

[19] MacDonald (2005) critically notes: "The whole idea of instrument choice is a historically contingent motif that reflects a certain conception of public policy" (214). He distinguishes three time frames for what he terms the "reflection about 'choice of governing instruments' as a particular economically oriented subset of social-ordering theory": 1977-85, with a focus on regulation and efficiency, 1985-95 smart regulation, 1995-till now, governance as collective endeavour.

governs the interactions and behaviors of actors and organizations" (Lascoumes, LeGalès 2007: 8).

3.2.2 Tools of government

Studies from the instrumental perspective, with its mechanical metaphor of "tools" of policy or government, have covered typologies, effects and choices. Within this perspective, different roles of analysts and views on policy instruments are still possible.

The job of the policy analyst is to scan, explicate, tidy up, refurbish and expand the "tool kit" or "toolbox" of governments and specify instructions of use by specifying conditions under which instruments are effective (Bressers, Klok 1988: 37). A more distantiated role can be added where the analyst critically examines how governments make use of the tools, especially how they choose policies and if this corresponds to what would be a rational choice based on prudent assessments of the appropriateness of instruments to policy goals and problem structure.

In the strong "instrumentalist" view (Linder, Peters, 1998) the tools are central, and the choice of which to use is a matter their characteristics and the goals of policy. "It is possible to speak of an orthodox view of instruments when referring to the rational model. The choice of instruments in this view is a question of optimization - that is, selecting the best instruments given the policy goals." (Ringeling, 2005: 190-191) This view appears to resonate with economic evaluation and market-based instruments, cf. how Ringeling continues: "That economic instruments work better than regulation in the environmental field is frequently heard and fits with the orthodox view (see Majone, 1989, ch. 6), as does the idea that it is better to use voluntary agreements than top-down regulation when environmental policy has to become a success."

The pragmatic view, or in Linder's and Peters' (1998) differentiation of schools of thought the "contingentists", emphasises a more open diagnostic approach Where instruments are to be matched with particular policy settings – either prescriptively or predictively. One example is that *ceteris paribus* clauses which protect economic and other stylised models against "distorting" effects of real world contexts, were left out. The real world context included the policy process with a particular political rationality, e.g. to instrument choice.

As to the first topic of policy instrument studies, typologies of instruments were developed with respect to several different characteristics. These characteristics were either derived from analytical distinctions between generic functions or media of steering (Hood, 1983) or from a perspective of specific requirements that instruments imply for the policy process (Bressers, 1998). Christopher Hood's (1983) "The tools of government" presented a typology of

policy instruments based on a cybernetic view on political steering which is still often referred to today. Interestingly, this typology differentiates groups of instruments according to four resources that are at the disposal of governments for use in modifying societal dynamics: nodality (for information), authority (for coercion), treasure (for finance) and organisation (for coordination). These resources can be used as detectors and effectors of societal change.

Since they became a focus of policy studies, various taxonomies of policy instruments have been produced (Hood 2007). Distinguishing characteristics of policy instruments range from types of policies: distributive, regulative, constituent, redistributive policies (Lowi 1972), to types of means: tax expenditure, regulation, subsidies, public ownership, moral suasion (Woodside 1986); direct provision, subsidy, tax, contract, authority, regulation, exhortation (Linder, Peters 1989: 44); facilitate markets, alter incentives, establish rules, supply goods through non-market mechanisms, provide insurance (Weimer 1992); and then to types approaches in the policy process: authority tools, incentive tools, capacity tools, symbolic and hortary tools, learning tools (Schneider, Ingram 1990); expanding alternatives, reducing alternatives, changing features of options, changing weighting of features of options, providing information on alternatives and their features (Bressers, Klok 1988: 33-34); normative appeal, proportionality, resources, freedom to opt out, bi- or multilaterality, role of policy makers in implementation (Bressers, 1998).

With respect to the second topic, effects of policy instruments, a major part of the research was occupied with expanding the orthodox view of economic instrumentalism in order to take account of the contingencies that affected the working of policy instruments in the real world. Ringeling (2005: 191) summarises the orthodox view as "[presuming] that instruments had inherent characteristics. When applied, they would work in a specific way because of these characteristics. Regulation would lead to certain effects, and economic instruments would lead to others." While this turned out not to work in a simple way, still the "ultimate objective is to establish a causal model of relationships between instruments, circumstances and effects" (Bressers, Klok 1988: 24). While maintaining the position that policy instruments are identifiable elements with inherent characteristics the challenge was to internalise theoretically all disturbing factors: "A theory of policy instruments oriented on practical applicability should provide sufficient room to accommodate in principle all relevant factors and examine not their separate but joint influence, as 'contingencies' or 'settings'" (Bressers, Klok 1988: 23). This mainly referred to the interaction of instruments with different implementation contexts, to the combined effects of several instruments in a policy mix, and, last but not least in terms of the status of the instrumentalist perspective, the modification of the conceptual design of the instrument itself during the political process (Bressers, Huitema 1996: 30-

32). There might be good reasons to adapt an instrument as one goes along, but it undermines systematic research into effects of the original instrument. A learning-by-doing approach can be added to the instrumentalist perspective, but this will lay it open to the critique of the "proceduralist" view that denies any role of instruments as general designs and instead claims that policy forms are idiosyncratic by-products of political dynamics that emerge from within particular contexts (Linder, Peters, 1998: 39). Mayntz (1997/1983), discussing the possibility of a "theory of program design", argues for a learning approach when she notes that "there is a limit to the extent to which a programme can actually structure implementation ex ante. There will therefore always be the need for active monitoring, for a kind of permanent process control if the programme is to produce the intended outcome – always assuming that political action is in fact goal-directed in this way. (…) Trial and error, learning by doing therefore will remain a valid and partly even inescapable second strategy in public policy." (Mayntz, 1997/1983: 164-165)

The third major topic of instrument research is the choice of instruments by governments. The instrumental perspective started out in the 1950s with a diagnosis of suboptimal policy choices which was to be blamed on the lack of knowledge on the part of policy makers who just did not know about the techniques that are available or who did not know how to assess them adequately (e.g. basing decisions solely on economic evaluation). So this was what policy instrument research should repair. An additional diagnosis which was subsequently brought up was that policy makers do not care about making good choices, but just follow routines and use instruments they are familiar with (Bressers, Klok 1988: 22). A further step (and a potential link to general political science) was to draw attention to the politics of instrument choice. "...the selection of tools has often nothing to do with optimization, for example, they are often chosen because they are fashionable or unobtrusive" (van Nispen, Ringeling, 1998: 216). Institutional style and strategies become a variable: "Organizations staffed by lawyers, for example, are more likely to use regulation and other legal instruments than are those staffed by economists or public administrators", "Organisations can use instruments as a political strategy to "capture" programs, thereby increasing budgets and staffing" (Peters, 2005: 360). Then there is the general political rationality of governments having to secure support from the electorate and interest groups. Symbolically demonstrating effectiveness while minimising frustration and resistance of powerful political groups (Edelmann, 1964) is, then, more important than technical problem-

solving rationality, even if the ideology of technical problem-solving is kept.[20] Accordingly, policy instruments can also be classified with respect to the broader political effects (Lowi 1972; Woodside 1986; Peters, 2002).

The relevance of institutional frameworks is now explicated by concepts such as majoritarian or consensus democracy or liberal or coordinated economies, by administrative cultures (Unger, van Waarden, 1995; Knill, Lenschow, 2000), policy paradigms and policy styles (Hall 1993; Howlett, Ramesh 1993), and specific structures of actor networks (Bressers, 1998) and attempts were made to integrate these into theoretical frameworks of instrument choice. In connection with the revival of an institutional perspective in policy studies the issue of path-dependence in policy choices also became an issue (Pierson 2000; Thelen, 2002). Policy instruments research went together with studies of comparative politics and policy change.

3.2.3 Transcending the toolbox?

By the 1990s, two developments emerged or became more visible, partly building on the recent sophistication of policy instrument research, but both taking the further step of leaving behind the quest for causal models to improve the design of policy instruments. There might still be tools, but these cannot just exist in the safety of a toolbox, either because the complexities of the world have to be addressed in a different way or because the tools are not just technical but also have a political character. I am emphasising the contrast with the evolving tradition of policy instrument research to highlight the characteristics of the new developments, while in fact there are overlaps and continuities.

First, there is the recognition of increasing complexity and dynamics of the social world and loss of central role of government in societal steering. The single unitary actor image of government is becoming dissolved into plurality of actors involved in steering and regulating society and bringing about public policy. This development is closely linked to the broader conception of societal steering that is introduced by the rise of the governance perspective. One could say that policy instruments research morphed into the design oriented perspective on governance (see, for example, Salamon, 2002c; or Eliadis et al., 2005). Or, the other way around, that the research programme on new modes of governance is a continuation of policy instruments research (Dunsire, 1993; Héritier, 2002). Irrespective of which sequence is foregrounded, the main issues are the same: what are appropriate means of policy-making in a world where gov-

[20] In a certain sense, this is still an orientation of technical problem-solving, just that the problem is defined as conquering and securing positions of political authority. Policy instruments have become tools for the retention of power.

ernments as publicly oriented, intelligible and powerful steering entities are becoming less central?

Actually, policies could already be carried out with cooperation of public and private actors; and government has never been unitary: it is composed of a diversity of public actors on different levels. The recent shift from direct steering or service production to procedural steering and coordination is a challenge to established perspectives in public administration and management now that "instead of a single form of action, public managers must master a host of different 'technologies' of public action, each with its own decision rules, rhythms, agents, and challenges", "a *new governance* that recognizes both the collaborative character of modern public action and the significant challenges that such collaboration entails" (Salamon, 2002b: 6, 18).

The focus of steering moves from direct and unilateral instruments to indirect and cooperative instruments that acknowledge that societal dynamics cannot be fully controlled, but only be facilitated, moderated or "collibrated" (Dunsire, 1993). This is linked to a shift from concerns with forms of direct governmental intervention to forms of modifying contexts of social interaction and indirectly modifying behaviour through "procedural instruments" (Howlett 2004; 2005), "institutional choice" (Weimer 1992) and "institutional design" (Goodin, 1998a/1996a).

After reviewing these developments, Fiorino (1999: 464) writes: "Underlying each strand in the literature is the belief that the increasing complexity, dynamism, diversity, and interdependence of contemporary society makes old policy technologies and patterns of governance obsolete." New approaches aim at adapting policy to increasingly perceived complexity and dynamics under headings such as "smart regulation" (Gunningham, Grabovsky, 1998) and "reflexive law" (Teubner 1983), to mention but two examples.

Policy formulation and programme design does not happen in form of a choice of instruments by high-level government actors, but as a complex process of negotiation in networks. While earlier literature in the instrumental perspective tried to overcome this messy, and in a sense non-rational process, it is now recognized and turned into something that should be drawn on rather than negated. In contrast to " instrument choice in terms of rather simple principal-agent terms, with delegation from one principal (the legislature or the minister) to a public agent (…) There are now multiple principals that charge individuals and organizations with implementing programs." (Peters, 2005: 362). The question of policy instruments has thus developed from one about substantive tools of steering to questions of how to design the policy process itself, i.e. arrange for "viability" (Timmermans et al. 1998), or for "good prospects for adoption and successful implementation" of chosen instruments (Weimer 1992: 370).

This can then lead into the development of “participatory governance” (Grote, Gbikpi, 2002) or discussion of the “art of heresthetics” (Weimer 1992).

This then links up with an interest in learning, which was already visible in more recent policy instrument research (Section 3.2.2). Viability now includes an orientation on processes and techniques to “promote policy-learning by, for example, building reliable feedback mechanisms into policy-making; strengthening learning networks; creating conditions that would lead to more trust and more productive dialogue; and building enough flexibility into the policy system so that it is possible to respond to lessons drawn from one's own experience or that of others” (Fiorino 1999: 468).

The developments just sketched transcend the earlier tool box approach by addressing more complexity and by expanding the toolbox to include other types of policy instruments focussing on viability of multi-actor processes rather than achieving an intervention goal. One could position this development as aiming to make modes of governance better, rather than making policy instruments better.

A further development wants to undermine the whole idea of a toolbox. It highlights a longstanding criticism of the appropriateness of the instrumental perspective for actual policy processes. The criticism is not directed at one or another specific policy instrument, but at the ideology of instrumentality, i.e. the “technologisation” of policy making by framing it as a problem-solving process with objective optimisation potential. Van Nispen and Ringeling summarise the critique as follows: "We run the risk of instrumentalistic thinking, of a mechanistic approach to policy processes: the planning and implementation fit neatly, the goals and means are linked to each other, the means are ready for utilization and the effects are clear. The picture thus created of policy processes is one in which there is no uncertainty. The policy maker is a craftsman who has mastered his toolkit." (van Nispen, Ringeling, 1998: 211).

They continue (van Nispen, Ringeling, 1998: 212) to identify three “wrong tracks” of instrument research: 1. to "consider instruments as neutral means and deprive them of their political character", 2. that "effectiveness becomes the only relevant yardstick for the evaluation", 3. that "we assume that the policy maker controls the instruments, but in practice policy makers often turn out to be the victims of their policy instruments". The first point has been expanded further: "Tools are anything but neutral; they are highly normative (…) Given these qualities of policy instruments, debates over government tools constitute an important part of the political and societal development of particular countries." (Ringeling, 2005: 185-186)

The point here is not the critique of the ideology of instrumentality, which is well known, but the importance of debate on the nature and status of policy instruments, as one way of making governance more reflexive. Such (construc-

tive) debate has become quite strong, with reflections on the objectivity of policy knowledge, the political role of experts, politics of discourse and post-positivist developments in policy analysis (Hajer, 1995; Fischer, Forester, 1993; Gottweis, 2003) or on the history and sociology of science and technology (Callon, 1986; Desrosières, 1998) and insights into the role of policy instruments in the social construction of political reality (Lascoumes, LeGalès 2007).

Linder and Peters (1998: 41) refer to this development as the "constitutivist" approach to instrument research that moves the political nature of instruments into focus. The articulation and development of instruments, their comparative evaluation and appraisal of feasibility co-constitutes political reality by providing particular models of governance that imply problem framings, specific roles and responsibilities of actors and criteria for what can count as a rational solution. These models shape political interaction and are themselves part of the political process, but not as neutral tools and objective knowledge, but as frames for interpreting policy problems and elements of political discourse: "tools represent one form of socially constructed practice whose meaning and legitimacy are constituted and reconstituted over time (…) meaning must be established and sometimes negotiated as an antecedent to any matching of tool and problem." (Linder, Peters, 1998: 41).

What we see here is endogenisation of policy instruments into the political process, by conceptualising policy instruments as models of governance which are not outside the processes and impact on them, but are themselves a result of interaction processes in which values and politics are at issue. This is not just a sociological point about the life of policy instruments, but has important implications for further research on instruments as well as on governance dynamics.

"Instrumentality" becomes a topic of empirical political analysis, not of technical policy prescriptions. "(T)he politics-design dichotomy itself is abandoned in favour of an interactive notion of design as competing political constructions of instruments" (Linder, Peters, 1998: 43). "We should then go on to look at the specific dynamic of instrumentation. Public policy instruments are not inert, simply available to sociopolitical mobilizations. They have their own force of action: as they are used, they tend to produce original and sometimes unexpected effects" (Lascoumes, LeGalès 2007: 10). "Translation of and through technical instruments is a constant process of relating information and actors, and of regularly reinterpreting the systems thus created." (Lascoumes, LeGalès 2007: 7)

The constructively critical position on policy instruments can be summarised by this quotation: "A public policy instrument constitutes a device that is both technical and social, that organizes specific social relations between the state and those it is addressed to, according to the representations and meanings it carries. It is a particular type of institution, a technical device with the generic

purpose of carrying a concrete concept of the politics/society relationship and sustained by a concept of regulation." (Lascoumes, LeGalès 2007: 4) This kind of view is close to my proposal to see policy instruments as 'designs on governance', and the need to integrate design and dynamics perspectives on governance (Chapter 2), and I will develop this further in Section 3.3. What it does not address (explicitly) is the ideology of instrumentality, and how this shapes policy practices. Thus, I must first address what I have called the paradox of instrumentality.

3.2.4 A paradox of instrumentality?

Despite fundamental criticism over several decades, and various attempts to expand the conception of policy instruments, the metaphor of policy instruments as mechanical tools remains powerful in policy practices. According to some analysts, the technical take on policy design, and the related interest in the performance of instruments, has become even more pervasive (de Bruijn, Hufen, 1998: 12). In a further step, Salamon (2002a: vii) highlights the instrumentality of (alternative) policy instruments as an explanation for empirically observed transformations in governance patterns away from a simple model of state-control: "actual public problem solving has come to embrace the collaborative actions of governments at multiple levels and both government and private institutions. The vehicle for this has been the development and widespread adoption of a host of alternative instruments".

The paradox of instrumentality in governance is thus more complex than the contrast between its being embraced in policy practices while it is debunked by analysts as a misrepresentation of political reality. Analysts and critical commentators themselves, when proposing better approaches, can still go for alternatives phrased in terms of instruments. In other words, instrumentality is still accepted as being effective, somehow. The paradox is not just one between myopic practice and enlightened analysis, but occurs also within the world of analysts.

This is where the reflexive perspective on design in governance, developed in Chapter 2, must take effect. In this perspective, rational design and political control are recognised as rhetorical claims rather than actual achievements, but are also seen as productive illusions which can motivate and orient collective action. The mechanical image of control conveyed by the 'tool' metaphor might thus exactly be the asset that makes the concept of policy instruments productive in political practice. It embodies a perspective of design on governance which excludes complexities and ambivalences that are part of real world dynamics of governance – but productively so? One could argue that these complexities, if they were addressed all the time, would make a strategic approach to governance almost impossible.

In the remainder of this chapter, I shall further articulate the conception of policy instruments as designs on governance. This incorporates both dimensions of policy instruments, the technical and the political, and thus transcends the toolbox view without doing away with the advantages of thinking and working in terms of 'tools'.

3.3 Designs on governance

A concept of policy instruments that is able to grasp the complexities of governance in the real world must not only include the aspects that are foregrounded by adherents of rationalised policy-making, but must integrate the aspects to which critique of the instrumental approach refers when it draws attention to the politics involved in the development of policy instruments as technical options and the contingencies that are involved in implementation. To this end, it is necessary to take one step back in order to acquire a view on the embeddedness of policy instruments in broader governance contexts. This requires awareness of the very processes in which instruments are constructed as technical options of governing and in which they are used as models of governance in the policy-making process ('models' in the sense that they assume and prefigure a desirable state of affairs).

The reflexive perspective on governance presented in Chapter 2 emphasises interaction between design and dynamics of actual configurations. Policy instruments as socially constructed models of policy-making *and* as actual forms of public policy that are shaped by these models, appear as an instance of this complementarity (they also contribute to it, for example when, with the emergence of a policy instruments discourse, design questions in policy-making could become more technical and de-contextualised). Thus, policy instruments have a double life, as actual configurations and conceptual models of governance. The notion of policy instruments as design on governance captures this double life: they are (somewhat de-contextualised) *designs on* governance, and at the same time part of the dynamics of governance. The notion of leading a double life can be elaborated further by linking it with a context of development (of instruments) and a context of implementation (in the real world), as I will do in Section 3.3. Instruments lead a double life also in the sense that their instrumentality might seem to be technical and neutral, but is always also a general approach to governance, as was clear in the literature review in Section 3.2. And when the other life, dynamics of evolving configurations in the world are foregrounded, there is also the reference to instrumentality as part of the dynamics.

Policy instruments as designs on governance are models for and of reconfiguring governance. As such, the development of policy instruments is driven

by tensions between dynamics in real world configurations and the promise of design that the model offers. On the other hand, development of governance is driven by design activities motivated and guided by the promise of control embodied in instruments and by their interaction with parallel activities and ongoing dynamics of structuration.

While recognising these complexities, I can still work with a two-fold concept of policy instruments:

Policy instruments as actual configurations in governance. Linked to this is the political process in which existing governance patterns are reconfigured and new institutional arrangements are created. These processes are embedded in ongoing dynamics and involve interaction with institutions, actors and ideas and their ongoing dynamics within particular domains of implementation. One could say that this is the real world appearance of policy instruments, the actual phenomenon of recognisable forms of governance.

Policy instruments as models of governance which entail a certain interpretation of political reality and a theory of how governance can be designed and certain outcomes produced. Linked to this is a process of model construction and making it robust for implementation. One could say that this is the theoretical or 'paper' appearance of policy instruments, the abstract idea of a specific form of governance with a particular function.

This conception of policy instruments constitutes a research programme on the development of policy instruments in interaction with governance. In this perspective, policy instruments appear as sites of structuration of reflexive governance. Many general questions can then be asked: What is the role of policy instruments in governance? How do models emerge in the context of broader governance dynamics? How do the models in turn affect dynamics of governance? And how do the dynamics induced by models for reconfiguring governance in turn affect the development of the models? How are policy instruments constructed in society and by this way shape society?

Such questions are a backdrop to my empirical research, which reconstructs, for two specific cases, the double life of evolving policy instruments. I shall briefly elaborate the two "lives" (which foreground design or dynamics, but do not eclipse the other component).

3.3.1 Configurations in governance

Policy instruments have a life as political practices with empirically identifiable patterns of governance. In this sense I will refer to them as "configurations that work".

The notion was originally coined to capture arrangements of material and social elements that make up technologies in use (Rip, Kemp, 1998).[21] It acknowledges that, apart from the material artefact that is often foregrounded in public debate about technology, it is actually the alignment of heterogeneous elements that constitutes technologies as working arrangements. Such elements are social and material. They include ideas and images, routines, competences and skills, the organisation of operation and maintenance processes, regulation of security and environmental effects as well as service tools, complementary devices and infrastructures for supply of inputs and disposal of outputs. These elements are aligned with each other so that they interact in a certain way and produce a performance, an expectable outcome, i.e. they "work".

Configurations are embedded in contexts; they are interlinked in a "seamless web" of institutions and artefacts. They build on certain resources provided by context (meaning, skills, conventions of behaviour, computing capacity, technical infrastructure like buildings and streets, energy, matter, landscape gradients). The configuration is socially constructed – in interaction with the own dynamics of elements of which they are composed and the parallel entanglement of these elements in other networks and configurations (which means that changes in other areas may shift elements of the configuration around). Such arrangements constitute technology in the real world, living technology that becomes part of social practice. This is especially relevant for innovation and transfer of technology. It emphasises that technology is deeply embedded in broader technical and institutional contexts and that these need to be considered if technology is to be made working.

Building on the insights of technology studies, I will outline a configurational approach to policy instruments in practice (which includes attempts to implement a design).

The configurational aspect is as important in understanding policy instruments in practice as it is in understanding technology in practice. Whereas policy instruments may appear as unitary, identical and delimitable "things" or, indeed, "tools" in political debate and academic research, they actually denote highly complex and in details also heterogeneous phenomena in political practice.

Embedding in contexts implies that the configuration interacts with ongoing structural changes. Its development and its working introduces dynamics into broader governance structures located in established policy networks, policy culture and notions of legitimacy, legal frameworks, public discourse. At the

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[21] The notion can also be applied to (socio-)technical designs: projected configurations that hopefully will work (and may work already as a demonstration or in a protected space).

same time, these meso- and macro-structures protect and nurture or put pressure on policy instruments and so create opportunities as well as constraints for their development into configurations with particular forms and functions.

Innovation, the creation and introduction of a new configuration is a complex process (for a more detailed account of innovation processes see Section 4.3 and 4.4). Present and new links between constitutive elements are crucial. To embed a new configuration and make it work, lots of reconfiguration is necessary. Implementation studies in policy have drawn up similar concepts to describe what is going on in putting policy in practice. Bardach (1977) compares policy implementation as an "assembly process" of "numerous and diverse program elements" that are "in the hands of many different parties, most of whom are in important ways independent of each other. The only way that such parties can induce others to contribute program elements is through the use of persuasion and bargaining" (36-37). What I add are technical and material elements and contexts structuring what is easy and what is more difficult to realise. "Persuasion and bargaining" are only two mechanisms for reconfiguring.

The process of reconfiguring takes place in form of experimentation. Only in the process, in direct interaction with the governance context, it is possible to find out which particular elements are needed, which ones are possible to enrol and which ones resist too strongly or are to tightly entangled in other contexts. Learning in direct interaction with the societal target domain is required. In the course of this process, it may turn out that the original design is not feasible, because it meets resistance or it produces different outcomes than desired. The instrument often has to be reinvented in order to work with the material that is actually available in practice. I discussed such shifts and the aspect of learning already in the literature overview, in Sections 3.2.2 and 3.2.3. At this point, I can locate the issues as an integral part of getting configurations that work.

The experimentation that is necessary to find out what works and what does not work does not take place in the laboratory, but in the real world and it leaves its traces there. Exploring and experimenting already interferes with ongoing dynamics of governance and shapes it. Political attempts at reconfiguring governance may therefore easily set off some dynamics which are not under control. It is as if the stone that is to be moulded into a statue does not stand still, but starts to move and transform under the hands of the sculptor. If, for example, stakeholder workshops are organised in order to consult about a policy proposal, this may create new network relations among stakeholders and either a fear of constraining regulation or hope for additional benefits so that they organise themselves proactively in an attempt to remould governance. They may even take the process out of the hands of official policy makers altogether.

The configurational approach thus highlights certain aspects and dynamics which are building blocks for a general theory of policy instruments in practice. For example, dynamics derive from five basic mechanisms:

- from activities to configure the instrument, attempts at creating alignment: link with demand for solutions to problems, link with interests of actors to build coalitions, arrange legal norms, build up databases, integrate cultural values, etc. (these activities can have intended and unintended consequences)
- from the autonomous dynamics of elements of the configuration which make them break out of their position in the configuration (e.g. change of strategies of actors, development of database technology)
- from elements starting to interact with each other (e.g. conflict between actors whose skills are needed and cultural values that are embodied to legitimise the configuration)
- from elements being unhinged or broken out of the configuration by actors who require them for alternative configurations (e.g. administrative capacities or financial resources)
- from crush, strain, deformation, replacements of elements due to shifts in context in which configuration is embedded (e.g. abolishment of general legal prescriptions on which instrument is based, erosion of legitimisation for a certain type of instrument due to cultural changes)

In addition, more broadly, reconfiguration also alters social relations. Societies may become dependent on the working of instruments which then gives a specific form of power to the experts who know to develop and operate it.

3.3.2 Models of governance

Apart from the life of policy instruments as configurations that work in specific governance contexts (e.g. feed-in tariffs for renewable energy in German electricity system, renewable obligation in UK electricity system) their other life is as de-contextualised models of governance, as abstract mechanisms, conceptual layouts or blueprints for reconfiguring existing "dysfunctional" or "messy" governance patterns. Such models can be developed in their own right, upfront, or become articulated by reflection on, and analysis of, ongoing practices. The two modes will often occur together and interact in various ways.

They become articulated as universal, or at least more cosmopolitan, models with specific theoretical underpinning and accumulated knowledge from comparative evaluation of implementation experiences. This special knowledge becomes institutionalised in expert communities which maintain and develop a model instrument as it travels across time and implementation sites.

Policy instruments as models of governance have effect in inducing and shaping reconfiguration processes in governance. The application of policy instruments in this sense is considerably more complex than the use of artefacts as "object tools". Their instrumentality works more as frames for reform processes, as visions of possible future forms of governance, as promises of particular functions, and as structured expectations.

"(P)articipants act within a context of expectations that something will happen that bears at least a passing resemblance to whatever was mandated by the initial policy decision (…) participants who favor the policy goals of the mandate use the existence of the mandate to as a moral and sometimes legal weapon in the emerging struggle over the terms on which policy is effected." (Bardach, 1977: 43) As such one can understand policy instruments as models, in analogy to the effect of expectations in technological innovation (van Lente, Rip, 1998), as prospective structures with a coordinating, an enabling and constraining effect in political interaction (third grade structuration).

While policy instruments are not tools in the sense of fixed structures with a specified performance that can be picked-up and transported to other contexts, such fixed structures might not even exist for technical artefacts.[22] Disco and van der Meulen (1998a: 323) introduce the notion of a 'resilient mobile', an artefact which maintains his performance, often with the help of local adaptation and repair work. Similarly, cognitive frames and argumentation structures that serve as models in reconfiguring governance structures can work as 'resilient mobiles', and used that way in political debate and in constructing institutional arrangements.

An important difference with artefacts as technical tools is that actors who apply these policy instruments as frames for institutional reconfiguration are often themselves part of the "material" from which a new configuration is built (cf. above, Section 3.3.1). Applying models of governance often implies a redefinition of the roles, positions and relationships of political actors.

Using the notion of models of governance opens a further range of questions. Who produces the model? How does a model become a design option for reconfiguring governance in concrete contexts? Politically these questions are all the more important as policy instruments tend to become "naturalised", i.e. they are attributed an objective existence, a quality independent of the domain of application, and become a force of their own in the policy process. This implies that a relevant part of policy processes takes place in the construction of the model. If policy instruments are conceived of as neutral mechanical tools, this part of the policy process remains invisible. Especially for understanding

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[22] "what actually diffuses is not the local practice … or even the innovative artifact itself, but some resilient and mobile representation of it" (Disco, van der Meulen, 1998a: 326).

governance change over extended time periods and across domains, however, it is important to take into account, how the options that are available for policy making come into being and how they become legitimised or delegitimised in a technically framed discourse. "(T)he process of 'naturalization' or neutralization of policy instruments is one of the most intriguing questions for public policy analysts, and it requires a focus on power and interests. But a policy instrument is not a given, and it may face delegitimation over time-again, an interesting process to analyze. The whole point of focussing on policy instruments is also to make visible some of the invisible-hence depoliticized-dimensions of public policies." (Lascoumes, LeGalès 2007: 17)

3.4 Empirical research on the double life of policy instruments: follow the instruments!

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.

This also provides a general frame for empirical research and the preceding sections offered a number of building blocks for a general theory of policy instruments in practice which also lead to hypotheses and questions for empirical research. This can be visualised as in Figure 1.

The overall approach thus gives rise to three different complexes of questions with regard to policy instruments and their role in governance:

1) the life of policy instruments in the context of implementation: how do configurations that work develop? What role do models play?
2) the life of policy instruments in the context of development: how do models develop? What role do configurations play?
3) the double life of policy instruments: how are emerging designs related to dynamics in reconfiguring governance? How do development and implementation interact?

The character as social constructions as well as their character as tools in political discourse is recognised. The interplay of both actually offers a new and better understanding of governance as it combines the design and dynamics perspective for concrete empirical process studies. Policy instruments thus figure as research sites for understanding reflexive governance in practice.

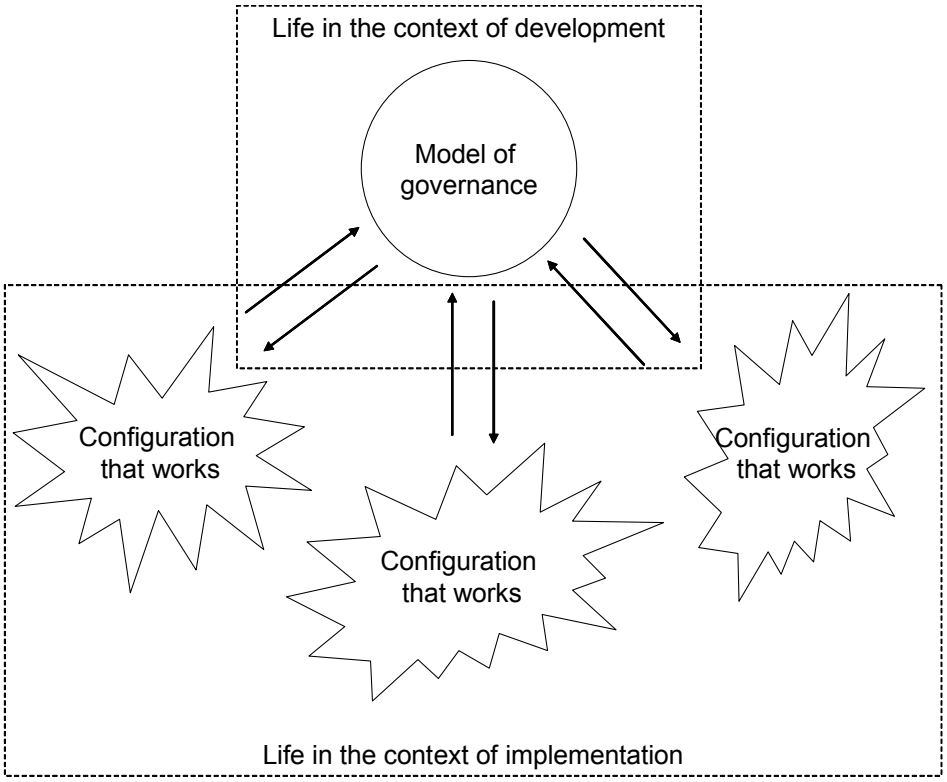

Figure 1 The double-life of policy instruments

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 chapter.

In other words, understanding the development of policy instruments as designs on governance implies a shift in perspective, from governance domains as a unit of analysis to the (evolving) instruments themselves as a unit of analysis and to follow them along their double-life-course which may lead across countries and policy fields.

The standard approach in policy studies is to take governance domains as the unit of analysis. Governance domains are defined by issue area and jurisdiction, e.g. environmental policy in Germany, global climate policy, California

energy policy. Policy change is investigated as problems moving on and off the agenda, actors moving in and out of positions of authority, and policy instruments being chosen and discarded.

The life of policy instruments does not exclusively depend on a governance domain, however. The journey may actually lead through different governance domains which are host to the instrument for some time and provide a specific environment for further development (in the diagram below I visualise such movements). Likewise, instruments may link up with various problems and political interests over the course of their life. Instead of being taken as cause and end of instrument choice, governance domains appear as medium or sponsor for development, if viewed from the perspective of instruments.

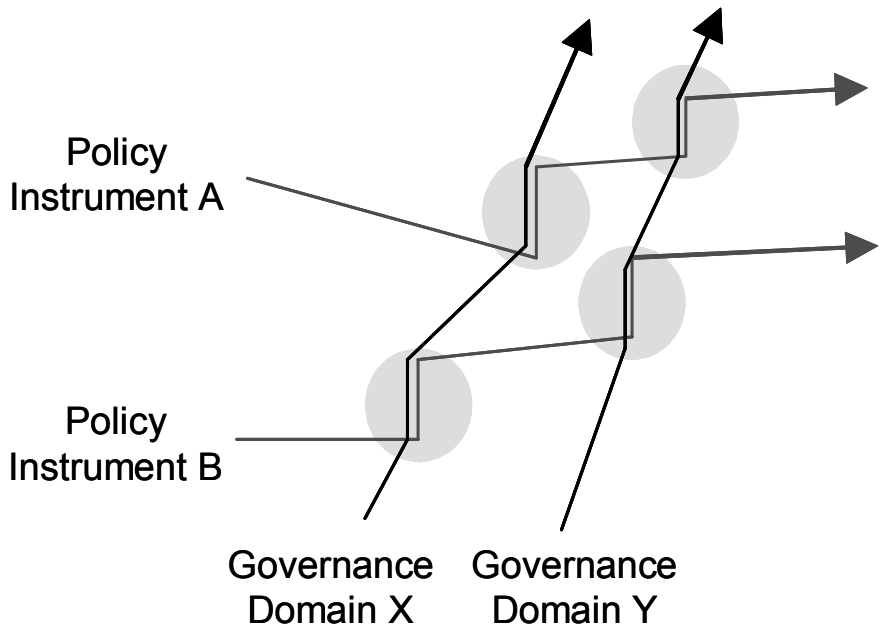

Figure 2 *Development of policy instruments across governance domains*

Taking policy instruments as the unit of analysis, and following them from their origins along their double-life course is thus of central importance in order to understand their instrumentality, and how it co-evolves with wider changes. The

injunction for empirical research is then: Follow the instruments! Actor-Network Theory has pressed the need to follow the actors (Callon et al., 1986) and showed in case studies how this offered new understanding. There are now also many case studies of following the artefact (Law, Callon, 2000/1992). I add 'follow the instrument' to this list, with the caveat – as is clear in the artefact studies, and was discussed in Section 3.3.1 – that there is no instrument given as such that can be followed unequivocally. This is where the concept of 'innovation journey' comes in, because it starts out in situations where it is not clear what the innovation is, or whether there is an innovation at all.

4 Development of policy instruments: innovation journeys in governance

4.1 Introduction

To develop an analytical framework for studying policy instruments as designs on governance, I can build upon the analysis in the preceding chapters. Design was portrayed as embedded in, and entangled with, dynamics. Policy instruments can then be positioned in a way that goes beyond the metaphorical understanding as tools of government. As designs on governance, policy instruments support a productive illusion of control in governance. They orient and coordinate collective attempts at shaping societal developments by offering a concrete promise of control. They do this by specifying institutional configurations and performances, including steps that have to be taken to make them work. At the same time, they enable policy learning exactly because ongoing distributed design work can now be related and rationalised with regard to a planned configuration, so that cumulation of experience and insights are possible. Thus, I could continue and show how design takes place as a dialectic process of modelling and conducting experiments with reconfiguring governance patterns in the real world.

The paradox of policy instruments that I haven taken as a starting point for the thesis (and elaborated in my review of policy instruments research) could then be transformed into a more encompassing – reflexive – concept of policy instruments which comprises "two lives": policy instruments as models of governance and policy instruments as actual configurations in governance. Instead of a fundamental confrontation between the heroic ideal of designing 'institutional artefacts' with a specified functionality, on the one hand, and the complex and messy reality of politics and institutional dynamics, on the other hand, the paradox becomes a well-known ambiguity of design. This is the difference between envisioned function and eventual embedded structure. Between these two there is a productive tension that motivates engagement with ongoing dynamics and enables learning from experience. Part of the ambiguity of design in general and of policy instruments in particular is that modelling (the envisioned function) may not be realised, or may not even be taken up in the reconfiguring of governance (embedded structures). The discussion of policy instruments in the literature usually refers to generalised and idealised model configurations of governance so that there is an in-built, and not always visible, tension with processes and outcomes in concrete contexts. The notion of designs *on* governance foregrounds this tension.

Instead of taking policy instruments as given and focus analysis on choice and effects of application (theoretically, in model simulations or real world implementation), the *development* of policy instruments must come into focus. 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.

In a first step, I briefly make an excursus to review some strands of policy studies with a view to building blocks that may lie in there for the analysing the development of policy instruments. I then introduce the concept of an innovation journey as a heuristic device for studying the development of policy instruments. Innovation journeys of policy instruments are embedded in broader contexts, and the interactions can be conceptualised with the help of a multiple-stream model of governance dynamics. Theoretically, one can then identify different types of innovation patterns, depending on which of the streams is taking the lead in the interactions. I will distinguish two such patterns, and these will be used for the selection of case studies in the subsequent chapter.

4.2 Building blocks from policy studies

Since an innovation journey is not limited to a specific domain, it is useful to first review studies of the development and change of policy instruments, especially those which are not specific to a domain, for example studies of policy diffusion and policy learning, and identify relevant insights.

First, there are concepts that developed from *implementation studies*, which try to make sense of the dynamics that occur after a policy has been officially decided (Sabatier, Mazmanian 1980: 540). An important insight is that policies and the instruments used in the design of action programmes often undergo considerable change in the process of implementation. One reason is that political action programmes are often drafted far away from the agencies that have to implement them and the contexts in which they shall take effect. A major issue is thus how policies undergo change, produce unintended consequences and may fail when they are put in practice. This is captured in the no-

tion of "implementation as evolution".[23] The irony of design in an evolutionary process is highlighted by referring to "implementation monsters — policy outcomes bearing no recognizable relationship to the original idea" (Majone, Wildavsky, 1978:111). This is relevant for the development of policy instruments, because it shows part of the interaction between models and governance dynamics, also at a fundamental level: "the attempt to study the implementation raises the most basic question about the relation between thought and action: How can ideas manifest themselves in a world of behaviour?" (Majone, Wildavsky, 1978:103).[24] Implementation studies thus offer building blocks, but mainly about certain short stretches of the development process, and they are sometimes constrained by the need to separate goals and means.[25] What the implementation studies approach cannot offer is insight in the interaction of models with policy design (as this happens before implementation start). They also do

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[23] "Implementation is evolution. Since it takes place in a world we never made, we are usually right in the middle of the process, with events having occurred before and (we hope) continuing afterward. At each point we must cope with new circumstances that allow us to actualize different potentials in whatever policy ideas we are implementing. When we act to implement a policy, we change it. When we vary the amount or type of resource inputs, we also intend to alter outputs, even if only to put them back on the track where they were once supposed to be. In this way, the policy theory is transformed to produce different results. As we learn from experience what is feasible or preferable, we correct errors. To the degree that these corrections make a difference at all, they change our policy ideas as well as the policy outcomes, because the idea is embodied in the action." (Majone, Wildavsky, 1978: 114)

[24] The starting point is that "Policies imply theories. Whether stated explicitly or not, policies point to a chain of causation between initial conditions and future consequences. If X, then Y. Policies become programmes when, by authoritative action, the initial conditions are created. X now exists. Programs make the theories operational by forging the first link in the causal chain connecting actions to objectives. Given X, we act to obtain Y. Implementation, then is the ability to forge subsequent links in the causal chain so as to obtain the desired results. (…) Once a program is underway implementors become responsible both for the initial conditions and for the objectives toward which they are supposed to lead" (Pressman, Wildavsky, /1973: XV)

[25] In defining their object of study implementation studies struggle with analytically breaking down the notion of policy into goals and means: "policies normally contain both goals and the means for achieving them. How, then do we distinguish between a policy and its implementation?" (Majone, Wildavsky, 1978:103). Later applications of implementation studies explicitly refer to the changes that policy instruments undergo in implementation (Bressers, Huitema 1996)

not include the feedback-loop of learning from implementation for the model (as this happens on another scale and after the implementation process).

Another relevant strand of research are studies of *policy diffusion and transfer*. They actually make the shift to follow instruments (in this case, 'policies') across the borders of domains. They do not go far enough, however. Diffusion studies track policies as they occur across various governance domains (Walker 1969; Tews 2002; Tews et al. 2003). The analysis is static in the sense that explanation for these patterns is sought by correlating variables of governance domains (including relational variables) with the point in time where a policy became adopted. Thus, "leaders" and "laggards" can be identified and hypothetical conditions for the "innovativeness of pioneers" be articulated and statistically tested. The process by which a policy travels across domains, however, is left unexplored theoretically and empirically.

Policy transfer studies are different in this regard. Here, the focus is on the process by which policies become transferred from one domain to another (Dolowitz, Marsh 1996; Rose, 1993). The approach is to examine how the process of policy design (including adoption of instruments) in one focal domain is (or should be) influenced by the example of other domains. The focus is on the transfer of policy ideas, their adaptation to fit the 'target' domain's specifications and the role of various actors within this process (Smith 2004). While this is a perspective which brings up many relevant insights for the development of policy instruments, it suffers from an undifferentiated concept of policies and policy ideas (Dolowitz, Marsh 1996). Transfer appears as a diffuse process in which elements like problem definitions, instruments and strategies of political actors can spill over from one domain to another or are actively picked up and emulated by policy-makers in an attempt to learn from elsewhere. Instrumental models of governance are not articulated as specific elements within the transfer process. Another reason why transfer studies cannot offer a full conceptual account of the development of policy instruments is that they, in a similar way to implementation studies, only cover a short stretch of the developments. The studies restrict their analysis to one-off transfer processes. Analysis does not include the question where policies had come from in the first place, before they were adopted in the 'source' domain, or how they continue their development in the target domain which can then become a source domain for further transfer and learning that builds on adaptations of the policy in the transfer process.

Policy learning offers a perspective in which the accumulation of experience and know-how across several instances of policy-making becomes thematised. Studies of policy learning, however, tend not to focus on instrumental aspects of policy, but on general problem frames and related policy goals that are embodied in basic beliefs and ideology. Even if policy change is materially observed as a change in instruments, for example, as a trimming of existing

instruments or exchange for new ones, this is related to a shifts in problem perception and related reordering of policy goals (Howlett 1992; Hall 1993; Howlett, Ramesh 1993; Jenkins-Smith, Sabatier, 1993).

These types of studies appear to deliver complementary insights and building blocks to understand some parts of the development of policy instruments. Elements from these strands of policy research will be useful for conceptualising processes of policy instrument development. Clearly, however, these approaches do not suffice to provide a conceptual framing of the overall development process. For this I have to go beyond the realm of established research perspectives in policy and governance studies, and will draw on innovation studies.

4.3 Development of policy instruments as innovation processes

There is some resemblance of the development of policy instruments as I envisage it here with processes of innovation as studied in social studies of technology, where the path of artefacts are followed. And designing technology involves a similar tension between model and working configuration in real world contexts (Kroes 2002). There is also a more philosophical discussion of the issue of the instrumentality of technical designs as linked to an ideology of control.

Innovation processes, whether studied in history[26] and social studies of technology[27] or in evolutionary economics of innovation[28], are seen as entanglement of design and dynamics in the same way as I discussed for governance in Chapter 2. Innovation comprises goal-oriented strategic action and deliberate shaping of reality as well as resistance and ongoing dynamics of the world in which the innovation process is pursued. 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 inter-

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[26] (Hughes, 1983; David 1985)

[27] (van den Belt, Rip, 1987; Kemp et al., 2001; Mayntz, Schneider, 1995; Rammert 1997; Edquist, 1997; Stokes, 1997; Rip, Kemp, 1998; Schneider, Werle, 1998; Bijker, Law, 2000/1992; Grunwald, 2000; Geels 2001)

[28] (Nelson, Winter, 1982; Mulder et al. 1999; Clark, Juma, 1987; Arthur 1989; Dosi et al., 1988; Rycroft, Kash Don E., 1999; Nelson, 2000)

actions. This is the dynamics part. Thus, innovation is indeed a process of iterated interaction of design and dynamics. Redesign, repair and even shifts in function are common in innovation processes.[29] This is how innovation is different from imposing a plan, on the one hand, and different from subsuming to dynamics by passively drifting with them, on the other hand.

So, 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. To decide which concepts to import from the studies of technological innovation, I cannot fall back on existing conceptual work on patterns and dynamics of innovation processes in governance. 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, 1998b/1996b; 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.

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. 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.

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).[30] The notion of

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[29] Innovation is not intrinsically related to improvement. Effects of innovations are likely to be judged differently by the various actors concerned. Some actors may follow innovations for their aesthetic or symbolic value or for the business potentials connected to them rather than their substantial effects on the outcome of social interaction.

[30] Actor network theory abolishes a conceptual difference between the social and technical right away. Their notion of technology as "actor-networks" emphasises the different ways in which elements mutually influence and position each other, irrespec-

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.[31] This immediately makes it a location and a medium of politics and eliminates a fundamental distinction between rational technology and contestable policy.[32]

In such a 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 (see Section 3.3.1). The essence of technology development then comes 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, 1998b).

For some authors, technology studies come close to a general theory of social change: "scientific and technical creation, as well as the diffusion and consolidation of its results, stem from numerous interactions between diverse actors (researchers, technologists, engineers, users, industrialists). The problem then arises of analysing these interactions and accounting for the choices made. How can we explain the fact that in certain cases, trajectories are successful and stabilize, whereas in others new configurations appear?" (Callon, 1992: 72). These more recent concepts of technology development provide something like a general approach to study trajectories in societal development. Callon (1992: 72) writes further: "The analysis of science and technology lies at the heart of the

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tive of them being conventionally considered as human or non-human. Technology is, in the first place, a matter of arranging and aligning, stabilising and making predictable, of programming courses of action (Latour, 1992).

[31] See Disco and van der Meulen (1998c: 6) for a discussion of the difference to 'socially' constructed.

[32] The latter was a distinction that was accepted by both camps in debates about the appropriateness of socio-technology in the 1970s (e.g. Maciejewski, 1974).

debate about irreversibility, or perhaps what should be called the processes of irreversibilization and reversibilization."

This reinforces my general point that insights from science, technology and innovation studies can be imported and support the study of policy instruments as designs on governance. Thus, the insights in the formation and stabilisation of trajectories, alignment of networks in mutual adaptation of designs and dynamics and a general concern for emerging irreversibilities and the precariousness of functioning orders, can be used to study and understand emerging trajectories of policy instruments as designs on governance.

The first "importation" is about trajectories. There is a long tradition in technological innovation studies to reconstruct the emergence and stabilisation of novel configurations and designs. A common approach is to differentiate phases of the innovation process such as genesis, implementation and stabilisation (e.g. Weyer et al., 1997). While such a linear model of innovation has often been criticised for neglecting the complexities of innovation processes that include iterations, setbacks and shifts it can still be a useful heuristic. That is, when it is not taken to impose a logical order on the unfolding of events, but to present a sequence of critical passage points and transitions that occur along the innovation process and are directly linked to mechanisms and patterns of gradual articulation of a new trajectory and its growing irreversibilisation.[33] Such a concept is represented by the notion of 'innovation journey' as introduced by van der Ven et al. (1989; 1999) and further developed by Rip and Schot (2001; 1999). I pick this up and adapt it for the analysis of development of policy instruments in the next section.

The second "importation" is more general about innovation: when novelty emerges in socio-technical configurations there will be de-alignment (with respect to what exists) and re-alignment (to create a new order). In action terminology: it involves putting together new combinations, creating connections and linking up elements as well as releasing elements, disrupting connections and creatively destructing existing structures, as Schumpeter emphasised.[34] For innovation in governance this implies that elements which are required for a new arrangement must be released from their entanglement in existing configura-

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[33] A phase model of the innovation process can then be taken as a sequence of critical transitions that can serve to collect and structure data for the empirical reconstruction of any innovation process that is taken as object of study. The actual outcome from the empirical reconstruction may still be a much more complex pattern of which iterations, disaggregation, redundance and failures may well be a part.

[34] Actor-Network Theory has introduced a whole set of special concepts (a vocabulary of translation, enrolment, circulation) for analysing interactions with respect to the creation of alignment and gradual irreversibilisation of network configurations.

tions in order to be put together in new combinations.[35] For novelty to emerge and prosper there must be free elements floating around and spaces within which they can enter first tentative alignments that create some kind of promise or other positive feedback with their environment. For the eventual unfolding of new configuration, further elements and resources must be disentangled from former functional connections and spaces must become larger and provide protection from immediate pressure to perform.

For policy instruments this means that early development can be expected to involve free capabilities, resources, elements of theory, needs for problem-solving, etc. that are not already incorporated and occupied by other more established policy practices. Such developments can further be expected to take place within niches with respect to established governance structures. With further development and expansion growing alignment within the new configuration goes in hand with de-alignment of existing configurations in order make available resources and to widen spaces. In general, innovation processes can be mapped and analysed in terms of occurring alignments. Over the course of the innovation process dynamic patterns arises which can be interpreted as phases in which a new design gradually cools down, hardens, stabilises, closes down and designs converge, as well as phases in which it heats up, softens, becomes fluid, opens up and designs diverge (Callon, 1992).

A third "importation", again of a general nature, and linked to the importance of processes of de-alignment and re-alignment, is that innovation requires interaction between heterogeneous actors. Multi-actor processes, distributed agency, etc. are key terms, and this contradicts the common image of single inventors whose ingenuity and heroic struggle explain the success of an innovation. Heterogeneous interaction as a requirement for the success of an innovation means that actors with diverse resources, worldviews and interests are involved, in cooperation as well as conflict. "Getting new technologies together" is a social process (Disco, van der Meulen, 1998b; Dolata, 2003). With regard to policy instruments as societal technologies, this points towards the relevance of specific constellations of actors and forms of interaction. There is obviously a direct link here to established conceptual frameworks of policy analysis. Studies of technological innovation sometimes distinguish typical roles of actors with specific relations such as users, developers, scientists, sponsors, service providers, regulators, affected third parties, etc. Similar roles could perhaps also be distinguished in the development of policy instruments. A key role is assigned to entrepreneurs and system builders (Hughes, 1987) as actors whose role is to

[35] Compare Bardach (1977: 37) on policy implementation as "a process of assembling numerous and diverse program elements".

draw out connections and link up elements, actors and ongoing processes. Kingdon (2003/1995) has identified a similar role for policy entrepreneurs in the process of agenda building in the realm of governance.

As a corollary, there is no need for consensus or not even for complete mutual understanding of all actors that are involved and contribute specific skills and resources. Rather, especially in early phases of technology development, there is a high degree of "interpretive flexibility" as to what the purpose and function of configuration is going to be. Users actually want it to work (for whatever purpose they attach to it). Developers, sponsors and financers, however, may just want it to be successful, i.e. to meet some kind of demand and pay back investments in development. Scientists may want to see their ideas realised etc. Often technology development builds upon an ambiguous agreement between actors. They agree on what should be done next, which elements should be put together (and other configurations destroyed from which they are taken), but they need not agree on the "why" or the "what for". Each may interpret the project and its purpose in a different way, focus on different effects and follow her or his own interests by being involved. Here, one can also find a clear parallel with findings from studies of institutional and policy change (March, Olsen, 1989: 83; Palier 2007: 97).

A further implication of viewing technological innovation as a social interaction process is that similar social dynamics can be expected to play a role as in other areas of social interaction. So while I pick up concepts and insights from technology studies here, I also mobilise insights from studies of institutional and policy change (it should therefore be listed as third-and-a-half importation).

Several actors who are concerned with an innovation, or a new policy instrument for that matter, may become linked up with each other in repeated interaction. This means that actors can develop stabilised relations, form networks and give rise to the emergence of institutions as they interact in technology development (Weyer et al., 1997; Dolata, 2001). Also for policy instruments, actors may form networks centred on a particular design, and come to evolve into a community of practice that share experiences and concepts up to professional groupings and expert communities with specialised knowledge and skills with respect to a special design[36] Braithwaite and Drahos (2000: 501) introduce a similar concept when they speak of "regulatory communities" and

[36] While innovation networks have some similarity to what is described as epistemic communities (Haas 1989) or advocacy coalitions (Sabatier, Jenkins-Smith, 1993), there is an important difference. Whereas networks identified in policy studies are constituted by common ideas about problems and goals, innovation networks, as I understand them here, centre on particular instruments, i.e. certain designs and forms of configurations in governance.

their role for the emergence of global business regulations. These transnational communities may comprise adversaries on policy goals who are "comrades" in technology: "They have learnt a transnational regulatory discourse so they can all engage in constructing global institutions. One is trying to tighten a screw while another seeks to loosen it, but they work on the same scaffolding and make decisive compromises from time to time on how many turns of the screw there should be before they leave it for a period."[37] Sometimes regulatory communities split up if different designs come up and develop their own constituency (Braithwaite, Drahos, 2000: 503).

Within networks of actors that interact on the basis of a common concern for a policy instrument general social dynamics occur as were characterised in Chapter 2 as three grades of structuration. Repeated interaction can lead to mutual adaptation and emergence of patterns; these can become institutionalised and may become reflected upon and object of collective attempts at modification. This is how expert communities may develop common paradigms, specialised organisations and institutions such as standards of good practice, etc. In this way, innovation networks may develop specific path-dynamics with important influence on the development of policy instruments. This is the point at which one can speak of technological regimes or technological innovation systems (Carlsson, Stankiewicz 1991). A similar point is made by Lascoumes and LeGalès (2007: 9) with regard to policy instruments: "Once in place, these instruments open new perspectives for use or interpretation by political entrepreneurs, which have not been provided for and are difficult to control, thus fuelling a dynamic of institutionalization".

A further element of such dynamics, which is important to my overall analysis because of my interest in models of governance, is brought out by Braithwaite and Drahos (2000). They do not analyse technological innovation, but the development of global business regulations, something they conceptualise in a similar way as I conceptualise policy instruments. Yet, they come up with a set of mechanisms from their empirical studies which can easily be weaved into a concept of policy instruments as innovations in governance. They distinguish coercion, systems of reward, modelling, reciprocal adjustment, non-

[37] Regulatory communities usually start with professions, they are paraphrased as "epistemic communities of governance" (Braithwaite, Drahos, 2000: 502) Usually scientists dominate, they explain this with the aptness of scientific discourse as a common language that can bridge political and cultural differences: science is the infrastructure for political adversaries to communicate. NGOs are sometimes part of the team working on the "scaffolding"; sometimes (or some of them), however, they may not accept the scaffolding as such and want to throw it over. This is the case in the community for nuclear regulation (501).

reciprocal coordination and capacity building. A central one, which I want to highlight and pick up later, is "modelling". They describe it as a form of 'framing' policy discourse (Rein, Schön, 1993) by creating, copying, adopting and reproducing certain model images of business regulation. "Modelling" thus produces convergence in "webs of regulation", it contributes to the establishment of new regulatory forms by the diffusion of shared mental images. Modelling appears so central to them that they continue to differentiate various roles that actors can take on in the process: model missionaries, model mercenaries, model mongers, model misers and model modernisers (Braithwaite, Drahos, 2000: 15).

A fourth "importation" continues with some of the broader interactions, and leaves the focus on the 'inner working' of innovations. There is interaction of novelty with existing contexts and ongoing developments. Novelties, up to new rule systems, can be conceptualised in evolutionary terms as variations which are introduced into a context which works as a selection environment. The context offers positive and negative feedback relations which may help the variation to prosper or suffocate it. Translated to the realm of governance this may be mutual reinforcement with existing policies that build on the same basic rationale and require similar operational routines in public administration.

In innovation processes, selection pressures are anticipated. This makes innovation different from biological evolution. It can be termed a quasi-evolutionary process (Rip 1992). That means that variations are strategically produced, for example to fit anticipated selection pressures. Anticipation is not a straightforward activity, however. It is a social process, including strategising, self-fulfilling prophecies, etc. Expectations and politics of expectations therefore play a central part in innovation processes. Actors adapt configurations to fit selection environments, but they also try to manipulate contexts and modulate ongoing changes so as to create favourable selection conditions or open up spaces within existing context structures in which their innovation can grow.

The context of innovation itself is undergoing change which is to some degree the result of other parallel innovation processes (e.g. new framings in public discourse on problems or founding of a new party stirring up established politics). Such parallel innovations can be complementary and competing. In general, innovation co-evolves with its selection environment, and when trajectories emerge these are actually coupled to evolving selection environments.

4.4 Innovation journeys of policy instruments

The concept of an innovation journey was introduced by Van de Ven and co-authors to capture the open ended nature of innovation processes (Van de Ven et al., 1989; 1999). It captures the unfolding of novelty in a sequence of events.

The notion of innovation journey provides me with a frame to track the development of instruments over time and map out a general pattern in terms of phases. This also helps me to identify crucial points in the process which require further detailed analysis.

The challenge is to reconstruct the sequence of events in which policy instruments, as we know them today and as they tend to be taken for granted, have come into being. For understanding the process, it is important not to linearise the journey with hindsight and focus only on what proved to have further effects and came to be interpreted as success. At every stage in the development of an instrument the future was still open. For understanding innovation processes it is important to take account of the uncertainties, alternative options, contested notions that were around. Especially the elements of a journey that do not linearly lead up to the state of affairs that we find today are important to understand innovation: couplings where different strands of development link up with each other, forks where designs diverge onto alternative roads of exploration, shifts where form and/or function of an innovation are adapted to new circumstances and opportunities, and setbacks where certain paths of development turn out as failure.

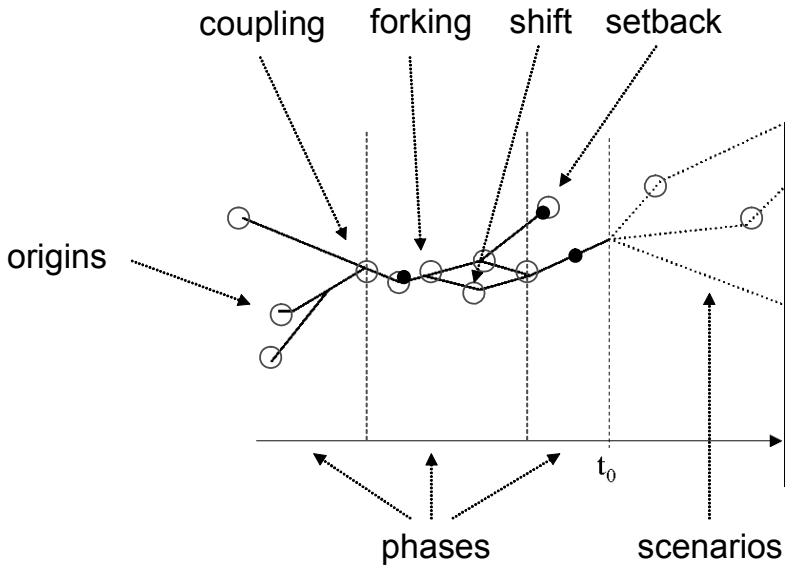

Figure 3 *Mapping the innovation journey of policy instruments*

Figure 3 visualises how an innovation journey for the development of policy instruments can be reconstructed. In addition to the elements that were already mentioned it includes scenarios as projections of possible continuations of the journey into the future.

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 (2001; 1999), which is useful for my purposes. Since they developed the innovation journey concept with respect to material technologies/products which are produced and used in a commercial environment, their innovation journey concept still needs to be adapted for the application to policy instruments. Whereas for material technology it is appropriate to map emerging networks between the poles of science, technology and markets, this obviously needs to be modified for the analysis of innovation in a non-commercial environment. I will conceptualise innovation journeys of policy instruments as emerging from network interactions between the poles of science (including social science), policy development, and governance domains as particular areas of application. Relevant areas of science include economics, law and the social sciences. Policy development comprises policy analysis in national and international public and private organisations as well as service provision by, for instance, law firms, banks, public relations agencies and software developers. Governance domains are policy areas within specific jurisdictions, on specific levels of governance, with given policy patterns, actor constellations, institutions, material technical and geographical conditions (e.g. USA clean air policy or global climate policy).

With these modifications, I can still distinguish the typical phases of the innovation journey, now with regard to policy instruments:

A phase of *gestation* brings up precursors in the form of new options, 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 of 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 articu-

lated, 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*.

Having modified the original (Rip, Schot, 2001) layout of the innovation journey, we can summarise it in a diagram similar to the one they provide, but now indicating characteristic events and activities in the three "poles" of (social) science, policy development and governance domain Figure 4.

	science	policy development	governance domain
new options	theories and mechanisms of social dynamics	identification of promising opportunities for policy development	pressure on existing governance, ad-hoc adaptations of political practice
protected space	re-orientation of R&D agendas	articulation of promises, mobilisation of resources	articulation of demand and requirements
development	problem-solving on details of design	developing a configuration that works within protected space	limited checks on political support and legal framework
prototype	trouble shooting	adaptation, first implementation	enrolment of pioneer users and political sponsors
introduction	evaluation, rationalisation	public promotion and demonstration of feasibility	adaptation of routines, establishment of maintenance infrastructure
diffusion	monitoring	extending the network, establishing standards	linking niches, modulation of context
regime formation	new questions	institutionalisation, linkages, establishment of paradigm	Shifting governance structure

Figure 4 *Critical steps in the innovation journey (adapted version for policy instruments based on Rip, Schot, 2001)*

The diagram provides a stylised view of what is obviously a complex process. A problem with the diagram is that it does not visualise shifts and iterations which are the stuff of innovation journeys in the real world. Thus, there is an impression of a linear sequence over time, which is not intended. Phases may overlap, be interrupted by setbacks, fork out into different parallel paths of de-

velopment. The concept of an innovation journey can take this into account; it is broader than the visualisation. Still, the diagram is useful as a structured listing of processes and mechanisms, and importantly, it draws attention to critical transitions for an innovation to go through in order to stabilise and become embedded.

Another addition to the diagram has to do with the fact 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.

Then there are broader landscapes in which technological evolution, in our case, development policy instruments, takes place. The landscape comprises general political discourse, constitutional law, technological developments like diffusion of information and communication technology, demographic development, environmental changes such as resource depletion, erosion or climate change. The landscape can stabilise earlier and presently evolving regimes or put pressure on them. Niche developments can bypass existing regime in drawing resources, legitimacy etc. by linking up with developments at the landscape level, and so increase pressure for change on the existing regime. An example of the latter are various experiments with electric vehicles, as analysed by Hoogma et al. (2002), which pushed the existing automotive regime into some response.

The discussion of concepts from the study of technological change and innovation has indicated patterns of how design and configuration work relate to each other and how these relations change over the course of time. It has also shown how successful configuration work may lead into the cosmopolitanisation of designs and emergence of policy instruments as universal blueprints for governance which can then diffuse to other contexts of implementation.

The innovation journey concept provides a heuristic for analysing the development of policy instruments as the emergence of a trajectory in connection with specific designs on governance. This is an important step. What is not visible yet is how to include the broader context within which the development of

policy instruments as "societal technologies" takes place. As I have already noted, there is the part of context that is constituted by established policy instruments and regimes of governance. The development of new policy instruments is enabled and constrained by these pre-existing technological structures. More importantly, the governance world does not circle around instruments and technology. Other relevant dynamics such as the appearance of new problems in public perception or the struggling of political groupings to occupy positions of institutional authority can be more important, even if the ideology of instrumentality (cf. Chapter 3) will always play a role. One way to position dynamics of policy instruments into a broader dynamics is with the help of a multi-stream model, as I will do in the next section.

4.5 Policy instruments in a multiple stream model of governance dynamics

Few approaches in governance studies grant policy instruments an independent role within broader dynamics of policy and governance change. Mostly instruments are positioned as playing a secondary role to broader beliefs, ideology and policy goals. Accordingly they do not feature as a prominent factor in analysing change – unless it is in a prescriptive perspective as with research on policy instruments as support to policy-makers. A more symmetrical treatment is offered by the multiple-stream model of policy change presented by Kingdon in an analysis of agenda building on the federal level in the USA (Kingdon, 2003/1995). This model comprises three independent streams as more or less autonomous sub-processes of the policy process. One of these streams is what Kingdon calls the "policy stream". This is where he locates the development of policy options, or solutions, on their own terms and independent of problems and general political struggle.

I will build upon Kingdon's model and adapt it in order to create a broader picture within which the innovation journey concept of policy instrument development can be embedded. I do this by positioning innovation journeys as specific trajectories within a stream in which solutions for possible and actual policy problems are developed. This leads me to conceptualise the relationship between policy instrument development and broader governance dynamics as co-evolution. Firstly, I briefly introduce the multiple stream model as Kingdon developed it and then I present my adaptations and the linkage with the innovation journey concept.

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).

What is important and has been subject of some debate, because it is in conflict with established conceptions of policy-making as rational problem-solving, is that each of the streams is conceptualised as "having a life of its own", "to obey its own rules and flows largely independent of the other" (Zahariadis, 1999: 81).

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). This allows him to open the black box of the political system and work out how collective choice comes about as result of interwoven dynamics in which actors and their strategies play an important part, but do not have a determining role as rational planners or controllers. The system as such is constantly evolving (Zahariadis, 1999: 74). This view is very much in line with what I have articulated as a reflexive concept of governance in Chapter 2. Additional to these similarities on a general level, the multiple stream model also provides a good starting point for analysing the dynamics of policy instrument development in a broader policy context. The conception of a separate stream of policy development invites one to 'zoom into' the policy stream and carry out more sophisticated analysis of the development of policy options and proposals as a process in its own right.

Kingdon describes the dynamics within the policy stream as the eternal boiling of a "policy primeval soup": "The generation of policy alternatives is best seen as a selection process, analogous to biological natural selection. In what we have called the policy primeval soup, many ideas float around, bumping into one another, encountering new ideas, and forming combinations and recombinations. The origins of policy may seem a bit obscure, hard to predict and hard to understand or to structure. (…) Through the imposition of criteria

by which some ideas are selected out for survival while others are discarded, order is developed from chaos, pattern from randomness. These criteria include technical feasibility, congruence with the values of community members, and the anticipation of future constraints, including a budget constraint, public acceptability, and politicians' receptivity. (…) There is a long process of softening up the system. Policy entrepreneurs do not leave consideration of their pet proposals to accident. (…) In the process of policy development, recombination (the coupling of already-familiar elements) is more important than mutation (the appearance of wholly new forms). Thus entrepreneurs who broker people and ideas are more important than inventors. (…) The long softening-up process is critical to policy change. Opportunities (…) pass quickly and are missed if the proposals have not already gone through the long gestation process before the window opens." (201)

Kingdon gives some more details about the processes within the policy stream as he points out the relevance of experts clustered in "policy communities" with different degrees of fragmentation (117), refers to the "Inherent power of ideas" (125), and points out that specifying "technical feasibility, value acceptability, anticipation of future constraints" as criteria for the survival of policy proposals (131). He also hints at specific forms of "external relations" maintained from within the policy stream. Here, he shows how policy experts strive to "soften up" the policy environment for their "pet proposals" (128) and how specific institutionalised interfaces work as a filter for policy proposals to be picked up in the policy process (139). Kingdon does not provide us with a more systematic conceptualisation of these quasi-evolutionary processes within the policy stream. This is where Kingdon's multiple streams can be fruitfully combined with the innovation journeys of policy instruments.

Before I can merge the two conceptualisations, 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 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 with tech-

nologies 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. What was depicted as "governance domain" in the conceptualisation of an innovation journey of policy instruments can be specified as a dynamic environment driven by interaction between streams of problems, authority and technology. Linkage and embedding of policy instruments refers to problems, authority and technology within particular contexts of implementation.

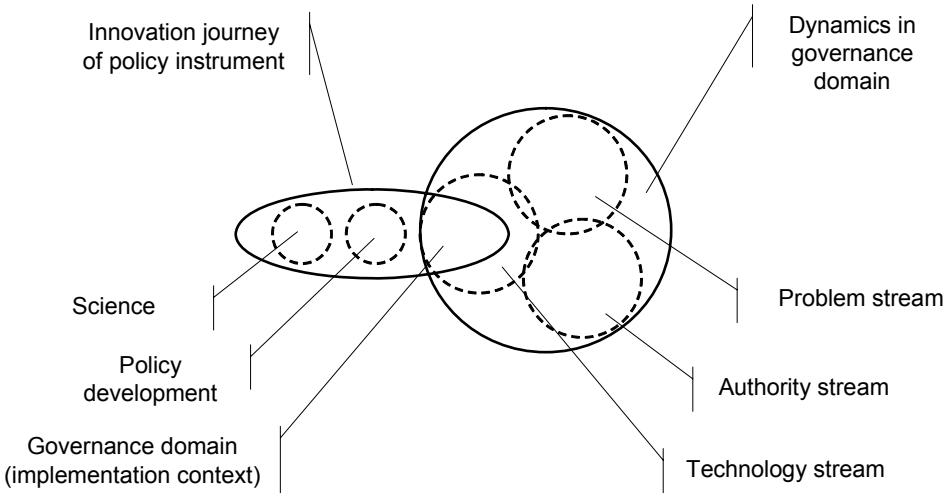

Figure 5 *The innovation journey of policy instruments embedded in a multiple stream model of governance dynamics*

From the domain perspective, on the other hand, innovation journeys of policy instruments appear as processes that take place within the technology stream. Innovation journeys can represent processes of 'coagulation' in the primeval

policy soup, to come back to Kingdon's terminology for a moment. In other words, they represent specific processes of structuration in ongoing processes of developing 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. The combined concept of innovation journey and multiple streams is schematically depicted in Figure 5.

One way to use the adapted multiple-stream model is to consider various combinations of streams, say with 'authority' leading 'problem', or vice versa, which will show different dynamics. In this way, I can construct ideal-typical innovation patterns of policy instruments based on the specific forms of how design and dynamics interact. This is what the next section is about.

4.6 Innovation patterns

At the beginning of this chapter, there was a question about appropriate conceptual tools with which to study the development of policy instruments and set up of a research design for empirical studies. I adapted the innovation journey concept by positioning policy instruments as societal technologies and embedded this concept in wider dynamics by linking it up with an adapted version of a multiple stream model of the policy process. This provides a conceptual framework which allows me to construct hypothetical innovation patterns (cf. van de Poel, 1998: 57-66) and see if they can be matched with empirical cases of policy instrument development.

For the construction of two ideal-typical innovation patterns, I concentrate on the relation between dynamics of the innovation journey of a policy instrument, on the one hand, and dynamics of the governance context in which this journey is embedded, on the other hand. As has been mentioned with relation to the innovation journey as with respect to the interaction between streams in policy dynamics, this relation is understood as co-evolution, i.e. two processes with independent dynamics that form part of each other's selection environment.[38] Generally the relation is one of mutual influence. But this influence

[38] It is possible to specify different forms of co-evolution between policy instruments and governance dynamics represented by the other two streams of problems and politics. The streams are not completely independent. Co-evolution is not blind, but actors within each stream anticipate what the dynamics of other streams will bring in terms of windows of opportunity and seek to create fit. For example, actors who are interested in bringing a certain problem to the attention of the policy makers will have a look at dynamics of political power struggle to identify cleavages, sizzling revolts, upcoming stars, etc. with a view to frame the problem so that it becomes interesting for political actors to take it up, perhaps because it allows them to delegitimise parties in power and provides an umbrella to coalesce with other opposition

need not be symmetric. I present two ideal-typical innovation patterns. One in which the innovation journey of a policy instrument dominates governance dynamics; and another one in which governance dynamics dominate the innovation journey of a policy instrument.

For elaboration of these two ideal-typical patterns, I refer to two kinds of dynamics. Firstly, the gradual stabilisation of a design in course of an innovation journey and its embedding in governance contexts. Secondly, the ongoing dynamics of the policy process characterised by interaction of problems, authority and technology. The unfolding of an innovation journey can be understood as a structuration process within the policy stream. This process has implications for the interaction of the technology stream with problems and authority. The more mature a policy instrument (i.e. the further it has come in the ideal-typical phases model of the innovation journey), the more resistant and even proactive it can be in interaction with other streams and the more it can dominate the interaction. The weaker a policy instrument (i.e. less stabilised design in early phases of the innovation journey), the more the development of the instrument is influenced by dynamics within the problems and authority stream. In this latter case, broader governance dynamics shape the innovation journey of a policy instrument.

For a bold distinction (and in reference to the notions of technology push and demandpull from the study of technological innovation), I refer to the first case of an innovation journey dominating governance dynamics as ‘design push’ and to the second case of governance dynamics dominating the innovation journey of a policy instrument as ‘dynamics pull’. Design push presupposes a fully fledged innovation journey and a strong technological regime whose own dynamics induce and shape more general policy dynamics. Policy instruments can then impact upon problem formation (e.g. regime actors engaging in problem discourse to make a case for the solution they have to offer) and/or on struggle for authority (e.g. regime actors give support to political actors who take up the policy instrument in their programme). Dynamics pull, on the other hand, can be described as an innovation pattern in which interactions between

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parties. Problem producers will also have a look at what policy options are available to offer convincing solutions to the problem. Otherwise they would risk the problem to be ignored. If necessary, they would also seek to reframe the problem to fit available solutions (Prittwitz, 1993). The same holds for dynamics in the policy stream. Policy developers anticipate the fit of their solutions with upcoming problems and political constellations. What is more, there is not only anticipation, but also anticipatory interaction across the streams. Actors from one stream strategically try to influence developments in other streams in order to shape the context so that their products meet demand and fit in easily.

the problem and authority stream produce a strong political agenda to which the communities of policy experts adapt by searching for solutions along the lines of requirements emerging from broader dynamics. In such a case the stability of designs, at least in the early phases of a so induced innovation journey, is precarious, because it depends on the persistence of the political agenda that protects it and mobilised resources for its development.

5 Empirical studies: methodology and selection of cases

5.1 Research questions

This chapter provides a bridge from the conceptual part of the thesis to the empirical study of policy instruments as innovation journeys in governance.

I set out to explore the paradox of policy instruments in case studies. With this I seek to capture some of the dynamics and complexity that have been conceptualised on the basis of governance and policy instruments literature in the preceding chapters.

I have brought forth several conceptual developments in the preceding chapters. Here is a brief summary of the key theoretical propositions:

1. Policy instruments have a double life as designs and working configurations. Innovation in governance is a result of the interaction between the two.
2. Policy instruments take shape in extended innovation journeys which describe the gradual emergence of a trajectory from the interaction of model work and configurations in context.
3. Innovation journeys unfold as critical transitions are passed from new options to first developments in protected spaces, to the embedding of a prototype, to branching out to other domains, to the formation of a global 'technological regime'.
4. Innovation journeys interact with broader dynamics in governance contexts that result from interaction of problems, authority and technology – which leads into coupled dynamics (co-evolution).
5. Co-evolution of policy instruments (as designs on governance) and dynamic governance contexts can be dominated by one or the other (cf. patterns of design push and dynamics pull). The more mature policy instruments are (i.e. further developed innovation journey), the more force they gain in interaction with governance dynamics.

In order to provide a clear focus for the empirical study, I specify two research questions that shall guide the selection and investigation of cases. For this, I come back to the basic interest in the relation of design and dynamics. I started with an association of policy instruments with design and broader governance change with dynamics. By now, there are at least two relations elaborated in which design and dynamics relate to each other. And one of them is nested within the other (see Figure 6). The double-life of policy instruments reveals a

design-dynamics relation (model-configuration) as constituent to policy instruments as designs on governance.

The first research question refers to the relation between model and configuration in the development of policy instruments:

❶ *In what specific ways do models of governance interact with actual configurations in context and bring about a coupled trajectory (as an innovation journey of a policy instrument)?*

The second research question refers to the relation between policy instrument and governance context:

❷ *How do policy instruments (along their innovation journey) interact with broader dynamics of governance and what does this imply for the role of policy instruments in governance change?*

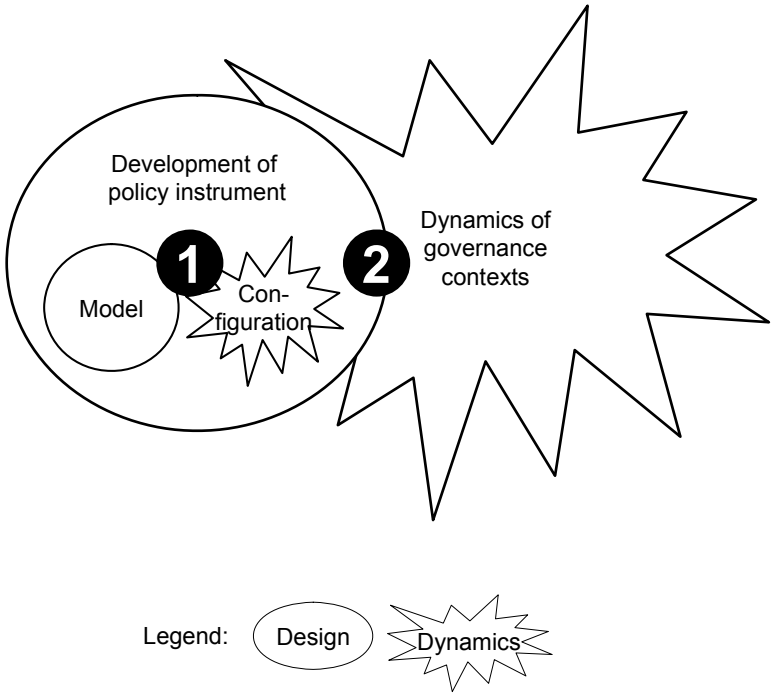

Figure 6 *Nested relations of design and dynamics in policy instruments and governance*

There is also a third issue that can be added as an open question about various mechanisms and process patterns that are at play along the innovation journey

of policy instruments and work to give it a particular shape. Discovery of mechanisms and dynamics that are not already covered in the conceptual framework will allow for a better understanding of governance change. The possibility of making such discoveries and tracing new routes as they emerge is another important advantage of the thick description that is doable in two case studies.

Finally, I mention a last point that shall be in the back of the head when I carry out case studies. It is a general concern for the 'practical implications' of what I find out about policy instruments and their development. What does all this tell us about the possibility of shaping societal development and the adequacy of particular strategies to attempt this? Given the route that is already taken, such strategies are likely to be of a second order. They will not be concerned with the effectiveness of policy in producing better outcomes, but will be concerned with the shaping of policy itself, in particular the development of policy instruments in a way so that the illusion of control that they produce remains productive. This is an issue that I will revisit in the epilogue.

5.2 Methodology

In order to answer the research questions, I carry out two case studies. Results of the studies will be analytically generalisable (Yin, 2002/1989) as they replicate what I have developed theoretically, i.e. if they can be matched with the mechanisms and innovation patterns developed on the basis of the conceptual framework of the double-life of policy instruments and innovation journeys in governance.

A case study approach is chosen to acknowledge the complexity of interaction and centrality of interpretation which is at the heart of the development of policy instruments as an object of study. I aim to understand the development of policy instruments with the help of mechanisms identified in the conceptual framework and additional ones that I might encounter in carrying out my research and which I can fit into the framework.

While mechanisms will not be able to deliver predictions due to their contingent embedding, they provide "shortish causal claims" for retrospective analysis of linkages in a sequence of events (Braithwaite, Drahos, 2000: 15). As such they refer to "recurrent processes generating a specific kind of outcome or event" (Mayntz 2003: 1) which represent generalisable elements of knowledge to explain governance change as part of a more or less complex historical narrative and which can help actors to anticipate possible developments and effects of their actions.

Empirical research shall serve to refine and direct further elaboration of the conceptual understanding rather than validate or confute specific claims or predictions. The theory of policy instruments that could be facilitated by the concept of designs on governance is of a kind that will not allow for law-like predictions anyway. It transcends "general linear" models of policy-making and aims to capture "deep embeddedness" of policy processes in historical contexts (cf. Howlett, Rayner 2006: 14).

I select two case studies that should have a certain degree of similarity for comparability, and some difference in order to allow for insights from cross-checking and broader variety of patterns and mechanisms. The first relates to the recognisable presence of something like an innovation journey of a policy instrument as conceptualised here. The second shall be accomplished by choosing one case that matches a 'design push' pattern and another one matching a 'dynamics pull' pattern as outlined in Chapter 4.

The next questions are how to delimit the cases and at what level the policy instruments should be located. The former is addressed with the help of the phenomenon of the innovation journey. Some sort of innovation journey should, as already mentioned, be visible, i.e. the instrument should have had some success in becoming articulated and consolidated as a general model of governance and started to circulate beyond the domain where the first exemplar was developed. This does imply that the early phases, where it is still unclear what the instrument is (cf. Section 4.4), must be looked at carefully to make sure that "roads not taken" are not overlooked. Some retrospective bias will be unavoidable, though.

The latter has to do with the levels in designs. With reference to studies of technology, these levels can be viewed as a technical design hierarchy (Murmann, Frenken 2006). The concept tries to capture the modularity of technical design and its organisation in the form of a nested structure of elements. Each of these elements is embedded as a component in a higher level of design and is itself composed of various component modules on a lower level. This brings us back to the question of classification that has preoccupied scholars of policy instruments for quite some time. For the approach that I take towards policy instruments, the object of study needs to be identified as a specific institutional design. Very generic instrument categories like "nodality" (Hood, 1983) are academic inventions for purposes of analytical classification, but do not represent designs as they are developed and referred to in political practice. Even with a focus on practically debated designs, however, the question remains as to the level of generality or specificity at which the focus of analysis shall be placed.[39] If we want to investigate how policy instruments develop, on

[39] Take, for example, the area of environmental policy. A very general distinction that is also referred to in political practice, is between command-and-control, economic

what shall we focus? Shall we, for example, follow the development of a tax on the use of environmental resources in general or shall we focus on the development of a particular component of such a design such as indicators used to determine the level of taxation (e.g. energy consumption)?

There are different ways in which to understand the modular character of policy instruments. Lascoumes and LeGalès (2007) try to define "instruments, devices and tools" in order to differentiate such different scales. A fixed definition, however, poses problems in dealing with empirical differences in the structure of policy instruments (for example, some have more than three levels). In any case, studying design processes should reflect the hierarchical embedding by making explicit what the next level above and below of the focal design level are (Murmann, Frenken 2006: 945). For the purpose of exploring the fruitfulness of following the innovation journey of policy instruments, I shall choose a level of analysis that allows the application of the framework. For this, it is necessary that the instrument is clearly identifiable as a particular design on governance and is discussed as a policy option in the political debate.

5.3 Selection of cases

I have considered a large number of cases that are possible in accordance with the above specifications, e.g. green electricity labelling, feed-in tariffs for renewable energy, emissions trading, energy tax, negotiated agreement (covenant), social marketing campaign, network access regulation in utilities, transition management, constructive technology assessment, energy efficiency fund, regional innovation cluster, foresight exercise, stakeholder dialogue.

Here are the criteria for the selection of two cases to form a sample for empirical studies:

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instruments that are based on incentives and/or the market mechanism, and negotiated agreements. Concentrating on economic instruments, a variety of more specific instruments becomes discernible such as subsidies, taxes and tradable permits. If we concentrate on taxes we can distinguish pollution taxes (on certain outputs) or consumption taxes (for inputs such as energy). A very specific instrument within the class of energy taxes is a type of "eco-tax reform" which couples tax increases on consumption of environmental goods with tax cuts on labour. Furthermore, one can distinguish different components of energy taxes as institutional designs. These are, for example, specification of obligors and taxed activities, procedures to adjust tax levels, methods to ascertain the level of activity and amount of taxes to be paid, means of tax collection, deployment of tax income.

1) From a brief pre-study, the innovation journey of the policy instrument should be recognisable as a rough outline. This means that cases with a too complex or diffuse history would not be eligible.
2) One of the cases should match the innovation pattern outlined as 'design push', the other one the pattern of 'dynamics pull'.
3) On the basis of earlier research experiences and institutional context of research for this thesis (interdisciplinary research group on electricity transformation), case studies with relevance for electricity provision, because of superior availability of and access to materials, are recommendable.

Against the background of these considerations, the following two policy instruments are chosen for empirical investigation of the process in which they emerged and developed:

- emissions trading as a case of 'design push'
- network access regulation in the utilities as a case of 'dynamics pull'

Emissions trading is a market-based environmental policy instrument. It comprises an approach to regulate harmful emissions to the environment by distributing limited allowances which can be traded on specifically established markets. Emissions trading became established in the USA and recently came to take on a dominant role in environmental policy by having been made part of the Kyoto Protocol for global climate protection and being implemented on an EU level as a common policy instrument for all 25 Member States.

Network access regulation is a policy instrument for the competitive organisation of utility markets. It is a specific approach to handle the natural monopoly in network bound infrastructure sectors like telecoms, electricity, gas, water and railways. The basic principle is to separate network infrastructure from potentially competitive parts of the sector and establish a regulatory framework that guarantees access on equal conditions for all market participants. Network access regulation was developed in the course of the introduction of competition to utility markets. It became a key element of market liberalisation programmes of the European Commission and international development agencies like World Bank and IMF; and is now a dominant approach in utility sector regulation worldwide.

Both policy instruments count as economic instruments insofar as their operational principles are rooted in economic theories of society and their effect on social interaction is via shaping monetary transactions. From a pre-study of several instruments, it appears to be the case that economic instruments are particularly easy to identify and delineate, because of clearly articulated operational principles which provide an identity of the instrument over the course of the journey. Moreover, economic instruments show clear characteristics of

technical design with universal textbook definitions, de-contextualised modelling and simulation of effects, and strong advocacy on grounds of technical efficiency of the instruments. Other types of instruments such as constructive technology assessment or corporatist dialogue do not build on such a unified theoretical basis and show more diffuse patterns of development for which it is more difficult to identify the course of a journey. This may require further sophistication of the analytical framework and therefore seems more advisable for later case studies with the help of a more consolidated conceptualisation and analytical framework (in this case, it would then be very interesting to compare the developmental patterns of very different types of policy instruments).

Both instruments are specifications of more general principles of understanding and designing societal regulation (see Figure 7).

Basic theory	Economics	
Class of instruments	Tradable permits	Antitrust regulation
Specific instrument	Emissions trading	Network access regulation

Figure 7 Selected cases as part of broader instrument families

According to Murmann and Frenken (2006: 939), the identity of a policy instrument can be defined by referring to its operational principle: "an operational principle defines how the parts interact with one another to implement the goal of overall technology".[40] For the two case studies, the operational principle can be described as "cap, allocate, trade emission allowances" for emissions trading and "isolate networks, open for access, and regulate network monopoly" for network access regulation.

With respect to the above-mentioned embedding in a hierarchy of technical design, the instruments can both be located as shown in Figure 8.

[40] "When human beings have grasped the operational principle of a technology, they know how an artifact can act on nature in a special beneficial way. Because an operational principle essentially specifies how components need to be arranged in order to create a successful artifact, operational principles reveal the abstract logic of how an artifact works and thus provide the starting point for understanding what the essential aspects of a particular technology are (…) the operational principle of an artifact sets out the relevant dimensions of what we will later call the design space of an artifact (…) once the operational principle of an artifact has been determined, this automatically decides the key technical dimensions of an artifact and thus determines in what dimensions two artifacts can differ technically without belonging to different classes of technology." (Murmann, Frenken 2006: 939)

Embedded in…	Environmental governance	Competition policy
Focal instrument	Emissions trading	Network access regulation
Composed of…	Determination of cap, scope, addressees, allocation mechanism, borrowing/banking arrangements, verification	Vertical unbundling, regulatory institutions and procedure, method of access pricing, quality of service regulation

Figure 8 Selected cases as specific levels within a hierarchy of design

The development of both instruments is connected to a major transformation in governance during the last quarter of the 20th century, which was termed "regulatory reform". The main tenets of this transformation were a reduction of the power of the state and scope of administrative discretion in favour of a greater role for markets and more flexibility for business. Regulatory reform is discussed both as a result of structural change in the course of globalisation and complexification of society and as part of a political programme of the transformation of the welfare state rooted in the neo-liberal ideology of an all-market society. Its main elements in terms of policy practice are the "liberalisation" of sectors in which market competition had been restrained by governmental regulation or direct provision by state-owned companies and "flexibilisation" of regulatory frameworks for the protection of common interests such as health, safety, social equality, or the environment. Regulatory reform is generally discussed as a reinterpretation of policy problems and goals, mainly a higher priority for efficiency. Shifts in policy instruments are explained as a functional consequence of such a reorientation. Taking another view on these transformations by adopting an instrument perspective and taking its lifecourse as the focal process is a good opportunity to explore what additional insights can be gained, also with respect to broader dynamics of governance change such as regulatory reform and the transformation of the welfare state.

While both instruments are similar in that they are economic instruments and feature prominently on the regulatory reform agenda, there also some important differences. One is that both instruments relate to the working of markets in different ways. Network access regulation is primarily an instrument of "economic regulation", i.e. its purpose is to make markets work. In contrast to that emissions trading is an instrument of "social regulation" which is aimed at correcting markets in order to secure common goods and social benefits (Héritier 1998; Derthick, Quirk, 1985a). Interestingly, network regulation makes a market by selectively substituting the market mechanism by authorita-

tive regulation and emissions trading corrects a market by establishing a complementary market.

Another difference is with regard to the broad pattern of the innovation journey of each of the instruments. Emissions trading follows a clearly identifiable path of becoming incrementally developed into a working configuration that then expands and diffuses. Throughout the process it was discussed and modelled and appeared in textbooks as a clearly defined instrument. Its development overall seems to be a rather linear story of success, starting from the USA, via global climate policy and on to the EU and beyond. It will therefore be the first case with regard to which the innovation journey concept seems to work well and is able to reveal a strong momentum on the part of the instrument itself. The development of network access regulation, on the other hand, appears as a more complex and diffuse process that comprises several parallel strands and has no such clearly articulated design. It rather appears as a process of bricolage with phases of convergence and divergence in the designs. This second case thus figures as a contrast to the first one in terms of the developmental dynamics.

5.4 Case study protocol

For a case study protocol that guides me in gathering and structuring data on the two case studies in a systematic way and will allow for testing my conceptual propositions, I refer to four phases of innovation journeys of policy instruments (Chapter 4). The phases were derived from analogy with innovation journeys of products:

1) Gestation: emergence of new options
2) Proof-of-principle: first developments in a protected space
3) Prototype: embedding in a broader context
4) Regime formation: branching out into other domains

The empirical delineation of these phases is a question in its own right. I can therefore not approach this as a periodisation as historians would do it, interpreting whatever they have found and putting it in a sequential order. Because phases of the innovation journey relate to critical transitions for gradual stabilisation of a trajectory, I have to check in each case for indications, if and how these transitions occurred so that the journey shifted to another phase (see Chapter 4.4). I do this by tracing concrete practices, articulation of models, experiments to create working configurations, circulation of (model) configurations that are hoped to work and institutionalisation of design practices in the form of

'technological regimes'. With regard to the embedding of innovation journeys in broader governance dynamics, I pay special attention to the interaction of such processes with ongoing changes including competing designs, rising to dominance of certain problems and shifting constellations of political authority.

In addition, I will look out for evidence that can support or undermine the theoretical propositions and help answer the research questions on the interplay of design and dynamics that were quoted at the beginning of this chapter (see Section 5.1).

Taken together, the endeavour to identify and delineate phases of the innovation journey, checking theoretical propositions and working out how design and dynamics are intermingled shall orient my work to reconstruct the development of policy instruments in the two cases. In the conclusions, I shall return to these points and present findings.

5.5 Data collection

Both cases comprise highly complex processes that cover a long time in history and take place in various governance contexts that are relevant with a view to the co-evolution of instruments with contexts of implementation. The innovation journeys can, especially in later stages, comprise reconfiguration processes in various different sectors and countries that mutually influence each other and feed back into the further development of a design. Even though I limited the sample to two cases, this still entails a laborious process of gathering, selecting and sorting data. For this thesis I had to limit myself to a rather superficial presentation of the cases. The empirical studies are not intended to reveal any new facts about the instruments or contexts of their development. They shall serve the finding of answers to my research questions and test the theoretical propositions. Moreover they shall probe the conceptual framework set out in the preceding chapters and provide hints as to how to refine it. My data collection is therefore based on generally available written sources like academic literature and documents from the policy process. Since I adopt a new perspective, data from the literature is selected and ordered in a different way than I need it. It could well be worthwhile to extend the case studies with the help of more resources for in-depth study of archive material and by interviews in the future. For a cross-check of my findings, I discussed the general storyline of each case study with colleagues who have longstanding expertise in the respective issue areas. I asked them to point out important events or instances of implementation that I might have missed and if my general interpretation of dynamics of co-evolution with other ongoing processes was plausible.[41]

[41] With regard to emissions trading, I checked with Peter Zapfel (European Commission, Brussels), Martin Cames (Öko-Institut, Berlin). In respect of network access

6 Emissions trading

6.1 Introduction

This chapter presents a case study of emissions trading which makes use of the conceptualisation of policy instruments as design on governance and the innovation journey framework. The instrument addresses the problem of regulating industrial pollution by establishing "markets for pollution", i.e. allowances for emissions which can be traded between companies.

The analysis will show that the abstract model of emissions trading is an invention of economic theory, but that it is likewise rooted in innovative regulatory practices that emerged from a confrontation between advocates of environmental protection and economic growth. Over the course of its innovation journey, emissions trading stabilised and linked up with several problems, from local air pollution, across acid rain to global climate protection. The overall pattern of the journey looks like an impressive breakthrough, starting in the USA and global policy regimes, then leading on to the European Union where emissions trading for greenhouse gases became established as a common policy framework for all 25 Member States. A further expansion of the instrument is currently under way. Linked to the global diffusion of the new policy instrument is a fundamental transformation of patterns of environmental governance which were previously dominated by the legal fixing of standards for individual installations (command-and-control).

6.2 Overview

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

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regulation, I checked with Burkhard Eberlein (York University, Toronto), Mark Thatcher (LSE, London) and Dierk Bauknecht (Öko-Institut, Freiburg). I thank them for their critical comments.

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 dollar spent on emission control produces the highest possible effect for the environment (Baron, Philibert, 2005; Tietenberg, 1985; Dales, 1968).

The case study reconstructs the development of emissions trading as a new policy instrument. Figure 9 gives a brief overview of the major events and instances of implementation in the history of emissions trading. 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 as I present it comprises four phases. Delineation of phases is based on specific mechanisms of alignment and stabilisation of a trajectory as laid out in Chapter 4. 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 expectation 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.

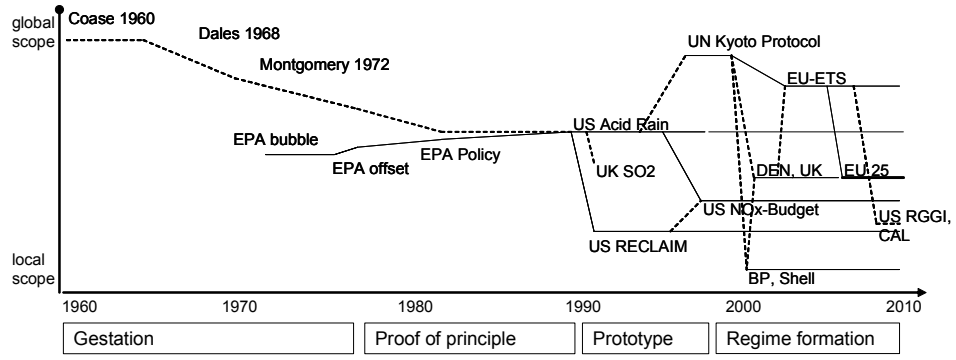

Figure 9 Outline of the innovation journey of emissions trading

A qualitative analysis of the dynamics in the innovation journey framework is presented in the following sections. I use elements from the conceptual framework when they capture patterns and dynamics which I find in the case study. In this way, I wish to provide additional insight into dynamics of governance change and the role of policy instruments as designs on governance.

6.3 Gestation: emerging practices of flexible regulation and new options in economic theory

In contemporary policy debates, emissions trading is treated as if it had always existed – an unhistorical generic form of governing the environment which happens recently to be chosen for implementation. Against this backdrop, it is fruitful to look back at when emissions trading first appears in policy debates. The reconstruction of wider developments at that time actually reveals events and processes in which the instrument took shape. Interestingly, emissions trading originated from two different strands of precursors, one in science and one in the practice of US clean air regulation. The scientific strand is the emerging concept of tradable rights to pollute. The practical strand is tinkering with flexible regulation by regulators at the US Environmental Protection Agency (EPA). These two strands brought forth new options like theories, legal rules, legitimating narratives, routines, skills, etc. that could be combined into a new type of policy instrument. First developments towards emissions trading as a new configuration in governance started in a protected space provided by legal intersti-

ces in the incumbent command-and-control regime, "regulatory reform" as a prominent item on the presidential agenda and a concentration of economics skills within one of the EPA's organisational units. The first emissions trading programme was cobbled together and grafted on existing regulation. In this manner, a proof-of-principle became established for the working of emission markets, even if actual performance of the initial configuration lagged behind expectations.

Looking back, a scientific trajectory emerged throughout the 1960s and 1970s which brought new findings in economic theory. With the conceptualisation of tradable permits as an alternative to command-and-control and taxes (Coase 1960), the establishment of emission markets became an option for controlling environmental pollution (Dales, 1968). A vigorous debate among economic theorists about the pros and cons of permits vs. charges resulted in refined articulation of the concept, its representation in economic models and assemblage of arguments for its superiority over taxes including formal theoretical proof (Montgomery 1972). In an abstract and principled form, new options for emissions regulation were invented in the course of this debate.

Environmental governance, however, was only just about to become established at that time. Regulatory practice became shaped in implementing facility-oriented emission standards from the US Clean Air Act. In 1970 the US Environmental Protection Agency (EPA) was set up and environmental regulation started to show effect, including upcoming opposition from targeted industries who put the infant regime under pressure by, for example, circulating the idiom of a "growth ban". Attempting to strike a balance between statutory provisions and interest groups, EPA officials tinkered with "flexible regulation". A first instance was the "bubble concept", developed between 1972 and 1975, which allowed the breaching of standards for one particular facility if it was compensated by emissions below the standards at another facility of the same company. The "offset mechanism" extended this concept to compensation across companies one year later; in this way, a first limited market for emission rights became established. The offset mechanism was accommodated in the legal framework of the CAA in 1977 – officially not as a policy shift, but as pragmatic repair work within the existing command-and-control regime (Cook, 1988). It did represent an interstice within the regime, however. The opening was used by young entrepreneurial economists at the EPA who "cast about for new initiatives which they could hook their stars to and use to separate themselves from the crowd" (Meidinger 1985: 462-463). They set up a development programme for market-based environmental regulation, starting from the practice of flexible regulation and linking it with the theory of tradable permits. A protected space within EPA was provided by the Office of Planning and Evaluation (later the Office of Planning and Management, OPM) as an institutional stronghold for

economic concepts in regulation. The OPM came "to serve as an organizational home for reformers in the agency" (Cook, 1988: 10).

6.4 Proof-of-principle: creating spaces for first developments at US EPA in the shadow of the old regime

Within this protected space, first developments for emissions trading as a new policy instrument took place. In 1978, the new Carter Administration was intrigued by the promise of a policy instrument that could dissolve criticism against over-boarding regulation and supported experiments with new economic techniques of regulation at the EPA (Cook, 1988: 46). This included the appointment of a market-friendly new director and deputy with responsibility for the OPM (Cook, 1988: 50). Within the laboratory that was created by the offset mechanism, the OPM and support from the White House, the emerging regulatory technique was shielded from immediate political contestation: "The political (and statutory) breathing room the Carter people needed came in the form of the growth-ban crisis and its administrative remedy, the offset policy" (Cook, 1988: 70). First developments took place in the shadow of broad public debates about political values and regulatory culture with resources in the form of economic knowledge and institutional authority provided by the OPM and broader linkages to the regulatory reform movement. "The offset policy provided a window of opportunity, albeit initially a narrowly opened one, allowing EPA reformers room to manoeuvre in exploring alternative control strategies with at least the semblance of incentive characteristics." (Cook, 1988: 46).

From an early point in time onwards, the development of market-based regulation was based on the promise of more efficient and less contentious regulation: markets would smoothly organise themselves without much political intervention and minimise the resistance of business actors to environmental protection measures. In 1977 emissions trading was no more than an abstract model of tradable permits on the one hand, and highly contextual, improvised practices of flexible regulation on the other hand. It was something which Rip and Schot in their conception of technological innovation call a "hopeful monstrosity (…): full of promise, but not able to perform very well" (2001: 162). In fact, the label emissions trading was, at the time, not yet attached to this promise. Nevertheless, the promise worked to mobilise resources. After 1978 the OPM "grafted economic incentives in an incremental and piecemeal fashion on an existing directive framework" (Marcus, 1980: 171). The result was a programme initially called "controlled regulation". In 1979 "emission reduction credits" were introduced as a currency for emission amounts below standards. Further support came from the Reagan Administration's agenda for "regulatory

relief" in 1980 (Cook, 1988: xi-xii, 1-2). In 1982 the EPA presented a proposal for an "Emissions Trading Policy Statement. General Principles for Creation, Banking, and Use of Emission Reduction Units".

Part of these early developments was an increasing articulation of promises and requirements. Tinkering gave way to more systematic and coordinated research and development. For business actors to support the scheme, it was necessary to assure liquidity of emission markets and avoid volatility of prices and related risks. This requirement shaped development efforts so that "banking" was introduced as a new design component to smooth price development. This further sophistication of the design of emission markets created promises for other actors like the finance industry who realised that trading and banking of emission certificates could be a future business field. Again, new requirements were added to assure that markets of emission certificates were compatible with the established financial market regime and its regulations and routines. The development agenda successively became more complex and more powerful in terms of the resources that were devoted to it. A promise-requirement cycle, as can be observed in processes of technological innovation, had kicked in and boosted early developments of emissions trading in the protected space within the CAA (van Lente, 1993; van Lente, Rip, 1998). Promise and requirement created momentum to overcome internal resistance to the innovation at EPA, for example by engineers and lawyers who had a central role in command-and-control regulation and feared devaluation of their competences (Cook, 1988: 4). Early developments were interpreted as a "major crusade for regulatory reform in the EPA, centred around the use of economic incentives" towards a transformation of regulatory practice according to a "culture of efficiency" (Cook, 1988: 62).

The EPA programme was, as a result of these efforts, not a generalised and transferable design, but a laboratory creation which was built in a piecemeal fashion from existing elements of discourse, legislation and regulatory skills and practices and survived within the particular political space created by offset and the OPM. Scenarios about its functioning in other governance contexts were diffuse or non-existent.

Some first checks of compatibility with public opinion and legal frameworks, however, have taken place at this early stage. Elements of the EPA's emissions trading program were repeatedly contested at the courts, mainly by environmental NGOs who found it ethically unacceptable to put pollution on sale. A key point was the legal framing of emission reduction credits. The term "property right" which was proposed by economic theorists had to be substituted by the term "allowance" in order to retain legal powers of the state vis-à-vis the holders of permits (Tietenberg 2002). Legal contestation and internal

controversy at the EPA delayed issuance of a final version of the Emissions Trading Policy Statement until December 1986.

In 1985 a first evaluation study of the EPA's emissions trading program was published. The working of the configuration was assessed against the theory of tradable permit markets (Tietenberg, 1985). This pulled the nascent policy scheme out from the shadow of the command-and-control regime and highlighted it as a first instance of a new policy instrument in practice, a proof of the principle that emission reduction obligations could be traded. From the side of business, however, the new options for flexibility did not receive much attention. Banking and trading of emission credits was only sporadically used and did not result in any considerable cost reductions (Tietenberg, 1985). Most of these deficiencies were attributed to the fact that the theoretical design principles were not yet implemented systematically.

6.5 Embedding a prototype: Project 88 and transformation of US clean air policy

A second phase, which is of major importance to the development of emissions trading, sees the configuration of the US Acid Rain Program as a prototype that is actually designed and presented as a new form of governance in its own right. This emissions trading exemplar explicitly combined economic theory with regulatory experiences from the EPA programme. It was announced as a paradigmatic shift towards market-based environmental governance, became trimmed in the rough currents of an extended legislative process and implemented as a core part of US environmental governance. The prototype induced many attempts at reproduction within and outside the USA. Several of these attempts were successful in the USA and worked to transform clean air governance from command-and-control to market based patterns. Leading up to the development and implementation of the prototype was a comprehensive process of alignment and agenda building within environmental policy networks, labelled Project 88.

Normally, a radical innovation like emissions trading would be expected to find difficulties in acceptance. This was the case in the context of the EPA programme. The instrument had been kept to its niche, officially leaving the command-and-control regime intact. The wider world of environmental governance and political discourse in general, however, was undergoing some changes during the 1980s.

The problem of acid rain moved onto the political agenda, adding to the problem of health effects from local air pollution. The environmental movement gained broad support in society. At the same time, international competition increased, financial deficits grew, and trust in government eroded. The Reagan

Administration championed regulatory reform for a business-friendly society. These parallel developments furthered social cleavages around the conceptual opposition of ecology and economy. During the 1980s, several unsuccessful legislative proposals were launched to extend the application of emission standards from new sources to existing sources. Although accompanied by flexibility and burden sharing mechanisms, industrial and regional interests in the House, Senate and the Reagan Administration blocked off any political measures against acid rain in the 1980s (Ellermann et al., 2000: 20). On a global level the commission on environment and development, chaired by Gro Harlem Brundtland, published its final report in 1987 (WCED, 1987). It took the environment-economy impasse as its starting point and proclaimed sustainable development as a vision for which diverging societal goals were to be reconciled.

It was against this background that emissions trading entered the next phase of its innovation journey. Around 1988, on the occasion of another presidential election in the USA, a broad range of political interests, notably from industry as well from the environmental movement, became enrolled in a concerted effort to feature emissions trading as a solution to reconcile environmental and economic interests and overcome the stalemate in Acid Rain Policy. In the wake of the election campaigns, a coalition of policy entrepreneurs initiated Project 88 as "a non-partisan effort to find innovative solutions to major environmental and natural resource problems" (Project 88, 1988: ix).[42] With Project 88 emissions trading left its protected space and stepped out into the wider world of environmental politics. Insiders from the development network of the policy instrument became confronted with outsiders from the societal context on which the instrument would impact. These actors needed to be enrolled for successful implementation of a prototype. In this regard, pioneering parts of the administration and other users, legal frameworks, existing policy instruments, interest groups, issues in public discourse became integrated as part of the configuration in order to make it work. Extensive consultation with key figures from industry, environmental NGOs, government and academia

[42] Project 88 was formally a study. In effect it was a focussed strategy of coalition building. Key actors behind Project 88 were two senators who sponsored the project (Timothy E. Wirth, Colorado, and John Heinz, Pennsylvania), economist Robert Stavins, Professor for Public Policy at Harvard and former official of the Environmental Defense Fund (EDF), who managed it, and a group of economic advisors around presidential candidate George H.W. Bush who promoted market-based environmental policy instruments: „EDF was a major participant in the Project 88 effort and worked closely with White House staff to develop the administration's Clean Air Act proposal (…). In particular, Environmental Defense Fund economist Daniel Dudek cooperated with key personnel at the Council of Economic Advisers and the Office of the President's Counsel." (Hahn, Stavins 1991: 24).

produced a report entitled “Harnessing Market Forces to Protect the Environment”. The report paved the way for a broad political coalition by framing environmental policy as a question of technical design, independent of contending values and political positions: “Project 88 steps away from ongoing debates over specific environmental goals, to focus instead on finding better mechanisms for achieving whatever standards are set” (Project 88, 1988: ix). The “report looks at ways to engineer the forces of the marketplace into our environmental programs, using economic incentives (and disincentives) to make the everyday economic decisions of individuals, businesses, and the government work effectively for the environment” (Project 88, 1988: 2). “Project 88 bridges this gap [between environment and economy] by applying economic incentives to the work of environmental protection” (Project 88, 1988: 9). In this way, Project 88 granted business some ownership of the instrument – indeed offering business opportunities in trading, banking and monitoring emission allowances – in order to “enlist the innovative capacity of American entrepreneurs in our environmental enterprise” (Project 88, 1988: 9).

When the new Administration moved into office it started the implementation of a prototype. Project 88 was sent into a second round so as to ensure embedding in the political context. The prototype followed the design of a cap-and-trade system which represented the state of the art in economic theory. The proposed cap corresponded with the total sulphur dioxide emissions that would result, if emission standards from the 1970 CAA would be extended to all existing installations. With the help of emissions trading, Bush could thus meet a long standing demand by the environmental movement. Looking back in 1991, when introducing proposals to include emissions trading into the Clean Air Act, President Bush said: "Let me commend Project 88 and groups like the Environmental Defense Fund for bringing creative solutions to long-standing problems, for not only breaking the mold, but helping to build a new one." (Project 88 - Round II, 1991: 2). Final rules for emissions trading were adopted in January 1993. By 1994 a market had developed.

The other side of successfully stepping out into the wider world is that the messiness of reality breaks into the design. Whereas the first emissions trading program at the EPA was deliberately built upon the institutional foundations of the command-and-control regime and only incrementally introduced trading as a flexibility measure, the US Clean Air Act was meant to be an example of emissions trading as discussed in economic theory. The transferral of the instrument from economics textbooks to political reality, however, brought several problems to the fore: In economic theory distributive effects were neglected, because in the world of market models they do not have an impact on the overall efficiency of the instrument. In the policy process, they came to the fore and fed conflicts about alternative forms of allocating emissions reduction

allowances and various other details of design (Ellermann et al., 2000: 27). The proposal by the administration also raised concern with respect to the feasibility and ethical acceptability of emissions trading – this time in larger circles than the few experts that had followed the development of the EPA mechanisms. In a complex constellation of involved parties with diverging interests and under high time pressure, the neat theoretical concept of emissions trading had to be broken up and additional elements be introduced to repair it. For example, generous bonus allowance had been introduced for political reasons for flue-gas desulphurization (scrubbers) instead of abandoning high-sulphur coal from eastern states, in addition to provisions for aiding displaced workers in high-sulphur coal mining states. At the same time, however, such compromises and ad-hoc developments had to be rationalised in real-time in order to defend the project on the ground of the promise of efficiency in order to stabilise support for ongoing development work and secure acceptance by target groups and the wider public. In effect, as one of the later evaluators of the instrument has formulated it, ”Title IV is built on more or less arbitrary emission limits, trading to reduce costs, and an allowance-allocation scheme that is at lest as messy as most tax legislation and that has a history with no more nobility” (Ellermann et al., 2000: 316-317).

Throughout the 1990s, emissions trading became widespread and accepted as an environmental policy instrument in the United States. Several emissions trading schemes became established on a regional level in the United States and the concept of market-based regulation gained dominance. In 1994, the EPA required states to establish market based systems of regulation in order to achieve national air quality standards. A prominent example is the Regional Clean Air Incentives Market (RECLAIM) for the regulation of NOx and SO_2 in the Los Angeles area (Harrison, 1999). RECLAIM was developed in parallel with the US Acid Rain program from 1990 to 1993. It went into operation in 1994. Other examples which gained some international visibility are the NOx Budget program, which was set up in 1999 and comprises nine states in the Northeast of the United States, and the Illinois VOC trading scheme, established in 1999 for the Chicago area.

At the same time, there was continued resistance internationally and especially in Europe. While the prototype also induced some activity in exploration and development of emissions trading for regulating air pollution in Europe (e.g. a proposal for SO_2 emission regulation in the United Kingdom (Sorrell, 1999) and a proposal by the business community in Norway (Hoibye, 1999)), regulatory culture, institutions and balance of interest groups provided a less favourable selection environment in Europe. The proposals therefore failed to gain support in the legislative process. Scepticism about the promises of market models was deeply anchored. Such were ethical and political concerns about

shifting responsibility for emission reduction away from polluters. Command-and-control based regimes of environmental regulation were stronger in many European countries than in the USA, with incumbent interests and institutional inertia making radical innovation more difficult (Woerdman, 2002; Cass 2005).

Six years after it started, the US Acid Rain Program was evaluated as a great success with respect to economic as well as ecological goals. One commentator emphasised that "(t)he explanation must lie in departures from the textbook world of perfect rationality, perfect competition, and perfect certainty, in which the system always follows the long-run equilibrium path – that is, in mistakes, market imperfections, and forecasting errors" (Ellermann et al., 2000: 299). Unintended effects helped to boost the instrument: It turned out that low-sulphur coal was much more widely available than forecasted, because of a considerable drop in rail transport rates due to the liberalisation of railroads and in the 1980s. This meant that low sulphur coal became widely available as an alternative to the installation scrubbers (Ellermann et al., 2000: 104-105). Whether these additional factors were recognised or not, the prototype was recommended for large scale application: "We believe that our analysis of the U.S. Acid Rain Program supports a number of general lessons… The experience … clearly establishes that large-scale tradable permits programs can work more or less as textbooks describe…" (Ellermann et al., 2000: 315).

With the US Acid Rain Program as a working exemplar in place, however, "the concept of harnessing market forces to protect the environment has gone from being politically anathema to politically correct." (Stavins 2002: 1). At least in US environmental policy, "market-based instruments have moved centre stage, and policy debates look very different from the time when these ideas were characterized as "licenses to pollute" or dismissed as completely impractical" (Stavins 2002: 14).

6.6 Regime formation: Linkage with international climate policy, EU emissions trading, and the carbon industry

The innovation journey of emissions trading did not come to an end by becoming established in the domain of US environmental governance. It branched out into other domains, found interstices in which to gain ground and flourish. Emissions trading became linked to the nascent governance framework of international climate policy. When it met resistance on this level, it shot further branches into governance domains at the level of transnational corporations. The oil companies BP and Shell became loci for the implementation of first examples of greenhouse gas emissions trading schemes. The transnational scope of these corporate schemes provided bridgeheads for the policy instrument to travel across the world and link up with European policy networks. The instru-

ment gained support from the OECD and business corporations worldwide. Its constituency became institutionalised, by founding a global association to promote emissions trading, amongst other things. In connection with revisions of energy market and climate policy regulations, Denmark and the UK were the first countries to start developing national emissions trading schemes for greenhouse gases. The cumulation of these developments on various governance levels created a global hype around emissions trading as the instrument of future environmental policy. It nurtured the expectation that emissions trading would come anyway and reversed scepticism and criticism in European policy circles into widespread attempts to become part of the emerging movement. Finally, the withdrawal by the US government from international climate negotiations freed the EU Commission to pursue emission trading on its own terms – after carefully reframing the instrument that it had so firmly contested on an international level. The Commission orchestrated the development of a European directive as a framework for interlinked emissions trading systems in 25 Member States. Implementation of the directive nurtured national constituencies of emissions trading and gave rise to an emerging global regime for development and operation of emissions trading. Although reconfiguring governance structures throughout Europe led into diverging trajectories in which the design became adapted and repaired to fit existing political circumstances in national domains, the global regime around the instrument, together with the authority of the EU Commission, can be observed to effectively work to establish design standards. Currently, it seems as if the instrument, in the form of the global regime to which it gave rise, has taken on a life of its own, quite independent of ongoing problem cycles and politics within any singular governance domain.

By virtue of international climate negotiations, an opportunity opened up for emissions trading to branch out from US clean air policy into other governance domains. US diplomats with support of the international business community pressed international emissions trading into the Kyoto Protocol – against resistance of the European Union which feared that reduction commitments could be evaded by importing excess emissions rights ("hot air") from former socialist countries (Oberthür, Ott, 1999: 188-190; Damro, Luaces Méndez 2003: 76). The development of a working rule system for international emissions trading under the Kyoto Protocol finally stranded because the EU insisted on limiting trading to 50% of required emission reductions (Cass 2005; Woerdman, 2002: 350-384). This was not the only route, however, along which the innovation network branched out from US clean air policy. When international negotiations reached stalemate, the EDF set up an initiative to encourage business corporations to move ahead with company internal trading schemes for carbon emission allowances as a means to demonstrate their support for the instrument and show that it is feasible for the application to greenhouse gases. Indeed, in

1998 BP announced the introduction of such a scheme. Shell followed soon after (Zapfel, Vainio 2002: 8). The BP and Shell schemes attracted attention as the first applications of emissions trading to greenhouse gases. These examples allowed the instrument to travel through conferences and workshops to Europe and around the world and link up with discourses of local policy and business circles (Christiansen, Wettestad 2003: 9). Towards the end of the 1990s, the OECD also picked up tradable permits and emissions trading as a pet proposal for which it could provide review and dissemination services and manifest its role as a neutral policy broker and testing agency (OECD, 1997a; OECD/IEA, 2004).

Increasingly, actors beyond established environmental policy networks also became enrolled in the innovation network. "(…) 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.[43] 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 also as a thriving service economy which started to actively advertise its products and lobby for the expansion of its market.

In the context of these ongoing developments on a supra- and sub-national level, policy initiatives started to take shape, also on a national level in Europe. In 1999 Denmark introduced the first emissions trading scheme in Europe. While this case gained little attention — as CO_2 trading was closely linked to the liberalisation of electricity and restricted to eight big companies —

[43] 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 fonds, research institutes and universities, public administration, information services and conference organisation, interest groups.

(Pedersen 2000: 3-5), a parallel initiative stirred up debate in policy cycles around Europe. In the UK, business actors set up an Emissions Trading Group (ETG) to develop a voluntary scheme as an alternative to tax proposals. The ETG comprised multinational companies who had experience in emissions trading in the USA. Central actors from the US emission trading innovation network participated regularly in working group sessions (Smith 2004: 83-84). As a result of the ETG, a European bridgehead of the emissions trading innovation network became established. The benefit for the UK of a head start on global carbon markets was a key argument in advertising the initiative to government and societal stakeholders. In 2002 the UK government endorsed and financially supported a pilot scheme developed by the ETG 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).

Due to such investments and activities, the expectation of something new and big coming up in environmental policy was rising. A global hype started around emissions trading as the policy instrument of the future. There was "a conference on emissions trading somewhere in the world every day, each accompanied by a raft of papers from universities, think tanks, and government agencies. In less than a decade, emissions trading has gone from being a pariah among policymakers to being a star – everybody's favourite way to deal with pollution problems" (Ellermann et al., 2000: 4). Europe was still rejecting emissions trading under the Kyoto Protocol, but European policy development networks were part of the hype. It was increasingly believed that emissions trading would come about anyway and that the only sensible thing to do is to get involved — and the more it was believed in, the more likely it became that it would happen. This made it difficult to be against emissions trading. Around 2000 a reversal happened in Europe. Academics, analysts, consultants, environmental interest groups and others who were critical of emissions trading turned into supporters; the debate shifted from the question of "if" to "how" (Zapfel, Vainio 2002: 9-10). The hype enrolled important centres of policy development in Europe to the emissions trading innovation network. US experts frequently travelled to Europe for lecturing and consulting purposes. Reports, technical terms, design principles, metaphors, etc. started to circulate across the Atlantic (Zapfel, Vainio 2002: 7-8).

The European Commission became a hub of informal consultations and exploration of emissions trading as a policy instrument for domestic climate

policy. The Commission hired US experts and started to take on the role of a policy entrepreneur for emissions trading within the European Union while keeping up resistance against international emissions trading under the Kyoto Protocol (Wettestad 2005a: 16). Cass (2005) explains this divergence by "norm-entrapment" on the part of the EU, resulting from earlier strategies of delegitimising emissions trading as an attempt of the USA to water down emission reduction commitments. Thus, even when large parts of European policy networks had already become supporters of the instrument, the EU was trapped by the normative objections against the instrument that it had raised earlier. In 2000, however, the Commission tabled a Green Paper with a proposal for a European Emissions Trading Scheme (EU ETS) and set up a stakeholder forum to develop it. "Astonishingly, the group – bringing together diverse interests with about 30 representatives from some Member States, industry, and environmental pressure groups – achieved a high degree of consensus and failed only to adopt a consensual recommendation in very few issues" (Zapfel, Vainio 2002: 11). When the USA withdrew from the Kyoto Protocol in 2001, the next critical juncture arose. The EU was urged to take over the lead in climate policy and demonstrate concrete successes in order to keep the international process alive (Wettestad 2005a: 16). Emissions trading was freed of the delegitimising association with US attempts to undermine reduction commitments. Substantial effort, however, had to be invested to reframe emissions trading: from a strategic device to water down binding emission reduction commitments in the hands of the USA, to an effective and efficient instrument for the European Union. The main argument was that the problem of "hot air" (excess emission rights for former socialist countries due to deindustrialisation) did not apply to an EU-wide trading scheme. Another important factor made a particularly good fit of emissions trading with the domain of European climate policy at that time: While the Commission had worked towards an unanimity vote of the Council on a proposal for a European energy tax for years without success, emissions trading (as a non-fiscal measure) was allowed to move ahead on the basis of a majority vote only (Christiansen, Wettestad 2003: 6-7). On top of that, the Commission, supported by an increasing number of European business actors, had an interest in avoiding uncoordinated development of national emissions trading systems which would prove incompatible with each other and impinge on the project of creating an internal market.

In 2001 the Commission tabled a draft Directive to establish the EU ETS. The proposal acknowledged the diversity of political and technical circumstances on the level of member states by providing a mere framework to be filled by National Allocation Plans (NAP) which should specify concrete designs. The framework contained a common infrastructure for European emission markets, including the "Community Independent Transaction Log" (CITL)

for registering and tracking allowances and it provided standards to ensure compatibility of the national systems with one another and with European policies such as the 1996 Integrated Pollution Prevention and Control (IPPC) Directive and the liberalisation of energy markets. In an "ultra-quick process", the Directive became adopted in 2003 for the EU ETS to commence in 2005 (Wettestad 2005a).

With the requirement of 25 Member States of the EU to adopt an NAP and develop their own domestic application of the EU ETS framework, the innovation network immensely broadened. Local expert communities and service economies formed within national environmental policy networks in Europe and gave the emissions trading configuration, and the "carbon industry" as it had developed in the centres of European policy-making, a firm grounding in national environmental governance regimes.

In the course of domesticating emissions trading within national policy contexts, a tension became apparent between the need of standardised design for compatibility of emission markets and particular social, technical, environmental and - above all -political conditions in the respective settings of implementation. Powerful political interests, policy legacies, legal frameworks, specific industry structure required repair work and partial re-innovation to arrive at configurations that could work, embedded in peculiar contexts of use.[44] Ongoing conflicts between the European Commission and Member States about the acceptability of various special shapes give ample evidence of these difficulties, but also show that approval of NAPs by the Commission - as one of the elements of the EU ETS framework design - establishes an effective mechanism for the standardisation of policy instruments.

From 2005 onwards, the EU ETS established a European market of allowances for 2.2 billion tons of carbon emissions from 11,500 installations. In 2006 the daily transaction volume in emission allowances reached 60 million Euro. Linked to this was a fundamental transformation of basic structures of environmental governance. Tradable permits and certificates of all kinds have become

[44] Some complexification resulted from this, which partly undermined the very principle of emission trading. In Germany, for example, allowances were to be distributed on the basis of historical emissions. In order to avoid discrimination of new market entrants, however, a special rule system has to be introduced for the equipment of new installations with emission allowances, and another for the transfer of allowances in the case of a substitution of an old installation with a new one. Here, it was necessary to introduce specified benchmarks for different technologies and a guarantee of allowed emissions for 14 years in order to avoid resistance from big industrial players. This again requires additional provisions to rule out "shadow-plants" which are officially kept in operation in order to keep allowances that can then be sold on the market.

state of the art in environmental regulation; there is hardly any problem to which they are not applied, even in an exploratory manner. Linked to this shift is a stronger role for economic expertise as well as a reframing of the pollution problem from moral condemnation to efficient allocation. Attached to the new paradigm in policy development is a social infrastructure of specialised skills, professional careers, organisations and, in the case of emissions trading, the peculiar phenomenon of the carbon industry as a whole new service economy which prospers around emission allowances as an artificially created commodity. One can speak of a new regime that has developed around emission trading as a technology of governance. Various parts of the working configuration (such as public agencies, trading departments in companies, auditors for emissions) plus elements of the multi-level infrastructure of policy development (newly created departments in public administration, think tanks, consultancy and law firms) and the carbon industry (project developer, traders, banks, exchanges) rely upon and mutually reinforce each other. This regime holds emissions trading in place—and it creates additional momentum.

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). A letter by IETA to European Commissioner Dimas from 23 October 2006 starts "Dear Mr. Dimas, as a business organisation the International Emissions Trading Association (IETA) would like to reiterate its support of the European Emissions Trading Scheme and its market approach to achieving the environmental objective of reducing greenhouse gases. There remain a number of issues that the IETA would like to raise as the Commission go into the review process of the Phase II NAPs [second phase of national allocation plans for trading scheme in Member States] that have been submitted (…)" 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). Specifically, the IETA, for example, "is engaged in stimulating thoughtful work to answer emerging difficult questions that arise in the carbon market, undertaking in-depth research and analysis". It "continues to facilitate the design of emissions trading systems in North America" and "is actively involved in various capacity building programs (…) that bring together specialists on the various aspects of emissions trading, providing the opportunity to learn from experienced participants." (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.

Even if, over the coming years, some of the great promises of efficiency and effectiveness would become deconstructed in scientific and political debate (for example, by highlighting transaction costs and other hidden costs of regulation or focusing on the distortion of textbook designs in real world politics), there is still a good chance that the instrument will be retained, expanded and will branch out into other governance domains. There is already evidence of developments to include air traffic in the EU ETS and of establishing links between European climate policy and regional initiatives for greenhouse gas emission trading in the USA and in other countries like Japan and Canada. A vision that guides these stabilising interactions across national policy development communities is a global emission market of interlinked and mutually compatible trading systems.

6.7 Conclusions

In concluding this case study I come back to my conceptual propositions in terms of phases of the innovation journey and innovation patterns in the co-evolutionary relations of policy instruments and broader governance dynamics. Emissions trading might appear as a triumphant instrument, but there are some findings on the interrelation of design and dynamics in its development that have to be taken into account.

6.7.1 Phases

I set out to analyse the innovation journey of emissions trading in terms of a process of gradual irreversibilisation of a trajectory. In doing this I identified phases of development by looking for shifts that create a new situation.

In the overall dynamics that led to the instrument, there is a clear shift from new options in economic theory as well as in regulatory practice to a first working configuration of emissions trading at around 1977. The latter came about when a protected space opened up at EPA and resources became mobilised for the development of a new configuration. This space was opened up by the insertion of the ‘offset mechanism’ into the legal framework of local air pollution

control in the USA. Further alignments created some irreversibilisation: Resources and protection from political contestation were provided by linkages with a broader movement of 'regulatory reform', which urged the White House to demonstrate activity on the alleged 'growth ban' imposed on industry by environmental regulations that were too strict. The field was tilled by young economists who were gathered as outsiders within the EPA in the OPM. This brought about the EPA emissions trading program.

A further irreversibilisation, and thus a second shift, occurred at the end of the 1980s when acid rain had entered the policy debate as a new regional problem on a scale beyond local air pollution and aggravated political conflict between environmental and economic interest groups. Project 88 was set up to link up to this problem using legislation on emissions trading as a new policy instrument that could reconcile the opposing camps and offer a way out of the political stalemate. Networking and coalition building in the context of Project 88 worked to embed the US Acid Rain program as a prototype for a new policy instrument in US environmental governance. It became an exemplar for regional SO_2 allowance trading schemes in the USA.

When emissions trading branched out from US environmental governance to the international climate policy process and from there into European climate policy, further alignments were made and some decontextualisation occurred which together culminated in a shift into a fourth phase. This happened at the end of the 1990s and gave rise to expectations about a global market of emission rights. This nurtured a constituency of business actors, analysts and consultants who were interested in further development and expansion of the instrument, buttressing the momentum that the policy instrument was acquiring. With the coordinated implementation of emissions trading on national levels in the EU, the constituency of specialised policy developers and service providers became institutionalised as a global regime around the instrument. This regime came to be supported by the institutional authority of the European Commission and economic interests of the 'carbon industry' as a new business sector that depends on functioning emission markets. Supported by special organisations like the International Emissions Trading Association, the regime continues to expand with an orientation towards establishment of a global carbon market.

These shifts mark a sequence of four phases that coincides with the heuristic of an innovation journey consisting of four phases: gestation, proof-of-principle, prototype and regime formation. Thus, the development of emissions trading matches these conceptual propositions very well. It almost perfectly reproduces the phases of a fully-fledged innovation journey as posited in the conceptual framework.

6.7.2 Innovation pattern

The case of emissions trading was selected as matching with an innovation pattern characterised as 'design push'. The pattern implies that design acquires momentum during the innovation journey which thus dominates the co-evolution of policy instrument with broader governance dynamics.

The interactions between the (evolving) policy instrument of emissions trading and dynamics in the governance domains where implementation occurred (US local air pollution and acid rain, international and European climate policy, climate and energy policy in European Member States) vary, but all show the increasing momentum of the instrument of emissions trading. This is based on the (simulation-based) promise of efficient environmental regulation (able to reconcile environmental and economic interests), an early establishment of a proof-of-principle, and then a well-performing prototype and finally, the establishment of the carbon industry as an organised economic interest group that pushes for development and further expansion of emissions markets.

Thus, dynamics of the innovation journey of emissions trading were mostly generated from 'within'. The instrument could generate a promise supported by simulation in economic model worlds (where it 'defeated' environmental taxes as a real competitor) and it could attract and enrol relevant resources and powerful sponsors. For critical shifts, such as the transition from protected space to prototype, strategic alignments could be crafted by adherents of the instrument (Project 88) so that it gained a broader social basis and became firmly embedded in US environmental governance. A similar step 'from within' was taken with the set-up of first greenhouse gas trading schemes by global corporate actors. Another example is the UK Emissions Trading Group set up by supporters of the instrument, with the help of emissions trading experts from the US. This Emissions Trading Group developed and offered a worked-out pilot scheme to the UK government before demand by policy makers for a new instrument had been articulated.

At the global level the instrument was able to create hype for a newly emerging financial and services market that became a self-fulfilling prophecy as it bred a new species of specialised services and experts. With the last phase of the journey special organisations like the IETA emerged that actively work to influence broader governance dynamics by doing political lobbying for emissions trading with the goal to expand the instrument to global scope.

The growing irreversibilisation along the trajectory and the momentum that was acquired by the policy instrument led to the instrument dominating over broader governance dynamics. But that domination did not derive from inherent properties of the instrument, but rather from the co-construction of its momentum. The breakthrough of emissions trading depended on irreversibilisations outside its own control. Thus, it remains the outcome of the co-evolution of the

innovation journey with broader governance dynamics. For example, there was opposition from lawyers and engineers who were at the centre of command-and-control-based environmental governance regimes. And opposition by environmental groups who denounced the ethical reframing of pollution that was implied by the issuance of tradable allowances. These shaped the innovation journey by challenging the robustness of the design and requiring adaptations such as a legal redefinition of permits from 'rights' to 'allowances'. Additionally, broader changes took place in the political climate. While confrontation between the environmental movement and business interests did not disappear, there were also rapprochements from the 1990s onwards. Emissions trading was (and is) dependent on such developments at the societal landscape level. It had to bypass the established regime of command-and-control regulation in order to receive the necessary support in terms of protection and resources. It could link up with the rise of market-oriented regulatory reform as a dominant agenda on the basis of neo-liberal governance concepts. There are also contingencies, like the opening created in European climate policy by the withdrawal of US President Bush from the Kyoto Protocol, and how the 'energy tax' as a competing policy instrument got caught up in the institutions of decision making in the European Union.

Nevertheless, emissions trading has reached a state of strong irreversibility. In the mature state of development, backed by a firmly institutionalised global technological regime (including research infrastructure and manufacturing industry), the instrument is there to stay. With engagement of the IETA and other actors in general political debate the instrument even actively shapes dynamics in problem and authority streams as it strengthens the political agenda of market-based climate protection.

6.7.3 Ironies of a triumphant instrument

The case offers interesting insights into the double life of policy instruments. Some findings will be highlighted which 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 emis-

sion 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 emissions trading as it really exists. 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 is, in reality, 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 can indeed develop dynamics of their own: of models that are nourished and cherished by a global design community, and of configurations that 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 2005b) 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 the services of these specialised 'technologists'. The greater 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 who develop "helpers' interests" with regard to environmental policy goals (Prittwitz, 1990). They are not primarily motivated by the goal itself, but by the opportunity to offer expertise, skills and resources as a solution.

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 in this context. 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.

7 Network access regulation

7.1 Introduction

This chapter presents the case of a second policy instrument as design on governance. I reconstruct the emergence and development of network access regulation, a policy instrument which proposes to resolve problems that occur in the deregulation of public utilities. It comprises arrangements for the provision of network services in telecommunication, electricity, gas, water and railways.

As I will show when analysing its historical development, effective organisation of utility provision as a competitive market needs something like network access regulation in order to work. There is a strong link of the innovation journey of network access regulation with broader policies of deregulation and regulatory reform in the utilities. If we think about these processes, we now see a global transformation of governance from the "positive state" to the "regulatory state" (Seidman, Gilmour, 1986; Majone, 1996; Moran 2002). It might well be that my analysis of co-evolution will shed some light on how these transformations were brought about.

7.2 Overview

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 10). The periodisation is based on dynamics of the journey as laid out in Chapter 4. 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. I will go into quite some detail, even if it concerns governance more than policy instruments, because many of the issues retain their importance in the later phases of the innovation journey.

Precursors of network access regulation were always in place in the 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; the Chicago School played 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 as well as in other countries like Chile, the UK and New Zealand; the phase also saw problems arise concerning making competition work. These problems 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 is, as we can observe it to date, 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 breakdown 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 remained 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.

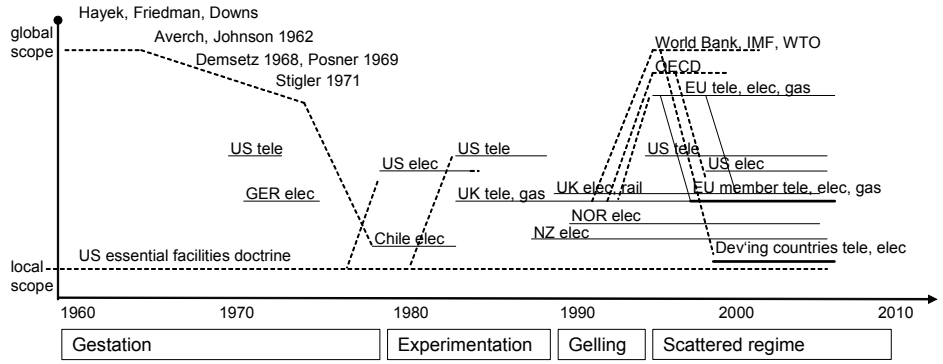

Figure 10 *Outline of the innovation journey of network access regulation*

7.3 Gestation and softening-up: niche practices and rising pressure on the public monopoly regime

A first phase in the development of network access regulation comprises developments which can in hindsight be interpreted a precursors to network access regulation. These survived in niches of the integrated monopoly regime in the utilities and were kept up as part of a repertoire from which later developments could draw. Some building blocks of network access regulation emerged in this phase. If roughly mapped in time this first phase of the innovation journey can said to be starting with the development of utility infrastructures around 1900 and extends until about 1980. Until then no network access regulation did not

exist as a policy instrument, neither as an articulated model for the governance of utilities, not as an actual configuration. The decades from 1960 to 1980, however, are of some relevance to the development of the instrument, because they saw an increase in theoretical work on alternative conceptions to the integrated monopoly model of utilities. This was linked to a surging movement for neo-liberal policy reforms, which led to policy hype for "deregulation". It softened up the regime of public regulation of utilities in the USA and spilled over to the UK where it became "privatisation". The economic perspective with efficiency and market competition as chief objectives constituted some of essential requirements for instrument development.

I also use this pre-phase to provide an outline of the historically dominating patterns of utility regulation as a context of the development of network access regulation. Looking back at the history of utility governance, the early years spanning from around 1900 to the First World War show interesting movements. In various localities, electricity, telecommunication, gas provision and railroads were organised as private companies, as public undertakings or as mixtures of both. Some utilities took over complete service provision, others were divided into branches which took over different tasks such as equipment manufacturing, service supply or installation of facilities; some provided a public service to the population of a local area; and others offered their services only to selected profitable customers. Over the first decades of the century various shifts in ownership and industry structure occurred. In connection with the First, and later the Second World War, a dominant form of utility governance emerged and stabilised. This comprised the establishment of integrated regional monopolies that were protected from competition and had a public responsibility for the provision of utility services in their franchise area. These monopolies were either directly owned and run by the state (as municipal or national enterprises) or were subject to regulation of services, investments and prices.[45] The pattern of publicly owned or regulated monopoly dominated after the Second World War throughout the world. This was based on a conceptualisation of utility provision as a monolithic whole, and an assessment that utility service was a natural monopoly, i.e. that it was socially inefficient and practically not feasible to organise utility service provision in form of competitive markets.[46]

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[45] In the USA utilities were usually privately owned and supervised by regulatory commissions and the courts. In Europe and most other countries utilities were usually owned and operated by the state. The German electricity and gas sector was an exception with a mixture of public and private ownership and regulation by public administration.

[46] This was and is different for other public utilities: road transport and canals. Here, the dominant governance structure from early on included the separation of road

Under the umbrella dominance of the integrated monopoly model, however, some special rule-settings and regulatory practices existed. They survived from the more fluid beginnings of the utilities or became developed to deal with specific problems under the dominant regime. In general, however, they were backgrounded as local or situational specificities. In hindsight, some of these niche regulations can be recognised for having preserved and developed building material for later reconfiguration processes and establishment of new forms of governance in the utilities. These niches contained concepts, procedures, codified rules and skills which could be used as elements of a locally available repertoire when solutions for new problems were sought. I briefly mention two examples to show the historical evolution of a repertoire of knowledge and practice which came to be mobilised for concrete reconfiguration projects in later parts of the network access regulation innovation journey. One example is the essential facilities doctrine in US antitrust law and the other is the negotiated associations' agreement on network access in the German electricity sector.

The essential facilities doctrine came to be formulated by the US Supreme Court in a 1912 case on railways: "The essence of that doctrine is that the owner of an input for which there is not realistic substitute (that is, a strong 'natural monopoly' in a product that is an unavoidable input in the production of another product) must make that input available to its competitors in other markets based on a reasonable price and non-price terms and conditions" (Joskow, Noll 1999: 1255). The concrete case entailed the obligation for a railroad company that owned a Mississippi railroad bridge to grant access to trains of all other companies on the same conditions as it granted access to its own trains.[47] The essential facilities became integrated and further developed in US case law (Joskow, Noll 1999: 1254-1258). Later it became imported into European law

network from production of cars and operation of services. The network infrastructure is provided by the state as a common good with open and free access. A key difference in road transport is that cars are operated individually. Some exceptions from this dominant regime, however, are visible: The commercial operation of freight transport lines (trucking), for example, was regulated until the end of the 1970s in the USA. Highways are often - and increasingly - operated on a pay-by-usage basis; sometimes they are even commercially operated by private companies. Entrance to inner city areas is also increasingly charged for, but this, at least officially, is more because of congestion problems than to the introduction of market organisation to the provision of road infrastructure.

[47] US vs. Terminal railroad Association 224 U.S. 383 (1912). The Supreme Court referred to established traditions of Common Law as even earlier elements that formed part of later governance arrangements (Beckmerhagen, 2002).

(Beckmerhagen, 2002).[48] An indication of the relevance of this early developed element in utility governance - also for later models of utility governance - is the way in which Günther Knieps, an influential designer in German utility governance, employs the essential facilities doctrine to provide the core for his model of "disaggregated regulation": "With application of the essential facilites doctrine a traditional instrument of competition and antitrust law shall be turned into a regulatory instrument with the objective to guarantee non-discriminatory network access. (…) The approach of disaggregated regulation does not anymore apply the essential facilities doctrine on a single case basis, but for a whole class of cases, i.e. monopolistic bottleneck-facilities" (Knieps, 2003: 20-21, my own translation). Reference to the codified rule complex of the essential facilities doctrine serves for legitimisation, but also for mobilising established acceptance, perceptions, routines, skills and practices for a new configuration. There were also earlier and more proximate instances in which the essential facilities doctrine was brought to bear in the development of alternatives to the governance of utility as an integrated monopoly.

Extended reference to the essential facilities doctrine was made in politically influential debates in the 1950s and 1960s between the "Chicago School" and the "Cambridge School" in the USA who fought over the question of whether public regulation of monopoly was justified by the existence of natural monopoly. In 1973 the essential facilities doctrine became a vehicle for the introduction of competition in the US electricity sector when "Otter Tail Power", a vertically integrated utility, was obliged to give access to its transmission lines for the transport of electricity between a customer and a competing supplier. I will show later how the essential facilities doctrine is reflected in the design of network access regulation as a policy instrument.

Another example for precursors of later governance models that survived within niches of the integrated monopoly regime are negotiated "associations' agreements" on network access in the German electricity sector. These agreements contain rules for the use of the electricity network infrastructure by large industrial electricity consumers that produce their own electricity in "self-generation". First in 1979 and with revisions in 1988 and 1994 three major business associations signed such an agreement to regulate how electricity networks may be used for the transport of electricity from sites of generation to

[48] In antitrust legal speech the class of competition problems is also referred to as "anticompetitive vertical foreclosure", "vertical leveraging" or "Missbrauch marktbeherrschender Stellung" (Art. 83 EG).

sites of consumption and for passing on surplus energy.[49] As with the essential facilities doctrine in the US these associations' agreements later played an important role for the implementation of network access regulation in Germany.

More examples could be discussed as instances of alternative governance configurations within the integrated monopoly regime. In the decades after the Second World War when neo-liberal critique of public regulation gained influence, exemptions from a clear-cut monopoly model became more frequent, especially in the USA. In the US telecommunications sector, the Federal Communications Commission (FCC) authorised competitors of the monopoly provider AT&T to offer a long distance telephone service for private line services, as a result of decisions from 1969 and 1971 (Derthick, Quirk, 1985a: 24, FN47). Due to the Public Utilities Regulatory Policy Act from 1978 (PURPA), the monopoly of electricity utilities was cut off from the upstream segment of electricity production. PURPA opened the market for independent power producers (IPPs) by introducing an obligation for utilities to purchase power through competitive tenders which were open to competing electricity generators.

The later examples of alternative governance arrangements to public regulation of monolithic utility burgeoned in the 1970s. This indicates that the regime had softened up and provided more space for alternatives to prosper. This softening up is a complex process in which broader landscape dynamics and strategic attacks on the existing regime intermingle.

One important landscape development was the floundering of long dominant concepts of political macro-management linked to Keynesianism and a parallel rise of neo-liberal policy ideas for market-based governance and a reduced role of the state. A more concrete sign is the build-up of deregulation as a powerful policy idea first in the USA and then also in the form of privatisation in the UK. The rise of these agendas were favoured by economic turbulence connected to the 1973 oil crisis and its consequences in the form of high inflation, stagnation, unemployment, fiscal problems and broad failure of policy approaches based on Keynesian concepts of economic macro-management. This shattered faith in the ability of governments to manage economic societal development. At the same time as the deficiencies of statist policy concepts became apparent, monetarism and free market policies more generally were gaining ground as an alternative theoretical framework. For conservative opposition parties apparent economic difficulties and policy failures presented an opportunity to attack incumbent governments with the promise of better solutions derived from another theory.

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[49] "Grundsätze über die Intensivierung der stromwirtschaftlichen Zusammenarbeit zwischen öffentlicher Elektrizitätsversorgung und industrieller Kraftwerke" signed by VDEW, VIK, BDI, 1 August 1979 (Voß, 1998).

The University of Chicago with scholars like Friedrich A. Hayek and Milton Friedman was an intellectual centre from where established theoretical foundations of Keynesian economic policy and public regulation in monopolies, more specifically, were placed under attack. Research programmes were developed and bore fruit in the form of journal articles and policy papers in which the legitimisation of public management and regulation were systematically deconstructed. A main thrust of the theoretical work was to "prove" the inefficiency of public regulation and establish linkages between deregulation and public interest (Derthick, Quirk, 1985a: 13). Targeted attacks on the theoretical foundations of publicly regulation in the utilities were a special focus, especially the concept of natural monopoly.

The theoretical work at Chicago is relevant to my interest in the innovation journey of network access regulation in two ways. For one, it questioned the legitimacy of the existing regime and created space for the development of alternatives. It is also of relevance because it produced conceptual building blocks that later became part of the network access regulation, namely the approach to differentiate between segments of utility markets as well as to restrict regulation to those parts for which natural monopoly was actually uncircumventable. Three issues in particular stand out in the publications of the Chicago School:

- They presented theoretical models that showed inefficiencies and performance deficits of regulated industries, e.g. by drawing out perverse investment incentives of regulated firms (Averch, Johnson 1962; Posner 1969).
- They questioned the existence of natural monopoly as the main theoretical justification for a renouncement of competition in the utilities. A core argument was the "contestability of markets", i.e. price control by potential rivals (Demsetz 1968).
- They challenged the assumption that regulators were acting in the public interest. For this they drew upon the economic theory of politics (Downs, 1957) and developed an argument which shows that "regulation is acquired by the industry and is designed and operated primarily for its benefit" (Stigler 1971: 3).

The academic writings essentially worked to position market competition as the natural order and put the burden of proof for the need of state intervention on the proponents of public regulation. In the USA these theoretical arguments linked up with perceived problems and political struggles.[50] According to

[50] "... deregulation developed into a fashionable idea, having its origins in academic criticism of regulation and owing its political appeal largely to the need of office-holders to address such diverse phenomena as the bankruptcy of the Penn Central railroad, the problem of severe inflation, the disaffection of the general public with

Derthick and Quirk (1985a: 35), this led to the formation of "deregulation" as a broad and powerful political agenda in the USA towards the 1980s in three stages. I will later show how this took effect in the utilities and created both space and requirements for a new policy instrument like network access regulation. For this reason, I will quote Derthick and Quirk here is some detail.

In the first stage, "[i]n the late 1950s and early 1960s, academic economists began to produce a body of literature highly critical of price, entry, and exit regulation. Now regarded as classics, some of these early studies were abstract and largely theoretical, whereas others addressed the performance of particular regulated industries und regulatory agencies and concluded with highly explicit policy recommendations" (Derthick, Quirk, 1985a: 35). These studies demonstrated agreement amongst economists "that price and entry regulation (…) is inefficient and ought to be eliminated" (Derthick, Quirk, 1985a: 36). Via "foundations and policy-oriented research institutes—that specialize in linking social science analysis to public policy formation" the theoretical concepts entered political debate (Derthick, Quirk, 1985a: 36). Apart from that "economists entered public service in large enough numbers, and in offices sufficiently influential and strategically placed" (Derthick, Quirk, 1985a: 36).

The second stage in the evolution of the deregulation agenda was linked to advocating deregulation as "a way of responding to widely shared desires, sentiments and values (…) a highly visible way to combat inflation, control the rise in consumer prices, reduce big government and bureaucracy, and restore free enterprise" (Derthick, Quirk, 1985a: 36). Deregulation came to serve as an integrating device to construct coalitions between liberal camps behind consumerism (prominently represented by Ralph Nader) and conservative camps that favoured a minimal state. Pro-competitive deregulation turned out to be a common denominator of a conservative anti-statist and pro-business agenda and a democratic concern for constraining big business, social welfare and empowerment of citizens.[51] As such it also came to be supported by US presidents (Ford, Carter, Reagan) looking for solutions which they could offer to secure electoral support: "In criticizing regulatory excess all of those presidents no doubt were guided very much by political instinct—that is, by their sense of what was on the minds of the public—but in deciding what to do about it they were heavily influenced by the advice of economists on their immediate staffs (…) And because many economists had become convinced that government regulations

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an increasingly intrusive government, and the rise of consumerism as (at least) a widespread and influential state of mind, if not actually a mass movement" (Derthick, Quirk, 1985b).

[51] "Ambiguity is a great advantage in political symbols. And here was one that in a single phrase could be made to serve in two quite different ways" (Derthick, Quirk, 1985a: 52)

were contributing importantly to inflation, imposing unjustifiable costs, and retarding growth, they had advice to offer on how regulation should be reformed. Above all, they advised giving themselves a bigger role, and all three presidents issued executive orders to that end" (Derthick, Quirk, 1985a: 30).

In a third stage, deregulation "transformed from a lonely cause with poor political prospects into a buzzword and bandwagon" (the first usage was in the New York Times in 1976) (Derthick, Quirk, 1985a: 53). In the form of "a vague and loose term" it "became a preferred style in policy choice in the nation's capital, espoused more or less automatically, even unthinkingly, by a wide range of officeholders and their critics and used by them as a guide to position taking." (Derthick, Quirk, 1985a: 35). In 1975 regulatory reform to strengthen market competition in the US was viewed as "cliché whose time has come", "new religion in town", "prevailing policy fashion" (Derthick, Quirk, 1985a: 29). For this it seemed helpful that it was an "idea (…) that responded to widely shared values, moods, and beliefs. That it could mean very different things to different people was an asset, not a liability; it suggested something worthwhile to virtually everyone. It also had very powerful and highly placed sponsors" (Derthick, Quirk, 1985a: 53).

As deregulation came to be established as a dominant problem-solution pattern in political discourse, it also had concrete effects on US utility regulation. Interestingly, this was not through legal acts that established new policy principles and demanded introduction of competition, but through adaptation of regulatory practice in regulatory commissions. In trucking and airlines regulatory decisions between 1976 and 1980 opened the sector to competition. This worked mainly through the chairmen of the commissions. "As chief executives, the commission chairmen generally expected and were expected by others to conform to type: to be active, to have an agenda or program, and to measure their success by the amount of their agenda accomplished. As of 1975-1976, it was very hard to conceive of an agenda that would not somehow respond to the gathering support for pro-competitive deregulation (…). Commission chairmen were uniformly influenced to accept pro-competitive deregulation as a policy goal and in varying degrees to promote it no matter what their prior policy convictions may have been." (Derthick, Quirk, 1985b: 207). "(H)eightened exposure to press coverage heightened their will to act and gave them additional incentives to act in pursuit of pro-competitive deregulation" (Derthick, Quirk, 1985b: 208). But also subcommittee units in Congress and federal Courts became leading critics of anticompetitive regulation. Presidents used their power to put a "a cue to chairmen and other members that these presidents favored pro-competitive deregulation and thus might be expected to reward with reappointment chairmen and members who supported that policy position." (Derthick, Quirk, 1985b: 208). This had the effect that regulatory commissions

in trucking, airlines and telecommunications in the US "undertook to change policy themselves". "Between 1975 and 1980, in advance of any legislation prescribing pro-competitive deregulation (…), they substantially and more or less simultaneously retreated from the traditional practice of public utility regulation, which entailed controls over entry and prices" (Derthick, Quirk, 1985b: 225). This, in turn, "increased pressure on Congress to take action, because Congress felt its prerogatives were being challenged. It increased pressure on Congress to act in a strongly pro-competitive way, because Congress could not easily endorse less reform that the regulatory commissions themselves chose to undertake" (Derthick, Quirk, 1985b: 211).

In conclusion, this process of softening up utility regulation from within is interpreted by Derthick and Quirk as a process of "disinterested" learning from experts on the part of the regulatory commissions: "Broadly speaking, the commissions behaved in 1975-1980 much as the original theory of them stipulated that they would. They served as vehicles for converting disinterested views of experts into public policy, although the expert views had originated, ironically, largely as criticisms of their own conduct and came to prevail inside the commissions not because the commissions were independent but because they were highly vulnerable to the appointive, monitoring, and review powers of the President, congressional critics, and judges. Once converted, the commissions proved in general to be effective vehicles for advancing the goals of pro-competitive deregulation. The vague, encompassing delegations of power that Congress had made to them gave them broad discretion to act, while the later success of administrative reformers in securing the primacy of the chairmen had endowed them with a suitable internal mechanism for concerting action. In all three cases the commissions took major, formal actions on behalf of pro-competitive deregulation before Congress did, and thereby helped spur Congress to act" (Derthick, Quirk, 1985b: 227).

Deregulation in trucking and airlines actually showed substantial efficiency gains which supported claims of overpricing and inefficiency, were extrapolated to other industries like telecommunications and electricity and put further pressure on monopoly regulation in these sectors (Vogelsang 2004: 27).

In the meanwhile, neo-liberal policy ideas could also link up with problems and politics in the United Kingdom. In 1979 the Tories won the elections in the United Kingdom with an anti-Keynesian programme. At that time, the country was in economic disarray. High unemployment, high inflation, low GDP and productivity growth followed the oil crisis of 1973-1974. UK industry lagged behind productivity levels in other countries, especially industries in the public sector (Pollitt 1999:3). "It is hardly surprising that, particularly during the 1970s when old-established political conventions, and especially the long-standing Keynesian consensus, were breaking down in British political life, many people

became to believe that, however qualified, the achievement of profitability or economic efficiency should be the main purpose of state enterprise, and that disregarding it had not only led to a substantial waste to resources but had contributed to national economic decline" (Foster, 1993: 92). For the government of Margaret Thatcher a key element of regulatory reform was privatisation of nationally-owned enterprises. An important political effect was that this would curb trade union power in the public sector. The deregulation agenda was thus turned into a privatisation and liberalisation agenda. In the first legislation between 1979 and 1983, the first concrete steps were taken by means of the privatisation of a national oil company (British Petroleum) and national ports (Amersham and Associated British Ports).

In conclusion, this first phase of the innovation journey shows how the regime of monopoly regulation became dominant after the Second World War. It also shows a softening up of this regime by means of pressure put on it by a rising deregulation agenda and specific attacks on the theoretical foundations for monopoly and public regulation in the utilities. Upon the uptake of deregulation agenda by policy analysts, the media and finally governments in the USA and the UK, these pressures took effect in the form of a turn towards pro-competitive regulation in the USA and the formulation of a far reaching privatisation policy in the UK. Pro-competitive regulation in the USA widens interstices in the monopoly regime for alternative arrangements like competition in long-distance telephone services, bidding for power supply by independent producers and mandatory transport of electricity on the basis of the essential facilities case law. As these alternative arrangements prove to be working, they increase the general claims that competition can work also in the utilities.

A key element for the weakening of the incumbent regime as well as for the development of alternative arrangements was the theoretical work by economists at Chicago. Derthick and Quirk (1985a: 34) put the paradigm shift in thinking regulation onto the centre stage of their analysis of deregulation policy in the USA: "The most significant of the regulatory reforms that took place in the late 1970s and early 1980s represented a judgement that public utility regulation had often been wrongly applied and that reliance on competition should be restored." In effect, at around 1980, public regulation became seen as captured, serving the interest of the industry more than the interest of the public (Hulsink, Wubben, 2003).

7.4 Protected spaces and learning: identification of reverse salients in experiments with deregulation in utilities

In the second phase of the innovation journey, some essential requirements for the eventual concrete instrument of network access regulation became articulated. This happened in the course of policy experiments to introduce competition to network bound utilities. Such experiments are undertaken in protected spaces created and structured by an agenda for deregulation and privatisation which was itself stabilised by a strong ideological coalition and a shared sense of the problems of integrated monopoly in the utilities. In the course of experimentation with competition in utilities, problems cropped up with incumbents using their power over network infrastructures to distort competition. Protected by the regulatory reform agenda, however, experiments were continued without much interference. In the course of this phase, from about 1979 to 1987 competition problems with simple deregulation approaches became recognised as a reverse salient for neo-liberal regulatory reform. The development of adequate governance arrangements for competition in the utilities then became a critical problem under the heading of re-regulation (Vogel, 1996). Transnational communities of government officials and policy analysts emerged which, facilitated by international organisations, began to learn across experimentation sites in different sector and country settings and to compete for best solutions.

An important starting point for this second phase are regulatory reforms as they were induced by the deregulation and privatisation policy hype in the years around 1980, especially the US trucking and airline deregulation and the privatisation of UK petroleum industry and harbours. These reforms abolished price and entry regulation, transformed public establishments into private companies and managed to let market competition do the job which before was the state's prerogative and problem. Prices went down and customer orientation went up. They were generally regarded as a success. This gave further momentum to the regulatory reform agenda and made deregulation and privatisation policy expand to other sectors. "Although the liberalization and deregulation movement for competitive industries (airlines and trucking; to some extent railroads) was different from network utilities, it affected those by setting an example and jump-starting a movement" (Vogelsang 2004: 4). The reform agenda was taken up in other countries like Chile and New Zealand and into the area of network bound utilities like telecommunications and electricity. Experiments with introducing competition were set up and carried out. The concrete approaches that were adopted differed substantially according to the sectoral and country context. In the USA, for example, competition in telecommunication was introduced by lifting entry barriers to the long-distance market. With regard to electricity, utilities were obliged to purchase power supply through competitive bidding. In UK telecommunications the publicly-owned monopolist was sold

and a second company became licensed to compete with the incumbent. In Chile the public electricity company became privatised and a separate transmission system operator was installed to allow open access to the transport infrastructure.

Characteristic for this phase is that the application of regulatory reform policies to network bound utilities led to new problems which threatened a simple continuation of the success story that begun in trucking and airlines. It appeared that the infrastructures in the utilities such as local telecommunication networks, electricity grids and gas pipelines made it considerably more difficult to have competition do the job of regulation. The main problem was that a simple market opening in terms of abolishment of entry barriers for competitors was not sufficient in order to create a working market. The incumbent industries which controlled the network infrastructure used their control in any way they could in order to protect their markets against the intrusion of competitors. Competitors, on the other hand, had to undertake risky and capital intensive investments to build up their own infrastructure (a possible answer of the incumbent to this was to offer dumping prices that drained the resources of competitors, still suffering from their investment burden, if they wanted to remain in the race); or, alternatively, accept the terms on which incumbents would allow them to use the existing network to reach the customer. The theoretical solution of the problem of market dominance with the concept of "contestable markets" as invoked by the Chicago School economists did not work out in practice.

I will give a brief outline of the general approaches followed and the experiences made in different spaces for experimentation that were opened up by a strengthened regulatory reform agenda. I limit myself to a few examples of protected spaces and learning from which some special lessons for the innovation journey can be learned. I select the case of electricity sector reforms in Chile, early US telecommunications deregulation and break-up, the first set of UK privatisations in telecommunication and gas and the reform of electricity in New Zealand. More detailed background information on these experiments regarding deregulation in the utilities is given in Appendix 1 to the thesis.

In Chile electricity sector reforms were implemented between 1978 and 1982 as part of the 'neoliberal' revolution that 'Chicago Boys' pushed through under the protection of Pinochet's military dictatorship and with support by World Bank and the IMF (Serra, 2000: 84). The design of reforms for liberalisation of utilities entailed sophisticated provisions for the use of the transmission grid. The new governance structure was based on the separation of different stages of production: power generation, transmission and distribution and it established rules for sharing the capacities of the transmission system and determining the fees to be paid this service (Serra, 2000: 94-95). Under these conditions competition between generators and free choice of suppliers for large

industrial electricity consumers was introduced and resulted in the promised drop in electricity prices and an increase in investments (Rudnick 1994: 4). Similar approaches followed in telecommunications and gas. The Chilean approach established a clear model to deal with liberalisation in utilities. A central element of liberalisation was mandatory interconnection, equal access rules for network infrastructures and establishment of a regulatory body to oversee the newly-created market (Serra, 2000: 129). In spite of these special provisions, severe problems regarding making competition work emerged in the following years. These were attributed to discriminatory practices of the incumbent utility that owned the transmission network. Leaving the terms of transmission access open to negotiation and practical limits to regulatory capacities resulted in factual barriers for competitors to enter the market (Serra, 2000: 91).

Another experimentation site in this phase of the innovation journey was the telecommunications sector in the USA. Towards the end of the 1970s, the Federal Communications Commission considerably tightened the reins on AT&T in enforcing market entry by competitors in the long-distance telecommunication business. It mandated access of competitors in the long-distance business to local distribution networks and interconnection services (Schneider, 2001: 179-194). These provisions did not prove to be effective given the information edge and discretionary power of the large integrated monopoly company. Competition remained marginal and licensed firms kept filing complaints about AT&T's anti-competitive behaviour. These attempts at extending deregulation to the telecommunications sector produced some explicit lessons about the specific character of utility sectors when it comes to competition. It was recognised that access to networks required special provisions (Derthick, Quirk, 1985a: 18). Eventually, the vertically integrated monopoly of AT&T was broken. In the course of this process, the "Bell Doctrine" was articulated. This doctrine states that "regulated monopolies have the incentive and opportunity to monopolize related markets in which their monopolized service is an input, and that the most effective solution to this problem is to 'quarantine' the regulated monopoly segment of the industry by separating its ownership and control from the ownership and control of firms that operate in potentially competitive segments of the industry" (Joskow, Noll 1999:1250). It provided another building block in the development of network access regulation in the United States, alongside with the essential facilities doctrine.

While in the context of the US telecommunications sector liberalisation and the problem of competition was dealt with in an incremental fashion by procompetitive policies of the regulatory commission and by the courts, it was the matter of broad design and systematic arrangements in the UK. Before state-owned companies were sold off, the British government commissioned studies on various design options for reconfiguring sectoral governance patterns. This

led to the concept of independent regulatory agencies and a newly designed price regulation mechanism (RPI-X). This approach established a framework for the British liberalisation experiment. It provided a basic design which was taken up in various sectors and became revised and developed according to experiences with its performance (Pollitt 1999: 10). British Telecom was privatised as a vertically integrated utility with a single licensed competitor. The regulatory agency mandated interconnection in 1985 (Holder, 2000: 54-55). In the next few years, it was recognised that a lack of competitive pressure on British Telecom and excessive demand on the regulator blocked price regulation to work as automatically as promised. Information asymmetry between regulated companies and regulators was still a problem and extra quality of service criteria had to be taken up into regulation. In the gas sector a similar approach was followed as in telecommunications. British Gas was privatised in 1986 as a vertically integrated producer, transporter and supplier of natural gas (Holder, 2000: 55). Competitors had to use the pipelines owned by British Gas (BG) while their goal was to take away BG's customers. A year after privatisation, antitrust authorities found "that BG was practising extensive discrimination, and that this was acting against the public interest by imposing high prices, deterring entry (…) BG was required to produce price schedules for all suppliers to large customers, to publish details of the terms and conditions of common carriage, and also to contract for no more than 90% of the gas from any new field." (Holder, 2000: 55-57)

A further example of experiments with liberalisation in the 1980s can be found in New Zealand. Similar to the USA and the UK, and in a slightly different way also Chile, a strong agenda for regulatory reform linked to a new government created a protected space in which experiments with new governance models could be tried out. Its constitutional mandate gave the ruling government great powers to pursue far reaching restructuring programmes. In the case of New Zealand, an emerging global design community for liberalisation in the utilities also became visible. The Chair of the Commerce Commission at the time of the reforms said regarding the roots of the reform agenda: "Official thinking was influenced by the intellectual developments internationally, including the advice emanating from international organizations such as the World Bank, the International Monetary Fund and the OECD, and by dissatisfaction with the domestic experience with activist demand management and detailed regulation of economic activity more generally" (Bollard 1997). Something like a global competition took pace for best solutions to the problem of competition in the utilities. The New Zealand approach to reconfiguring governance in electricity (1987-1990) followed the Chilean example and the "Bell Doctrine" by vertically splitting the state-owned utility and opening transmission for access by competing companies (OECD, IEA, 2001: 35). In addition to

eliminating all statutory monopoly rights and abolishing entry barriers for private companies, a second state-owned enterprise was created to compete with the incumbent. The promise was that it would allow for "light handed regulation" (Duncan, Bollard, 1992).

All these instances of experimenting with liberalisation followed different approaches and took their own specific paths in implementation and various revisions and adaptations in trying to deal with upcoming competition problems when deregulation was transferred to the utilities. The problem of competition was co-constituted by the nature of the different experiments. The strong agenda for deregulation in the US and privatisation in the UK provided protected spaces in which experiments with reconfiguring governance could be carried out even though it was unclear at the beginning how it could work. Accordingly, approaches were developed ad-hoc to make competition work. Elements of the repertoire of concepts that developed in the first phase of the journey in interstices of the regime of public regulation were mobilised. The particular shape of emerging configurations and their functionality was diverse and tightly embedded in the context of application, depending on the availability of local knowledge and political dynamics.

Regulatory reform in all these contexts was politically contested and met strong resistance by managers and by workers in the incumbent industries. Additionally, free market approaches had to go against the established view of telecommunications, electricity etc. as public services. "Commodification" met normative and functional counter-arguments. Incumbent firms did their best to resist infringements on their monopoly status. The approaches varied from US telecommunications where the essential facilities doctrine was developed into the Bell Doctrine and used to vertically break up the industry, to the UK where a strong regulatory agency with statutory powers was set up to supervise incumbent industries. The governance arrangements that emerged, apart from being case specific, were fragile and subject to many revisions. There was clearly no general solution nor a single best way in which to liberalise utilities.

Yet, these experiments did not occur completely isolated from each other. To the contrary, the regulatory reform agenda spread through transnational networks. Some of these were strategically developed as in the networks of the Chicago Boys. Another central player for network building among policy experts and "design mongering" is the OECD.[52] The net effect was that through

[52] See, for example, the OECD (1989; 1997b; 1998) and for a general evaluation of the OECD's role in preparing decisions at the level of national governments by "playing the idea game. The idea game being a question about formulating, transferring, selling, and teaching, not formal regulation, but principled or causal beliefs helping to constrain or enable certain types of social behaviour within the OECD area" (Marcussen 2001: 3).

the 1980s the regulatory reform idea gathered a worldwide constituency. In parallel, a global community of policy designers emerged where ideas were exchanged, consultation took place, the various results of implementation were observed, and common problems identified. In this community, the problem of competition in utilities was increasingly recognised as a reverse salient that was endangering the expansion of regulatory reform. Reforms now stayed short of promised efficiency gains and this threatened to delegitimise free-market solutions.

Gradually, over various stages of reform and with the inclusion of more countries and sectors, the reverse salient was transformed into a problem that to be addressed concretely. The OECD's systematic support of policy learning by setting up competition for the best solutions and by functioning as a global policy testing agency was an important factor (cf. Paasi 2005). The call for regulatory competition was taken up by governments who publicly marketed their particular concepts. In this phase of the journey, the learning was largely learning how to deregulate. An example is how the concept of vertical separation in the form of ownership unbundling that emerged from the struggle to introduce competition in US telecommunications was taken up in 1987-1989 in the case of the liberalisation of Chilean telecommunications, and in the liberalisation of electricity and telecommunications in New Zealand. Another example is the adoption of price regulation from the UK approach in 1989 revisions of telecommunications regulation in the US (for local telephone networks).

By the end of this phase, there was growing recognition that network access was a general problem for the liberalisation of utilities, and would have to be dealt with and solved if the regulatory reform agenda was to survive and spread: "the presence of monopoly upstream or downstream and dominant vertically integrated firms have caused problems in local telephony and electric utilities, where rent transfers have been substantial, relative to efficiency gains. All examples have in common that vertical relationships are paramount to successful competition in network utilities" (Vogelsang 2004: 25). The issue of vertical foreclosure was highlighted by the Bell Doctrine and the break-up of AT&T, and was taken up in the liberalisation of telecommunications in Chile and the design for liberalisation in New Zealand. The separation was not everywhere implemented as actual ownership unbundling of the industry. "Rather than relying on divestiture, other countries have generally relied instead on regulatory rules governing network access, accounting cost and internal organisational separations, new price regulation mechanisms (price caps), and antitrust policies which apply to the behaviour of dominant firms, to facilitate competition in segments where it is permitted" (Joskow, Noll 1999:1314). The key point, as Joskow and Noll (1999: 1315) argue, is not the specific divesture remedy of the Bell Doctrine, but the shift in thinking about further development of

governance designs for the utilities: "…the most enduring aspect of the Bell Doctrine is its articulation of how we think about the problems created by the institution of vertically integrated monopoly and how we go about evaluating the costs and benefits of alternative regulatory and organisational mechanisms for dealing with these problems." And they add: "… absent a nice, clean structural solution to vertical control problems, the introduction of competition into network industries is likely to beget more regulation rather than less…"

Interestingly, the isolation of network elements and problems of regulating non-discriminatory access were already part of the very first design and experiences in Chile. This very first case could actually have worked as a proof of principle for liberalisation and become established as an exemplar that would structure further design work (in a similar way as the EPA emissions trading program worked for the innovation journey of emissions trading). The Chilean case, however, was not referred to explicitly in the political debate on regulatory reform in order to make a case for the feasibility of liberalisation and present a template for governance reform in other sectors. In so far as there was discussion of design features and evaluation of experiences in the Chilean case, it was restricted to technical communities such as associations of electricity engineers (Rudnick 1994). The link of the Chilean experiment with the totalitarian regime at the time made it politically impossible to refer to it as an exemplar. While Chile was an exceptional laboratory for social engineering experiments with designs from the Chicago School (see Appendix), learning from it was blocked. This is part of dynamics, and an ironical reflection on the otherwise ideally unfolding strategies of the designers of neo-liberal governance.

7.5 Gelling and cosmopolitanisation: a policy instrument emerges from the UK multi-sector experiments

The actual emergence of network access regulation as a policy instrument from about 1988 marks the beginning of a third phase of the innovation journey. This can be summarized as follows. While policy learning had hitherto taken place with a view to solve problems of deregulating utilities, it now became focussed on developing network access regulation in its own right, as a policy instrument to complement the abolishment of statutory monopoly rights for utilities and the disbandment of price and entry regulation. The key step, prepared for in the preceding phase of deregulation experiments in the utilities, is the isolation of the network infrastructure as a separate "market" segment within the utilities sector, first conceptually, and then in concrete measures. An operational principle and a model for institutional reconfiguration emerged which comprised regulation of non-discriminatory access to vertically separated networks by pricing and control methods instituted by an independent regulator. This model

quickly became admired and imitated, and thus globally circulating as the long-sought-for solution to the problem of making competition in the utilities work. It became a way for the regulatory reform agenda to take on new momentum. Being able to deploy a universal model of network access, regulation liberalisation policies for utilities after 1990 became almost the standard, now on a global scale. An important role was played by international organisations like OECD, the World Bank and the European Commission which saw regulatory reform in one way or another as conducive to their institutional interests, and who brought in their interpretive and institutional authority to further expand liberalisation policies by diffusing what was regarded best practice in utility regulation. Network access regulation became the dominant design for utility liberalisation within the global community of regulation experts that had emerged in the preceding phase of experimenting with deregulation. Within a few years the policy instrument articulated in the UK became an informal global standard in debating on, and designing of, governance in the utility sectors.

I will tell this story in more detail, and at some length, because it sheds light on how a policy instrument can emerge and temporarily stabilise in an innovation pattern where dynamics rather than design are dominant.

The story starts with the recognition, in the course of experiments with deregulation in the utilities in the 1980s, that infrastructural networks posed a special problem for competition. It was a reverse salient for the expansion of regulatory reform. In several experiments and in global discussions of experts, this reverse salient was turned into a critical problem, the concrete issue of regulating networks. To put it briefly: The requirement of deregulation was turned into a requirement of re-regulation. Re-regulation was necessary because „An incumbent that is permitted to operate in both competitive and natural monopoly components of the industry, is likely to engage in anticompetitive behaviour such as restricting access to its network, and using its dominant position in the monopoly segment to support predatory behaviour in the competitive segments" (Nestor, Mahboobi, 2000: 37). "If regulation could be confined to the core natural monopoly network, and competition introduced for the services supplied over the network, then efficiency and innovation could be encouraged (…) The key innovation that makes a difference to performance is to introduce competition into the services supplied over the network" (Newbery, 2001: 3). This diagnosis furthered an orientation towards the infrastructural networks and the problem of assuring non-discriminatory access.

Thus, privatisation and liberalisation experiments in the UK were important, especially when a particular design emerged and stabilised that appeared to solve the problem of network access. Experience with the privatisation of British Telecom and British Gas had shown that "improving technology of regulation" was important for overall beneficial assessment of performance of priva-

tised industry (Pollitt 1999:29). It was thus made a key priority. The UK context provided a particularly amenable environment for the development of such "governance technology". Different from the USA where regulatory reform was pursued in an ad-hoc manner and incremental reconfiguration in disperse activities of regulators, courts, committees in Congress and the Presidential office, regulatory reform in the UK was set-up as a project of comprehensive reconceptualisation and reconfiguration of governance (Vogelsang 2004: 4). "British deregulation, as a consequence of the nature of privatization, was deeper and went wider. (…) as public ownership fell away, a new system for regulation of natural monopoly was established. (…) while the governments of Carter and Reagan were deregulating natural monopoly, the British Conservative government, in order to achieve the same broad ends, was establishing a new system to regulate it" (Foster, 1993: 102).

Within the UK context, a process of experiment-based learning for new regulation became to a certain extent institutionalised (March, Olsen, 1989). In the course of iterative experiments in several utility sectors a community of specialised scholars, policy analysts and administrators emerged that shared experience and common practices. Among these insiders continued debate and learning took place. Problems and requirements were articulated and alternative designs discussed and probed. This was all protected by a strong government committed to the regulatory reform idea, and which let a relatively free hand to regulatory experts.[53] Helm and Jenkinson give an account of the learning that took place: "The successful introduction of competition, it was envisaged, should reduce the need for detailed regulation. According to this blueprint, regulation would concentrate on those activities that are, for technological reasons, 'natural monopolies'. By stripping out potentially competitive activities—such as the provision of train services, electricity generation, or gas supply—and exposing them to competition, the remaining regulated activities—such as the railway track network or electricity and gas transmission and distribution—should be easier to regulate. The focus of such regulation would be to provide incentives to increase efficiency and to make sure all competitors had 'fair' access to the natural monopoly services. A significant part of this restructuring has, indeed, taken place in the UK. However, the promotion of competition has turned out to be altogether more complex than the architects of privatization imagined. Indeed, to a considerable degree, the politicians handed over the difficult issues to a new breed of high-profile regulators, notionally 'independent' from government. These individuals (with the exception of the water regulator) were given the duty to promote, secure, or otherwise enable competition (…)"(Helm, Jenkinson, 1998:xi).

[53] The solution which they accordingly developed is one that lends themselves and their expertise a strong role within the new configuration.

Over the course of the UK experiments some "gelling" occurred with respect to various options and possibilities of doing liberalisation. In the preparation of British Telecom privatisation, the model of a regulatory agency solely accountable to the economic rationale for regulation but independent of government, and at the technical side, the RPI-X method for price regulation, had been "invented" (Surrey, 1996). These were already implemented in telecommunications and gas between 1983 and 1987. In both sectors the development of competition was seen to be hampered by leaving vertically integrated utilities intact. Here also the Bell Doctrine came in as an element in the emerging global repertoire of regulation knowledge that emanated from the US experiment with telecommunications.

When it came to the privatisation and liberalisation of electricity and railroads in the third term of the Tory government in the UK, a conclusive solution to the problem of competition in utilities was presented. This design comprised vertical break-up of the industry for isolation of the natural monopoly of network infrastructure, and regulation of access conditions and prices through an independent regulatory agency whose responsibility it is to further efficiency by promoting competition in liberalised segments of the industry and substituting competitive pressure in the network segment by qualified regulatory methods. This new design was applied to electricity and railroads between 1988 and 1990: "In the United Kingdom rail and electricity privatisation (…) the natural monopoly segments of the rail infrastructure and transmission grid (…) were separately floated (…) with the regulator being given the express mandate to prevent capture of the "grid" company by upstream or downstream commercial interests" (Nestor, Mahboobi, 2000: 37). For both sectors, independent regulatory agencies became established.

The model as applied to electricity and railroads came to work as a prototype for regulation in the utilities. The two sectors provided exemplars to which further revisions of regulation in other sectors could refer and receive orientation. "Best practice" in liberalising utilities was now explicitly articulated in the regulatory sciences: 1. Identify natural monopoly bottlenecks and separate them from the rest of the industry, preferably through ownership unbundling; 2. introduce competition into all other market segments, if necessary break up large companies so that market concentration goes down, apply antitrust regulation in order to keep up competition; 3. establish an independent regulatory agency for economic regulation of natural monopoly bottleneck, apply price-cap regulation instead of rate-of-return regulation (Armstrong et al., 1994).

Within the next few years, this model was used to introduce revisions to the regulatory set-up in telecommunications and gas sectors. Following the Monopolies and Merger Commission's report of 1993 which accused British Gas of using its ownership of the distribution network to deter market entry of com-

petitors, British Gas was split up into separate companies for network operation and supply in 1996 (Holder, 2000: 55-57). In telecommunications, the model was taken up in a requirement by the regulator to introduce at least "accounting separation between British Telecom's retail business (i.e. supply of calls), network business and access (i.e. supply of lines) business. Under this new arrangement, British Telecom's network division charges all operators (including British Telecom's retail division and its competitors) for the use of its network according to a common set of charges" (Holder, 2000: 54).

Not only within the UK context the model approach had repercussions. The theoretical grounding and systematic presentation of network access regulation as it had emerged from debate among regulatory experts in Britain allowed broader applications. On the one hand, cosmopolitanisation into a universal, generally applicable design was in line with ongoing dynamics of the "regulatory sciences" as a new field of expertise that became institutionalised in connection with the British multi-sector experiment. On the other hand, there was strong demand for a tool to solve the competition problem in utilities in order to overcome a reverse salient that was holding back regulatory reform. Accordingly, the global community that had emerged in the phase of ad-hoc experiments with deregulation in utilities, represented and aligned by the OECD, was eager to take up a design that could break the impasse and carry governance reconfiguration further. In combination the local and the global dynamics turned the "British model" into a cosmopolitan "best practice", a proved design that could make competition work in utilities everywhere.

A further effect of cosmopolitanisation was the rationalisation of the developmental route towards the model. Its discovery was now attributed to ingenuity and systematic experimentation and evaluation, and the model was presented without reference to the particularities of the governance context from which it emerged (e.g. technical and geographic structure of the sectors, the UK political, legal and administrative structure, ideology of the Thatcher government). It was now a generic logic, a universal core of governance practice in the utilities. This coincided with another standardising move: the utility sectors as contexts of application were relabelled as "network industries". This allowed further decontextualisation and circulation of "network access regulation" as a policy instrument. Linked to this universally applicable tool for making competition in the utilities work was a universal promise of improved efficiency and a sense of being innovative.

This "standard model of economic regulation" (Bauknecht, Schrode, 2007; Armstrong et al., 1994; Knieps, Brunekreeft, 2003; Joskow 2006) is a highly technical model of regulation. The sole evaluative dimension that was brought to bear in the design of regulation was economic efficiency. The actual task of regulation, of fine-tuning price formulas and deciding on infringements, was

reduced to economic calculations. “This is seen as a rather technical task that can and also should be separated from the political process” (Bauknecht, Schrode, 2007). Accordingly, regulation was to be carried out by independent regulatory agencies, not accountable to elected political authority, but who were, in a sense, accountable to the ‘state-of-the-art’, as defined by experts of the new regulatory profession. In most countries, this was a break with a long tradition: “Regulation was seen as a much narrower process compared to the USA, where the independent regulator model has the longest tradition. Energy regulators in the USA have always been more concerned with balancing the interests of various stakeholders, namely the regulated companies and consumers” (Bauknecht, Schrode, 2007:10). Of course, it was even more in contrast with the idea of public service that explicitly defined a political role for the utilities to be realised by public management and regulation.

Such “technisation” had several advantages: It could promise a certain performance independent of particular, especially political and cultural, contexts, and thus guaranteed universal applicability. It served the profession of regulatory experts’ interest in being recognised as a science, and in expanding the applicability of their specific skills and resources. Finally, it contributed a further asset to international organisations that are only scantily endowed with political authority: technical legitimacy they can mobilise for applying specific criteria of evaluation and proposing “objectively better” policy. The OECD, the World Bank and the European Commission welcomed an amplification of their arsenal and did their part in pushing regulatory attention to the new standard.

Deregulation and privatisation, the guiding concepts for regulatory reform in the 1980s, were now carried by what some analysts called “new regulatory design” to be applied to network industries. “In most Western countries the regulation of utilities poses more complex problems than the regulation either of non-utility SOEs, or (generally) of private sector firms through competition policy. This is partly because utilities - particularly those in the energy sector - have intrinsic features which, by leading to small numbers of industry participants and by raising significant barriers to entry and exit, serve to attenuate competition. These features include: substantial economies of scale, sometimes to the point of natural monopoly (e.g. high voltage electricity transmission lines); economies of scope (e.g. in the provision of different telecommunication services); and large, lumpy, immobile investments in sunk assets (e.g. natural gas production facilities and distribution networks; railway networks). Further regulatory problems are raised by networks and plants (e.g. hydro-electric dams) typically having low marginal costs of expanding output up to full capacity, but high fixed costs associated with that capacity; by the potential for substantial externalities, especially environmental (e.g. coal mining, power stations); and in some cases, by inelastic demand curves (e.g. for electricity be-

cause of appliance ownership), which raise the gains from the exercise of market power. The utility problem is most acute in those industries which provide a basic service for consumers and an essential input for other firms, and where production involves the use of non-contestable or non-economically reproducible facility services owned by incumbents, to which access is required by entrants in order to compete with the same incumbent in upstream or downstream markets" (Bollard 1997).

In the following years, network access regulation indeed circulated, both through the global regulatory community leading to a convergence in the thinking of experts, and in regulatory reform approaches in various countries which were adapted to correspond to the new standard model of regulation. In Chile, network access regulation was introduced for local telephone networks in 1994 (Serra, 2000: 109-110). The government of New Zealand formulated in a policy statement from 1991: "The overall thrust of the policy, in common with that in other Western countries, is to encourage competition where markets are potentially contestable, and to focus regulation on the non-contestable markets controlled by incumbent utilities" (Bollard 1997: 4). In the US electricity sector, mandatory access to the transmission grid was introduced in 1992, open access rules and accounting separation between transmission and supply as well as encouragement for the voluntary establishment of independent network operators were issued in 1996 (OECD, IEA, 2001: 44; Vogelsang 2004: 15). Norway and Australia implemented liberalisation of their electricity sectors in 1991 and 1992 respectively.

A special role in the diffusion of network access regulation in the 1990s was played by the World Bank/IMF cluster and the European Commission. Both took up the reinforced regulatory reform agenda as a key part of their policies. The World Bank and the IMF started to require privatisation of utilities with liberalisation and network access regulation in the structural adjustment programmes that were imposed on developing countries in exchange for rescheduling of debts (Bayliss 2002). For the European Commission pursuing liberalisation with network access regulation was a way to strengthen its role vis-à-vis the Member States, justified by its contractual mission to accomplish a European Single Market (Majone, 1996). I will discuss the activities of both actors in more detail, also because this will show the co-evolution of design and governance dynamics.

For the World Bank and the IMF, a readily available technology for competition in the utilities legitimised their pressing for privatisation and admission of foreign direct investment in the context of the structural adjustment programmes.[54] The exemplar of UK liberalisation with network access regulation

[54] „The World Bank and IMF supply loans to developing country governments at concessional rates. Performance criteria on which lending decisions are based (i.e. con-

was referred to "Recent experience – initially in industrial countries but increasingly in developing countries – shows that energy supply through networks can be made competitive (…) Intensive regulation needs to be limited to residual elements of monopoly power—for example, in network distribution systems and possibly at the interface between trunk transmission networks and distributors or retailers. Much less control should be exercised over interactions between essentially competitive market players" (IBRD, 2000: 102-104).

Liberalisation connected well with the strong interest of creditors in possibilities to get their loans to developing country governments paid back from revenues of privatisation, and on the part of utility companies, with their interest in international expansion of their business field. Conceptually, privatisation was considered a solution for development problems because it frees the state of tasks which it could not handle, creates financial leeway, introduces financial capital and know-how to developing economies as well as helping to build up and expand basic infrastructures. Accordingly the "The Bank will focus on countries which demonstrate - through actions - a credible intent to privatize and liberalize. The Team's objective is to have as much of the sector as possible transferred into private ownership."[55]

This introduced a radical departure from Keynesian import-substitution models above all in Latin America, to market opening through privatisation and liberalisation programmes in the first half of the 1990s. Reforms to liberalise electricity were carried out in Argentina and Columbia in 1991, in Mexico in 1992, in Peru in 1994 (Rudnick 1994; Voß, 1997). Argentina constitutes an interesting case, as it experienced one of the earliest and most comprehensive reform programmes. In 1989 a new president, Carlos Saúl Menem, came to power and introduced neo-liberal reforms in exchange for assistance by international financial organisations in dealing with hyperinflation and debt problems. The government set up a "a reform package unmatched in the entire world", as World Bank officials recognised (Manzetti, 2000: 84). The telecommunications company was initially privatised as a monopoly without any regulation. Two years later a regulatory agency designed after the OFTEL model was put in place. Privatisation of electricity in 1991 included vertical separation and horizontal split up of state-owned generators (OECD, IEA, 2001: 33). In Africa, if

ditionalities) are set out in Letters of Intent written by recipient governments. The Letter "describes the policies that [the government] intends to implement in the context of its request for financial support from the IMF." A review of these shows that fragmentation and privatisation of electricity utilities feature in most lending programmes." (Bayliss 2007: 24)

[55] "A Brighter Future? Energy in Africa's Development The World Bank Group" cited by (Bayliss 2007)

there were reform programmes, these were induced by international organisations. “Because of a lack of consensus on and commitment to privatization, governments have been slow to take the initiative, and the World Bank and other external agencies have often initiated much of the design work” (Campbell White, Bhatia, 1998: 42).

In Europe liberalisation in the utilities occurred in various countries, and was strongly advanced by the European Commission (Schmidt, 1998; Voß, 1998; Eising, 2000). As I noted already, the European Commission used the emergence of the new design paradigm as an opportunity to open up regulatory reform in the utilities as a new policy field. In this policy field, it could play a strong role in interaction with Member State governments and the European Parliament, e.g. because of so-called “Article 90 Directives” which the Commission can decide without participation of Council and Parliament). Liberalisation, it was argued by the Commission, is ultimately a measure to break down trade barriers between national markets and thus is a key to the completion of a Single European Market. Such an argument refers to the Commission’s mandate, so there could be no doubt about its competences (Schmidt, 1998: 335-337).

The European Commission started initiatives for liberalisation in telecommunications with a Green Paper in 1987 and a Directive in 1990 (90/387/EEC). In the electricity sector, a proposal from 1992 led to a considerably weakened Directive in 1996 (96/92/EC). In the railways sector, a Directive was passed in 1991 (91/440/EEC). All these Directives established framework regulations for governance reforms in the utility sectors of all Member States. Within a few years they had to be implemented by reconfiguration of the sectoral governance patterns. The design invariably invoked the principle of separating the network infrastructure and opening it for access by competing utility actors which could then supply customers within the service area of former monopoly suppliers. The degree to which the European Commission was able to implement the standard model in its framework regulations varied among sectors. In none of the sectors was it able to prescribe the isolation of network services through ownership unbundling. All that the European Commission could achieve was the separation of accounts for network and other services (in telecommunications and railways) or the separation between administrative units for one or the other (in electricity). Especially in electricity it proved difficult to assert the best practice model of utility liberalisation as exemplified by the UK prototype. Germany and France in particular (on behalf of their national electricity industry) resisted codification of the requirement to install an independent institution for the regulation of network access. They insisted on leaving the determination of network access conditions to the free negotiation by incumbent utilities and new competitors.

Nevertheless, the result of European Union institutional politics for liberalisation in utilities enabled by the momentum generated by the emergence of network access regulation as a dominant design was that fundamental reconfiguration across different countries and sectors in Europe was induced. The design principles embodied in the model of network access regulation embedded local design work and political debate in a global framework of a densely networked and partially institutionalised expert community offering a cosmopolitan best practice.

Thus, the regulatory reform agenda and development of the policy instrument of network access regulation co-evolved. In the 1980s, regulatory reform created protected spaces for experiments from which instrument emerged. The instrument took on dynamics of its own, stabilised as cosmopolitan design, and aligned a global community of experts. As such it provided a solution to overcome a reverse salient in liberalising utilities as remedy to the agreed upon problem of inefficiency. This gave further momentum to the regulatory reform agenda and made its expansion to the utilities possible, which further pushed the instrument. Network access regulation became a global design standard in all parts of the world and in various utility sectors within a few years in the early 1990s. For the champions of the instrument, it appeared to bring about policy convergence. Further, adherence to a universal standard design enables the division of design labour between work on a cosmopolitan construct with modular components which can be locally adapted.

The various components of the universal design could now be presented together: it rests on a conceptualisation of utility sectors as markets that consist of different parts: those that show natural monopoly characteristics (mostly transport via network infrastructures) and those that are potentially competitive (all other parts such as equipment manufacturing, service generation, trading, customer supply). For sectors with such two-tier markets the concept of "network industries" became established as a generic problem to which network access regulation is applicable as a solution. Network access regulation in a fully-fledged shape of a cosmopolitan design is geared towards the requirement of non-discriminatory access to network services (as a condition for dynamic efficiency in competitive market segments) and efficiency in the provision of the network service itself. The latter comprises more traditional requirements of monopoly regulation. Its operational principle is to isolate natural monopoly services in order to avoid cross-subsidisation and incentives for discrimination and to create institutional arrangements for network regulation in which economic rationality can be brought to bear in a manner protected from political interference. The exemplar for this paradigm is the British model with ownership unbundling, independent regulatory agency and the application of dynamic price regulation devices (RPI-X).

7.6 Dynamics in a scattered regime context: divergence in implementation, opening-up of the model and loosely coupled design work

After the cosmopolitan design had emerged and diffused globally in what was to some extent a policy hype for liberalisation, it encountered the dynamics of governance in local contexts. The reconfiguration processes that were induced by the liberalisation policy turned out to follow their own paths, partly shaped by the design as carried by global policy experts, but at least as much by the specific political dynamics within the local contexts of implementation. The cosmopolitan design was powerful enough to justify breaking up of existing patterns of utility governance, but it could not control the following process as to reproduce model prescriptions from the design world in practice. What appeared as a straightforward, almost technical move in the governance of utilities brought about turbulent political dynamics and diverging configurations.

Most processes of institutional reconfiguration could not bridle the market power of incumbent network-owning utilities. In practice, therefore, competition in the utilities remained a problem. Promised efficiency gains could not be fully realised. In some cases, liberalisation experiments even produced outright system failures such as electricity blackouts and railroad accidents. Thus, disappointment started to set in. The globally blooming regulatory reform agenda started to unravel, and along with it, also the instrument. It was already damaged in local aberrations; now it also lost backing by its cosmopolitan networks. The cosmopolitan design even became criticised on home ground. With the comeback of social and environmental concerns on the political agenda, the recurring needs for adjustment and repair took greater weight and the "standard model of economic regulation" became open to revisions in the United Kingdom. Regulation became broadened to include responsibilities for social equality and environmental protection beyond the economically-defined responsibility for efficient operation of network services. The independence of regulatory agencies was reduced and some political guidance was re-established.

Thus, there are good reasons to speak of a fourth phase in the innovation journey. I will discuss selected instances of developments in utility governance in some detail, focussing on the precariousness of the design of network access regulation in implementation, the gradual re-opening of the "economic standard model of regulation", and ongoing design work in the context of a scattered regime structure, in particular the role of modularity.

The precariousness of network access regulation as a standard model of economic regulation is visible in the problems it leads to (thus, a lack of effectiveness) and to which I will return later, and in the political resistance to it. Indicative are the vicissitudes of the European Commission's first proposals for

liberalisation directives. While the Commission was guided by the "standard model of economic regulation" with a working exemplar in the UK electricity sector, it met with strong resistance from the governments of Member States.

Adaptations and dilutions occurred already in the process of crafting European Directives for utility liberalisation. The original proposal by the Commission for a Directive for electricity liberalisation focused on organisational separation of networks and regulated third party access to networks, but became substantially watered down.[56] The final Directive only prescribed accounting separation and allowed for three different alternatives in regulating network access: regulated third party access, negotiated third party access and an option called Single Buyer. Of these three only the first reflected the standard model (OECD, IEA, 2001: 38). To allow accounting separation as a soft version of unbundling went against the lessons, captured in the Bell Doctrine, which led to the vertical break-up of the US telecommunications industry.[57]

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[56] Also in telecommunications proposals for liberalisation directives by the European Commission became watered down and perforated in negotiations with Council and Parliament until a design was reached that was acceptable for the different veto-players whose consent was needed. The implementation of network access regulation in Member States also diverged from the standard model (Boylaud, Nicoletti 2001: 104-105).

[57] In 1992 the Commission proposed abolition of special and exclusive rights in order to allow market entry, compulsory, qualified TPA, advocates vertical separation and open access to networks in electricity and gas. Issue of third party access met resistance in Council (Proposal for a Council Directive concerning common rules for the internal market in electricity, OJ 1992 C65/94, and natural gas, OJ 1992 C65/13). In 1993 and 1994 softened up proposal for Directive. Now it is not compulsory access, but negotiated, and no management unbundling, but accounting (Amended Proposal for a European Parliament and Council Directive concerning common rules for the internal market in electricity, COM/93/643, COD 385 and 384). 1995 EU COM Green Paper: Single Buyer was brought in, taken up as alternative to negotiated third party access. Network of regulatory agencies on an EU level suggested that "It is clear that the free operation of the market has to be the principle instrument of any policy. The intervention of public authorities has to be restricted to ensuring that this market functions to the satisfaction of the general interest. [...] It is in the Community's interest to limit Community regulation to the absolute minimum necessary to reconcile freedom of movement with the legitimate objectives of the Member States" (Green Paper "For a European Union Energy Policy", Com (94) 659, Jan 1995, p. 33). Directive 1996 establishes network access (negotiated or regulated network access OR single buyer), accounting and administrative unbundling (Electricity Directive 96/92/EC).

The implementation of the electricity Directive reflected the fraying of design options in the European framework regulation, and in fact, went further in that direction (Midttun, 1997; Arentsen, Künneke 1996; Gilbert, Kahn, 1996; Steiner 2001: 150). Network regulation took on very different forms in practice. Some countries like Austria, Belgium, Denmark, Ireland, the Netherlands and Portugal have established transmission system operators as legally separated companies which remain under the control and ownership of the incumbent utility. Other countries like France, Germany and Greece have adopted a weaker form of separation that comprises only managerial operations. In some countries, transmission is not vertically integrated with the other electricity function. Only in Finland, Spain, Sweden and the UK networks were put under separate ownership and in Italy at least an independent operator became established (OECD, IEA, 2001: 38). With respect to network access most EU countries have chosen regulated third party access. But also here there are notable exceptions. France and Germany implemented special designs which they had pushed into the Directive as allowable options before.

The German case is of special interest, because is represents a new learning process with a customised design that builds on a local repertoire of network access regulation which survived in niches of the monopoly regime. Germany opted for negotiated third party access. Thus, it linked to its tradition of negotiated "associations agreements" between representatives of the electricity companies and industrial users. Another option was politically not feasible, because the opposing interests of incumbent utilities and large industrial companies, through their linkage with factions in parliament, effectively blocked a legal decision on the matter of network regulation. Delegation to industrial self-regulation thus appeared as the only way to move ahead and meet requirements by the European Directive for market opening (Voß, 2000; Böllhoff 2002; Eising, 1999). The same approach was applied in the gas sector where the same allowance for negotiated third party access had been made a condition by the German government in the preparation of a directive (Mez, 2003). These agreements have been revised several times, with the government always using its legal competence for direct regulation as a lever to pose specific substantial and procedural requirements that the agreements had to meet in order to avert direct state regulation. In the electricity sector, this had brought about rules that were quite acceptable to the global expert community (OECD, IEA, 2001: 41-43). In the gas sector, however, negotiated associations' agreements on network access, are regarded a failure, in spite of several revisions (BMWA, 2003). A general limitation of this approach based on industrial self-organisation is that concrete cases of network access require individual contracts between incumbents and competitors. This creates leeway for incumbents to frustrate attempts of new companies to enter the market. This is especially the case because the

new entrant can sue for access if the incumbent network owner refuses access; however, this introduces delays and uncertainties. Network access therefore remained a highly problematic issue in Germany.

Let us now move to the USA where liberalisation of the electricity sector had already occurred. There, some spectacular accidents that led to system breakdown led to reconsiderations. One such accident was the California electricity crisis. While liberalisation in the utilities was pursued on a state-by-state basis in the USA, nevertheless "the favorable British experience with electricity restructuring seemed to show a way to substantial cost and price reductions. In this situation, California was the first U.S. state to embark on an ambitious electricity sector reform. Rather than learn from the British example, however, the state legislature and public utility commission designed something completely new, using ingredients that had never been tried before and putting them together to a complicated whole" (Vogelsang 2004: 15). In 1994 California went ahead and established an 'independent system operator' to operate networks on an open access basis and an obligatory power exchange. This did not succeed, however, in bringing about competition for end-users. In late 1999 hydrogeneration went down due to a drought. This caused generation prices to peak (also because increased gas generation pushed up prices on market for NOx emissions allowances). Electricity distributors, however, still had their retail prices fixed by regulation so they lacked liquidity to buy the necessary electricity. Over the coming two years this resulted in a number of planned power outages and productivity losses to the economy (Vogelsang 2004: 16). This made global news as the "reform meltdown" due to "bad design" (Vogelsang 2004: 20-21).

"Despite the high costs of the crisis to California, the experience therefore suggests that decentralized regulation with a laboratory of the states has worked to some extent. California influenced other U.S. states to restructure but they did not follow the same model. Thus, the response to the California crisis was twofold. States with ongoing reforms strengthened those to avoid California pitfalls. Other states, with the exception of Texas, postponed or cancelled any planned electricity reforms at the state level. In addition, the FERC went in to strengthen precautions against the use of short-term monopoly power in generation and to increase interstate transmission coordination and transmission capacity" (Vogelsang 2004: 20-21).

In this way, the governance of utilities became acknowledged to be more than a technical task with a 'one size fits all' solution.[58] The practical disillu-

[58] This point holds even stronger if one considers other sectors, in particular the water sector. The UK had moved ahead with a new regulatory framework in 1989 (Holder, 2000: 59-60). In Germany water liberalisation became an issue in connection with modifications in general competition law for the liberalisation of electricity and gas.

sionment with great expectations on competitive markets for utility services provision also fed back into the expert community in which it scattered the emerging paradigm and re-opened debate and new alleys of enquiry: "Recent experiences with liberalized infrastructures, notably the Californian energy crisis, the railway accidents in the UK and the increasing concerns about the long-term security of supply in energy have made politicians and public opinion increasingly sensitive to the possibility of destructive effects over the longer term. Gradually it is being acknowledged that the shifts in governance structures, caused by liberalization and privatization, have a fundamental impact upon the evolution of network industries. (…) A new balance is sought between various institutional arrangements, including markets, public sector involvement, and private initiatives." (Groenewegen, Künneke, 2005: 1-2)

A report of the OECD (OECD, 1997b: 10) mentioned complexity and uncertainty, policy fragmentation, lack of coordination and planning capacities, vested interests, incentives inside regulatory bureaucracies, lack of responsiveness of regulation to context developments and overall regulatory inflation. Also specificities of implementation contexts became acknowledged such as ownership structure before liberalisation (OECD, IEA, 2001: 32), the strength of governments in the context of different types of political systems and sectoral structures (Levi-Faur 2002), technological conditions within the various sectors (Voß, Bauknecht, 2007).

Politics of various kinds played a role in the occurrence and continuation of what would be seen as deficiencies from the point of view of the standard model. Often integrated utilities were only obliged to establish separate accounts for their monopoly and non-monopoly activities. (An intriguing example is the US telecommunications sector in which the vertical break up which was already being pursued prior to the emergence of the standard model was reversed in the Telecommunications Act of 1996.) Even the liberalised parts of

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Water as a remaining case for a special paragraph on exemptions from the prohibition of cartels became an occasion for a vibrant political debate about liberalisation in the German water sector. Particularly the Ministry for Economics, regulatory scientists and professional policy analysts pushed the concept of network access regulation (e.g. Deutsche Bank Research, 2000). They were opposed by municipalities, labour unions, environmental organisations and the Ministry for the Environment who argued that technical conditions in the water sector debarred open access to networks as an option (cf. for example articles in Büscher, 2001; and UBA, 2000). In the end, an incremental strategy for the modernisation of management practices in the water industry was adopted. The German Ministry for the Economy stated after two years of intensive struggle with adversaries that "not all that is theoretically possible in terms of market opening is also practically and politically useful" (BMWi, 2001).

the market were often not competitive, because incumbent industries were not split up horizontally. This is often explained by the interest of governments in revenues from privatisation so that investors' interests can be met without much competitive pressure. Another factor is surging global competition and the strategy of governments to build up 'national champions' as globally strong global players. Finally, network regulation was in some cases not assigned to independent and sufficiently powerful agencies, but was left to the negotiation between market players or remained in the hands of governments which in some cases still owned the assets of the utilities. Germany is a prominent example in this respect.

A further view of the difficulties and shifts is possible by looking in detail at what happened in the UK, the cradle of the standard model. Over time several problems had arisen in the UK context. Difficulties were encountered with applying the much acclaimed RPI-X formula in practice. This mainly referred to the persisting need for the regulator to estimate costs of utilities and related information asymmetries. Another big issue was the quality of service. Especially in the railways sector, inconvenience, chaos and major accidents made headlines in the years after liberalisation. Market dynamics made that after a phase of "asset-sweating" competitive pressure for efficiency brought about cracks in the main infrastructures. This caused breakdowns in railway service and electricity (Helm, 2004b: 12). General problems of competition occurred because former monopolies had not been split up sufficiently and were now dominating the market. On top of that there were attempts of actors to reverse vertical disintegration by buying into network operating companies (Holder, 2000: 60). Over time the cost of regulation also came into view: £ 60 million per year for the budget of six regulatory agencies, plus compliance costs within the companies (Pollitt 1999:19).

These problems first led to piecemeal and stepwise adaptations on the level of components of the regulatory design. For example, quality elements were introduced in pricing formulae, regulators were entrusted with the implementation of social and environmental policy measures (OECD, 2002: 26), 'consumer watchdogs' were installed to take care of the social aspects of utility service provision, divestiture of plant capacity was required, the obligatory power exchange and single market price in electricity was abandoned, and informally, long-term planning procedures became established through the establishment of stakeholder strategy groups, for example, for coordinating investments in network infrastructure (Bauknecht, Schrode, 2007: 12). Some of these steps, ironically, were now inspired by design principles that had evolved from contexts where 'aberrations' of the British model evolved in the implementation process (OECD, IEA, 2001: 43).

Such rather technical problems required repair and continued design work. Larger development introduced further dynamics. Firstly, "The stock market bubble burst, and with it the more uncritical market enthusiasms too. Competition had in any event been much circumvented by the merger boom of the late 1990s. Telecoms consolidation had left incumbents in powerful positions, the British energy market was coalescing around five vertically integrated firms, three of which were overwhelmingly dominant in Europe too (E.ON, RWE, and EDF)" (Helm, 2004c: 10-11). Secondly, towards the end of the 1990s the heyday of neo-liberalism had passed, issues other than efficiency regained ground in defining the political agenda, namely social aspects of globalisation and climate change as representative of the larger problematic of sustainable development. Thirdly, in the USA, the UK and other countries throughout Europe conservative governments were voted out of office and parties with more socially-oriented programmes were elected. These shifts in problem attention and occupation of positions of institutional authority together with divergence and setbacks in developing appropriate policy instruments made the legitimising and protecting role of the regulatory reform agenda unravel. This fed back onto the design of network access regulation.

The effect of larger political dynamics on the development of instruments for network access regulation is visible in the British case in the form of a gradual intrusion of other than economic, namely also social and environmental values, into the space in which network regulation is developed. Goal conflicts became reintroduced into the arena by making regulators responsible for the social and environmental performance of the utilities and adding such competences to their task lists. In practice this meant that opposing goals, trade-offs and related political conflict became part of the carrying out of day-to-day regulation. Initially professional regulators made attempts to secure their autonomy which led into "struggle between neo-liberal economists at Ofgem who see environment-related objectives for Ofgem as political interference and those in government who envisage a wider role for Ofgem" (Green 2004: 27). When actors from the wider political environment were successful in injecting their concerns and adding responsibilities for regulators, another issue arose which had earlier been backgrounded by reference to the purely technical character of network regulation: Increasingly concerns about democratic accountability were raised as the regulators came into a role where they had to exercise discretion on matters of weighing different values (economic, social and environmental) against each other (Helm, 2004d). Concerns for democratic accountability in turn brought up calls for re-contextualising regulation in the utilities into broader policy contexts, specifically re-establishing political guidance over what was originally conceptualised and set up as "independent regulatory agen-

cies" (and then acclaimed and emulated as a central institutional innovation in the regulation of utilities).

All this brought about a re-orientation in British regulatory policy from constructing shielded and self-contained regulatory mechanisms, machine-like institutional artefacts, as it were, which could be expected to produce technically optimised output, to a re-opening in which dynamic interaction of regulation with broader contexts and respective adaptive capacities took a central place. The new labour government that moved into office in 1998 passed new legislation in 2000 that took up the shifts that had occurred. The Utilities Act can be read as redirection of design work, in substance as well as in procedure. In terms of procedure "the new law enabled energy minister to issue guidance to Ofgem to take into account environmental and social objectives. This was done in 2002 by drafting a social and environmental guidance to Ofgem" (Bauknecht, Schrode, 2007:10). In terms of substance, the changes "were in part designed to raise the importance of social and environmental considerations alongside the economic ones." (Green 2004: 2). Upon the Utilities Act, the model of economic regulation that had been elevated into a cosmopolitan standard became officially discarded as the exclusive orientation for the design of network regulation in the UK.

The next developments are envisioned by Helm (2004e) in a paper on the new regulatory agenda. The "idea of 'independent' regulators and 'independent' regulatory offices (…) is at best a relative and much over-hyped concept" and thus the focus must be "on how better to define the relationship between regulators and the state, rather than trying to deny it exists" (Helm, 2004f: 9). Then, the next step is one of institutional design: "regulation cannot be one-dimensional (…) Different regulatory bodies, each with one of the market failures to look after, will conflict and the outcome will be as much about their relative organisational muscle, as about the 'right' trade-off. (…) Institutional design is therefore a crucial component of regulation and has a significant influence on the outcomes." (Helm, 2004g: 16).

Parallel to this re-orientation of regulatory policy in the UK and in a sense anticipating the need for local, customised instruments was a renunciation of the idea of "simple first-best regulatory designs" as a basis for coordinating design work on the level of the global expert community (Midttun, 2005). Instead something like a modular design approach was pursued, based on a somewhat hierarchical structuring of the design space. On the highest level of designing network access regulation, the general operational principle of allowing for competition in utilities by granting open access to the network infrastructure remains. On lower levels there are various components like the form of vertical separation of network services, the institutional arrangements and the criteria

and methods that are applied to regulate the activities of network operators.[59] Thus, this approach, in a way, mirrors the actual developments that have taken place when in different sector contexts general prescriptions by the European Union or the World Bank and the IMF have been filled in with partially diverging, customised designs. There are, by now, different methods to determine prices and access conditions to network services in order to ensure that monopoly rents are avoided (e.g. rate-of-return or price-cap formula), quality of service is maintained (e.g. standards or incentives) and competition in other market segments is not distorted (e.g. deep or shallow connection fees). And various approaches to access pricing and allocation of network capacity, such as nodal prices, distance related pricing, postage stamp tariff, auctioning of capacity, first come first serve, priority access for incumbents or renewables. These have also been combined in different ways (OECD, IEA, 2001: 35-36). Similarly, there are various models of regulatory institutions such as antitrust law and authorities, regulation by ministerial supervision, arm's length agencies, independent regulatory agency, associations' agreement, watchdogs, procedures for public participation, non-sectoral and cross-sectoral arrangements. All of these have proven to be working more or less well in the right context. Some of the customised developments have remained isolated applications. Others, however, have provided new components to a global repertoire of building-blocks for constructing configurations that work in context.

Instead of a competitive search for one single best solution (which was needed for boosting the regulatory reform agenda and would prepare the way for more differentiated regulatory developments in contexts of application) there is now loosely coupled development work for components that fit a hierarchical modular structure. The context in which this kind of development takes place can thus be described as a 'scattered regime structure'. Scattered, as I have shown, but still a regime. The earlier dominance of design along the economic standard model of regulation had given rise to a global expert community. The existence of a consensus on basic design features furthered networking and cooperation, and made it easier to mobilise resources for building up institutions like professional associations and institutes and degrees of 'regulatory science'. "Regulation is now an industry which has spawned its own profession, with academics, lawyers, consultants and civil servants all contributing. There is a Better Regulation Task Force, and a Regulatory Impact Unit, university courses in regulation and European forums for regulators" (Helm, 2004a: 7). This global expert community continues to exist. It comprises actors from vari-

[59] The hierarchical design structure, as Murmann and Frenken (2006: 940) note with regard to technological design processes, "implies that there can, in fact, be dominant designs at a higher (more encompassing) level without there being any dominant design at the lower level".

ous organisations and professions such as regulatory agencies, universities, think tanks, ministries, competition authorities, administrative courts, parliaments, EU administration, the European Court of Justice, and regulatory fora. These various organisations all play a part in the process of regulation and thus in developing its practices (Böllhoff 2002).

An important element of the scattered regime are networks of regulators (Eberlein, Grande 2005). In Europe, networks of regulators have deliberately been pushed by the European Commission as a way to create alignment between national regulatory practices outside of the institutional restrictions of issuing formal guidance in the form of directives. For electricity the EU Commission in 1998 has launched the so-called "Florence process" which "brought together representatives from all the relevant stakeholders and member states along with the Commission and the CEER [Council of European Regulators]." The Florence process grew into the Florence School of Regulation (FSR) which, funded mainly by large utility companies,[60] became an institutional stronghold of the global regulatory design community. It was founded "with the intention of creating a point of reference for regulatory learning, debate and research (…) in order to draw on the knowledge and experience accumulated in different countries and different periods of time. (…) Before now, there had been no place where the specialists of academia could meet with practitioners and the representatives of these industries to discuss openly regulatory issues (The Workshops operate under the Chatham House Rule) in a continuous framework ensured by a stable structure. The FSR provides a permanent forum for research, communication and consensus building in which to find the appropriate balance among institutions, to identify the best economic and legal instruments, and to ensure that regulators reach adequate levels of efficiency, independence, accountability and democratic legitimacy."[61]

I have quoted the mandate and activities of the Florence School of Regulation at some length because they indicate strong interactions and learning in the regime, now also with regulators involved. It also shows a way in which efforts at harmonisation continue, at a conceptual level as well as with regard to actual configurations: the European Commission has launched the "Florence Process". This is just one component in the efforts of the European Commission. It continues to play a central role with various relaunches and revisions of internal market directives for electricity, telecommunications, gas and railways. In electricity, an "acceleration" directive for the internal market mandated Member States to adopt regulated network access as the only allowed option and tight-

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60 http://www.iue.it/RSCAS/ProfessionalDevelopment/FSR/pdf/FSR_Governance.pdf

61 http://www.iue.it/RSCAS/ProfessionalDevelopment/FSR/pdf/FSR_Profile.pdf

ened prescriptions for vertical separation of network services by making legal unbundling compulsory in 2003.[62] This implied that the special design of negotiated associations' agreements in Germany had to end. Legal measures were also put in place against Belgium, Greece, Latvia, Luxembourg and Spain.

A general strategy of the European Commission is to liberate network regulation from the constraints of local political dynamics by moving regulatory responsibilities and competences to the European level. Member State governments regularly resist these kinds of proposals, but the Commission was successful in 2003 in establishing a permanent working group of regulators for electricity and gas. In 2006 the Commission put another log on the fire by articulating strong critique of vertical integration, market concentration, discrimination in network access, and by proposing a European regulatory agency and ownership unbundling in a Green Paper for a European energy strategy.[63] In 2007 the Commission announced that it considers a further directive with ownership unbundling and cooperation of European regulators to be enforced in 2-3 years[64].

Similarly in telecommunications the European Commission continued to work out new proposals and push forward directives for harmonising regulatory design for network access across Europe (Jamasb, Pollitt 2003; European Commission 2003). In 1997, 1998, 2002 follow-up directives to the liberalisation directive from 1990 were passed. In 2004 a group of European regulators became established for telecommunications.

The world of utility governance is far from where it was twenty years ago. The development of network access regulation created a different trajectory as the one that was apparent before design ambitions were running high, spurring political productivity, in some places even activism, in reconfiguring the utilities. Even if actual configurations do not represent faithful reproduction of the proposed dominant design, it clearly left an imprint. And there is more: Regulatory reform, distributed experimentation, special expertise, global professional networking and organisation, ties to international institutions and the creation of regulatory agencies amount to a socio-cognitive design infrastructure. Governance in utilities, locally and globally, is deeply embedded in it. This infrastructure works to align ongoing local reconfiguration with ongoing cosmopolitan

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62 15 July: 2003/54/EG, replaces 96/92/EG.

63 Commission Decision of 11 November 2003 on establishing the European Regulators Group for Electricity and Gas (2003/796/EC), Communication From The Commission To The Council And The European Parliament (COM(2006) 841 final) and Green Book "Towards a European strategy for the security of energy supply".

64 Neelie Kroes, Commissioner for Competition Policy, 30 March 2007 at the 'High-Level Workshop on Energy', Berlin.

design. Although less visible and appealing than in the 1990s network access regulation takes place as a global design process in which modelling and reconfiguration are coupled. This happens, for example, in networks of regulators, scholarly discourse, professional education, and persistent efforts of international organisations to create convergence through framework regulations and benchmarks. The latest phase of network access regulation can be understood as dynamics of a scattered regime. Design work in different locations and at different levels is loosely coupled, no specific design exerts dominance over others, but a general socio-cognitive infrastructure orients policy design and contributes to the accumulation of a shared repertoire of theory, exemplars of specific institutional components and methods for carrying out regulation. As such, network access regulation remains a site of ongoing structuration and a breeding ground for new alignments and possibly more solid regime structures in the future. Current developments in utility governance cannot be understood without reference to these coupled dynamics of local and global design processes and their co-evolution with broader dynamics as they emerge in interaction with new problem definitions and shifts in institutional authority.

7.7 Conclusions

In the conclusion to this case study, I discuss how the phases of the innovation journey worked out for network access regulation. I do the same for the innovation pattern of 'dynamics pull' that I expected to be replicated in this case. Additional insights with respect to design and dynamics are presented for network access regulation as a 'pampered' instrument cherished in the context of the agenda for regulatory reform.

7.7.1 Phases

Looking back at shifts in the development of approaches to utility governance and finally the emergence and development of a design of network access regulation we can see a first transition when deregulation experiments were started in the utilities. This happened at the end of the 1970s. Established governance structures and regulatory practices were abolished with the idea of letting the 'invisible hand' of market competition take over the role of public regulation. This brought up problems with competition that were dealt with in various ways in the context of protected spaces for experimentation opened up by a strong regulatory reform agenda in some key countries.

While these experiments addressed a variety of issues, a next shift occurred when in repeated experiments across several sectors in the UK network access became identified as a critical problem for competition in the utilities, and an

articulated design for network access regulation emerged from the accumulated experience. This design quickly became widely recognised and taken up as a solution for the liberalisation of utilities and advance of regulatory reform. Reconfiguration projects for utility governance started throughout the world, legitimised by the availability of regulatory 'technology' to solve the network problem. Additional concepts, in particular reverse salient and critical problem, allowed me to capture what happens during such a period of expansion, as these concepts were developed for analysing "system building" in the evolution of technological systems (Hughes, 1983; Hughes, 1987).

Soon after, another shift occurred when implementation experience showed divergence of designs, persisting problems with competition and some outright system failures. Together with the weakening of the regulatory reform agenda this led to another opening up of design work to search for solutions in distributed experiments, loosely coupled by a modular design framework that was developed in the phase of cosmopolitan diffusion, and survived.

Thus, there is a journey of four phases that resemble the ones from the original heuristic. Some important adaptations had to be made in this case, however. This is due to a different dynamic than the one presumed by the innovation journey concept from product development, i.e. an 'outward development' from new options as nuclei that positively shape innovation through a promise. This case does not start with a promise, but with a desire for reform. The critical passage points in an 'outward' innovation journey can still be used as a heuristic, in order to find equivalent steps for an innovation journey that does not expand, but is filled in.

There may well be periods in which nothing like a policy instrument or would-be instrument is visible. Yet, such periods seemed to be relevant for the accumulation of 'material' from which the instrument became assembled (or reassembled). This happened with liberalisation in the utilities before 1987. A next critical passage point for the development of a policy instrument is then the 'gelling' of a floating repertoire and distributed experiments into something like a stable approach, an articulated operational principle that orients the further search for solutions by promising a specified performance. Further work on the instrument occurs, both in general, as a somewhat context-independent design, and in local adaptations to create a configuration that works. In the case of network access regulation, modularity of the instrument allowed it to do both, and thus survive, even if precariously.

7.7.2 Innovation pattern

Dynamics dominate over design, which is what characterised the ideal-typical innovation pattern ('dynamics pull') for which the network access regulation case was selected as an instance. This pattern was indeed matched in the case,

as was already clear in my discussion of phases in the innovation journey. Broader dynamics opening up spaces, with requirements for the instrument to be developed, 'pulling up a solution', raising a technology that supports expansion of deregulation to the utilities, rather than an instrument which grows 'from within'. Broad dynamics of neo-liberalism and deregulation linked to conservative governments moving into power were crucial, but at the same time the role of instruments being available to solve critical problems and overcome reverse salients is visible. There is mutual stabilisation of instruments and larger agendas, but when the larger agenda shifts, in this innovation pattern the instruments have to follow. So what appears as a solution to the deregulation problem is "pulled" out of the context of UK privatisation as a cosmopolitan tool that makes deregulation possible. Here, the cosmopolitan design of a 'standard model of economic regulation' only survived in connection with problem and authority. And when the neoliberal reform agenda started to unravel, the design also opened up to include broader political concerns in regulation.

While, generally the innovation pattern dynamics pull is matched by the case of network access regulation, one can also see, in parts of the innovation journey, another pattern. In the extended phase of experimenting with deregulation before a cosmopolitan design for network access regulation emerged, it is difficult to speak of the development of a policy instrument, because all that was visible at that time was the problem of introducing competition in the utilities – without an instrument being available that could be 'chosen' to solve it. What became visible towards the end of the phase, however, is that these experiments did not take place in complete isolation, even though they were not integrated 'top-down' by common design principles. Rather, they were loosely connected by the circulation of experts, design approaches, experiences and elements of theory on utility regulation. Over the time these bits of knowledge accumulated and formed a repertoire of commonly available concepts from which designers in local setting could draw when they cobbled together what appeared to fit the local requirements. It is worthwhile to speak of a specific innovation patterns in which neither governance dynamics, nor the momentum of design dominate, but where innovation in governance takes place as something that can be called 'repertoire learning': the accumulation of a shared pool of generally compatible bits of knowledge, skills, institutional devices, etc. which are picked up, adapted, further developed and combined for reconfiguration work in local governance contexts.

In such a pattern, particular instruments are not fully articulated or, if they are, they are precarious. There are still things to be learnt about instrumentalities. The survival and effectiveness of more comprehensive models depends on linkage with and support by variable context conditions. Designs may emerge and vanish as broader political agendas or conditions of implementation un-

dergo shifts. For the recent period, I diagnosed the situation as that of a scattered regime. One could again speak of an innovation pattern of repertoire learning, because the basic characteristics are in place, even if there is now much more experience and sophisticated analysis available. Ongoing developments in utility regulation are shaped by a 'loose' coupling of local configurations through "networks of regulators" (Eberlein, Grande 2005) and a 'soft' embedding in a scattered global regime. Thus, local-global learning takes place (e.g. in the continued reconfiguration of utilities in the EU).

Without dominant design and strongly institutionally integrated design community, the nature of learning is different, and will be based in networks that circulate and accumulate repertoire of design elements for customised combination. Over the last years gradual stabilisation of design for network access regulation seems to work 'bottom-up' to support a new/revised general political orientation (e.g. discursive, participatory regulation for integrating diverse aspects of sustainable development objective instead of economic efficiency-oriented regulation).

7.7.3 Ironies of a pampered instrument

Additional 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 frequently 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 specific 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 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 idiosyncrasies 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 for the broader agenda which they should support to be moved ahead. 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. It does not take effect in local configuration work, however, in which

politics and institutional dynamics mess up neat designs and complicate the realisation of promises from governance models. In this case, co-evolution strengthens the model life of instruments; it actually 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.

The linkage to global agendas can provide 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 military 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 the OECD, the World Bank/the IMF and the 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 that actors who cherish the instrument for helping them materialise 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 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 reconsideration of 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 when it goes against their case.

8 Conclusions

Conclusions will be drawn in this section, starting with the questions that were addressed in the case studies and in the conceptual chapters. Then I will broaden out, first to the identification and discussion of a few key findings that merit being highlighted and developed further. Then I will move on to further thoughts and further work, including some thoughts on implications for policy and strategy of a reflexive perspective on designs on governance.

8.1 First-round conclusions

First-round conclusions focus on what can be learnt from the use of the reflexive governance perspective and its application to the study of policy instruments (Chapters 2 and 3) and the conceptual framework developed in Chapter 4 to analyse the two cases chosen for detailed empirical study. This is complemented by a discussion of the scope of such conclusions when based on only two, and two quite specific, cases.

8.1.1 Recapitulation

The starting point for the thesis was the apparent paradox of policy instruments: On the one hand, the concept had become fundamentally criticised and deconstructed in political science research. The metaphor of a tool, with its message of inherent, universal effect of the policy instrument, and the existence of a toolbox with self-contained elements of policy-making, which is allegedly neutral with regard to political values and ideology, were shown to be misguided. On the other hand, policy instruments moved onto the centre stage in the practice of public policy, policy analysis and political debate. Public policy, since the middle of the 20th century, has become a matter of instrumental rationality and technology, of arguing means-end relations and constructing working designs, rather than arguing over political identity or ethical tenability and practicing style and morality.

I related the apparent paradox to a general issue of governance as being about intentional design as well as emergent dynamics. ‘Design’ is embedded in dynamics and effects are co-produced through the dynamics, while ‘dynamics’ arise from attempts at design and intervention, but not in a straightforward linear manner. Thus, policy instruments can be seen as leading a double life, a life as models of governance that embody the promise of control and a life as real world configurations in governance that exhibit contextualised political dynamics and escape the intentions of design. The precarious instrumentality of policy instruments is captured in the phrase ‘designs on governance’.

This notion of design on governance places the interaction (including tensions) between modelling governance and reconfiguring governance at the core of the working of policy instruments. Analysis of the historically embedded processes in which model and configuration interact, change and produce a trajectory, is more important than comparative studies of effectiveness. Such an analysis also allows, then, a better understanding of changes and sometimes novel patterns in governance.

A key step was the recognition that insights and concepts from technology and product innovation offered useful heuristics for the empirical study of processes in which 'model' and 'configuration' interact and evolve over time. In a sense, policy instruments are then positioned as societal technologies – but as recent technology studies have emphasised, even technological technologies are socially constructed. The development of policy instruments could thus be studied as an innovation journey, including innovation in governance. The translation into a conceptual framework for empirical studies of policy instruments also required seeing them as one 'stream' in broader governance dynamics that result from the interaction of this 'technology stream' with problem formulation and political struggle for authority.

First-round general conclusions about the framework and the findings in the case studies (in addition to the specific conclusions for each of the case studies in Chapters 6 and 7) will focus on two key aspects of the framework. Firstly, the occurrence of specific innovation patterns that reflect different forms of co-evolution between policy instruments and broader governance dynamics, with design push and dynamics pull as two ideal-typical extreme cases. Secondly, the historical reconstruction of phases of the innovation journey linked to critical 'passages' in the development of policy instruments, from new options to proof-of-principle in protected spaces, from there to embedding of prototype, and then branching out and regime formation.

8.1.2 Innovation patterns

'Design push' depicts a pattern in which the innovation journey is driven by a policy instrument's own dynamics. I speculated that in such a case the development of a policy instrument would appear as a breakthrough story and in any case as a supply-driven development. The second pattern used to select a case is 'dynamics pull'. Here, the innovation journey is dominated by broader dynamics. For this pattern I speculated that policy instrument development would be induced and shaped by demand emanating from dynamics in the problem and authority stream. Designs on governance would, so is the speculation, be cultivated and policy instruments be raised to establish themselves in close linkage with a political agenda.

The empirical case studies match the patterns for which they were selected quite well. The dynamics of the policy instrument of its own are clearly visible in the case of emissions trading - for example, when Project 88 prepared the ground for embedding a prototype in US environmental governance or when voluntary pilot schemes were set up by BP and Shell and later by the Emissions Trading Group in the UK, before demand by policy makers for a new instrument had been articulated. In contrast, there is the story of network access regulation that includes a long period of distributed experiments with deregulating utilities from which a policy instrument was raised. Spaces for experimentation were kept up and protected by a strong agenda for regulatory reform, stabilised by a linkage between the problem of inefficiency in utilities and coalitions of actors that rode this wave to conquer positions of authority. What appears as a solution to the deregulation problem is 'pulled' out of the context of UK privatisation as a cosmopolitan tool that makes deregulation possible. Here, the cosmopolitan design of a 'standard model of economic regulation' only survived in connection with problem and authority. When the neo-liberal reform agenda started to unravel, also the design became opened up to include broader political concerns in regulation.

While the cases appear to instantiate the theoretically derived patterns of innovation in governance, there are some nuances visible in the cases. Both cases clearly show the co-evolution of instruments with context dynamics. The innovation journey of emissions trading as a case of design push is also strongly influenced and shaped by governance dynamics, as is visible, for example, in the linkage with an increasing confrontation between the environmental movement and business interests. Emissions trading was dependent on these developments in the societal landscape to which it could link up, bypassing the established regime of command-and-control regulation, in order to receive the necessary support in terms of protection and resources. Other examples are the opening created in European climate policy by the withdrawal of President Bush of the USA from the Kyoto Protocol or the fact that the 'energy tax' which was positioned as a competing instrument to emissions trading got caught up in the institutions of decision making in the European Union.

Network access regulation, on the other hand, also shows dynamics of its own and influence on problem and authority stream. It was the emergence of a trajectory from the multi-sector experiments in the UK that made cosmopolitanisation possible and allowed for the global diffusion of liberalisation policies. Without the instrument as it then stood, regulatory reform would not have gained so much ground.

While generally the innovation patterns of design push and dynamics pull are matched by the cases, the case study of network access regulation revealed, in parts of the innovation journey, a developmental pattern that cannot easily be

fitted with either design push or dynamics pull. This concerns the extended phase of experimenting with deregulation before a cosmopolitan design for network access regulation emerged from later stages of the UK experiment. For this phase of distributed experimentation it is difficult to speak of the development of a policy instrument, because all that was visible at that time was the problem of introducing competition in the utilities – without an instrument being available that could be 'chosen' to solve it. Reconfiguring governance in the utilities at that time was a matter of ad hoc try-outs without guidance by an articulated or even proven design. Accordingly, different approaches were adopted in Chile, the USA, the United Kingdom and New Zealand and configurations emerged drawing on local precursors and traditions (such as technocracy in Chile or the essential facilities doctrine in the USA). What became visible towards the end of the phase, however, is that these experiments did not take place in complete isolation, even though they were not integrated 'top-down' by common design principles. Rather, they were loosely connected by the circulation of experts, design approaches, experiences and elements of theory on utility regulation. Over time these bits of knowledge accumulated and formed a repertoire of commonly available concepts from which designers in local settings could draw when they cobbled together what appeared to fit the local requirements. Thus, even if there was no design for a solution that would fit all the particular sectoral governance contexts the connectability of local experiences was facilitated by a common general problem definition. This supported contribution to the accumulation of a shared repertoire of building blocks and made learning across various experimentation sites possible without the need for a dominant design. Later, when disappointment followed the hype for economic regulation of network access as a cosmopolitan policy instruments it seems as if a similar pattern has set in again. The case study accommodated this type of loosely coupled design work with the notion of a 'scattered regime' structure. It may well be worthwhile to articulate it as a specific innovation pattern in which neither governance dynamics, nor a design's own dynamics dominate and bring about a policy instrument, but where innovation in governance takes place as something that can be called 'repertoire learning': the accumulation of a shared pool of generally compatible bits of knowledge, skills, institutional devices, etc. which are picked up, adapted, further developed and combined for reconfiguration work in local governance contexts.

In general, of course, patterns in the co-evolution of design and dynamics, of policy instruments and governance, lie on a continuum between the extreme cases of instrument push (one innovation journey driven by internal dynamics), and governance pull (master narrative, dynamics in governance contexts leading to ad hoc implementation), and repertoire learning will be one pattern among many where smaller and larger journeys intermingle, innovation is diffuse, and

mutual influencing of internal dynamics and governance context takes various shapes. And there will be changes over time, because interaction also depends on the maturity of the policy instrument, as is clear in the difference, in the network access regulation case, between the situations in the early 1980s and in the early 2000s. Nevertheless, it is useful to distinguish a small number of ideal-typical cases with which actual developments can be compared and better understood.

8.1.3 Phases

If policy instruments are not always clearly distinguishable, it may be difficult to follow them, even if there is some learning in policy development and about the instrumentality of particular approaches. Nevertheless, one can attempt a reconstruction in terms of an unfolding innovation journey (or journeys), and distinguish phases – as in the phase heuristic that guided the empirical studies. While the four phases that I distinguished in the conceptual framework, using insights from technology and innovation studies (1. emergence of new options, 2. first developments and proof-of-principle in protected space, 3. embedding of a prototype, 4. branching out and regime formation) may not always be visible in exactly this way, the key point is that there are processes of gradual irreversibilisation and increasing scope that can be taken as first-hand measures for the reconstruction of processes by which policy instruments – potentially – come into being. One finding from the case studies is therefore whether they could be structured according to the four phases.

The emissions trading case proved to be a clear-cut example of a trajectory that can very well be captured with the original phase heuristic. Critical transitions as known from product and technology development can be adopted almost without any adaptation to reconstruct the development of this policy instrument. There are new options in economic theory and practice of regulation, pressure on the existing regime opens up interstices, landscape developments provide protection for experiments with new market based regulation, first developments deliver proof-of-principle, strategic networking paves the way for a prototype, repair work is done to make it work in reality, the working configuration branches out within the governance domain and beyond it, via the global level, into other jurisdictions and problem areas, local implementation sites become overarched by a global technological regime, a rule system and infrastructure for developing and operating emissions trading in various contexts.

The case is different for network access regulation. There, it was not possible to apply the original phase heuristic to make sense of all the aspects of the innovation journey. Going back in history in search of development processes that later linked up to bring about network access regulation did not reveal a

continuous sequence of events that gradually built up into a trajectory (as in the case of emissions trading). Nevertheless, periods with little or no focus can still be relevant for the accumulation of experiences and insights from which instruments can be assembled later. As noted, this was the case with liberalisation in the utilities before 1987. The critical passage point for the development of a policy instrument is then the 'gelling' of the repertoire and distributed experiments into something like a stable approach, with an articulated operational principle that orients the further search for solutions.

The picture of such an adapted innovation journey is one in which a phase of "softening up" of existing regimes is followed by the opening of spaces for experimentation. These experiments are not characterised by the attempt to make a specific design robust for implementation, but by fitting a solution into a problem space. This comprises diagnostics and trouble shooting.

In conclusion the phase structure of an innovation journey proved very useful as a heuristic. It was perfectly able to reconstruct and explain the emerging trajectory of emissions trading. And it proved amenable to adaptations when necessary, as in the network access case. Whether this can be rephrased as an alternative phase heuristic is not clear. One would need to reconstruct other, possibly similar innovation journeys to find out.

8.1.4 Scope of conclusions based on the case studies

Can the insights drawn from the two cases studied be expected to be valid also for other policy instruments and innovation processes in governance? To begin with, it should be noted that 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. Furthermore, they have been selected on the basis of the fact that there was enough of an innovation journey visible to enable the conceptual framework to be applied. There might be other specifics, like the emergence of expert networks up to the formation of a "carbon industry", as a global business sector in emission trading services. A large part of the implementation of public policy is then delegated to non-governmental actors, which is not a general feature of policy instruments (but may well be more widespread as the recent governance discourse suggests).

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. The conclusions in 8.1.2 and 8.1.3 support such assessment.

I can indicate - even if somewhat speculatively - what to expect when the approach is extended to other types of cases. In a first step, it must be possible to extend the insights to other economic instruments. Examples are eco-taxes, feed-in tariffs for renewable electricity, micro-credit schemes, and revolving funds for energy efficiency projects. Economic instruments can benefit from the science of economics claiming to offer a universally valid theory of society, from which operational principles are derived on which models of governance can be based.[65] Academic and professional communities of economists thus provide a worldwide knowledge infrastructure. In the case of economic instruments, design is often based on cosmopolitan models before it becomes localised. For analytical purposes this is convenient, because it makes it easy to follow the innovation journey of such instruments.

One can think of a variety of examples. Microcredit (also "microfinance") is interesting as another policy instrument based on economic theory and one whose innovation journey seems to be comparable to that of emissions trading. Microcredit even parallels the emissions trading case in that it is linked to the creation of a new business field (in this case the opening-up of low-income sectors, mainly women in rural areas in developing countries, for commercial banking services). As with emissions trading, we also see in this case a strong momentum and global diffusion connected to the establishment of an institutionalised design community with specific journals and transnational organisations and linkage with global authority embodied in the World Bank and the European Commission. The case of microcredit might therefore, upon closer investigation, present another example of a design-push pattern of innovation in governance, while the difference in form, supported goals and contexts of implementation may lead to differences in the specifics of the innovation journey.

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[65] I am not implying that such models are always good models. The mechanical character of economic theories as compared to many other theories of society, and their confinement to efficiency as a sole normative measure for innovation, makes it possible to construct rather simple and self-contained instruments. The development of such instruments is advantaged by the possibility to define universally applicable operational principles and generate strong expectations with the help of model simulations. While this is connected with the need for local repair work and unintended consequences when such instruments are implemented in real world contexts, it does foster the stabilisation, diffusion and institutionalisation of respective designs.

For instruments other than economic ones, 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, which I mention because I am somewhat familiar with it, 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.

I add that in the case of a nascent instrument the conceptual framework developed in this thesis can be used for prospective studies of innovation in governance. The complexity of possible dynamics can be captured in the form of scenarios which articulate different possible patterns of future development such as a breakthrough and repair-work pattern, a bricolage and repertoire learning pattern or a erosion of design and disbandment pattern.

Finally, there are situations with regard to which one would probably not even speak of policy instruments or where policy instruments would not be recognised, because design and dynamics, modelling and configuration work are so deeply intertwined that a separate cosmopolitan design apart from localised practice is not discernible. The model then lives in the communication and interaction of actors who design a new configuration in practice, develop models and reconfigure at the same time. Activities specific to third grade structuration (see Section 2.4.1) are not delegated to global design communities and bring about specific dynamics of policy instruments that are typical for decontextualised model development. Instead design takes place in the context of implementation. And whatever is the equivalent of policy instruments now remains embedded in the practices of the domain, designs do not travel. One could argue that this is the primordial form in which innovation in governance took place before policy instruments came into existence. This places such cases, in a sense, outside the scope of my analysis. Nevertheless, one can find small and tenuous occurrences of somewhat independent designs, which may have a life of their own. And one can definitely use my approach to study how such primordial forms have, over time, evolved - up to creating some division of design labour (see Section 8.2 for a more detailed analysis).

8.2 Key findings to be developed further

Apart from specific first-round conclusions on how my conceptual propositions worked out in the case studies I discuss, three key issues that capture additional insights, given the overall theme and approach I have adopted. These are, firstly, the phenomenon of a division of design labour in policy-making which introduces a cosmopolitan dimension to the design of governance change; secondly, the social life of policy instruments that adds to established understand-

ing of policy instruments; and, thirdly, the particular way in which a focus on form enables political reconfiguration as it allows for the creation of alliances in the shadow of democratic politics.

8.2.1 Division of design labour

The central notion of designs on governance allows for some division between design as models (and their productive illusions, cf. Chapter 2) and design as coping with ongoing dynamics in reconfiguring governance structures within particular contexts. There might be a tension, and this appears in the development and further journey of policy instruments with their two lives (cf. Chapter 3). 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 (by design of alternatives and initiation of reconfiguration projects in local governance contexts, i.e. third grade structuration, cf. Chapter 2) is linked to the development of cosmopolitan models of governance within global design communities. [66] 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. In both cases, the understanding of

[66] 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.

observed dynamics in governance requires an analysis of how local design work on creating configurations in context interacts with global design work for the development and refinement of models. The interaction between these two types of design work could be seen to happen in different forms on a continuum between the domination of local design through global design (e.g. through standard setting, as visible to some extent in the EU Emissions Trading Scheme) to the demolition of global design through diverging local design work and/or local malperformance of the global design (as was to some extent the case with regard to the 'economic standard model of regulation' for network access).

One function of cosmopolitan design work and the models that develop from it is that it establishes a link between local design work in various different domains. Actual policy instruments could thus metaphorically be understood as cosmopolitan construction-sites of governance, rather than mechanical tools. They function as a hinge between concrete practices in local contexts and generalised models of governance and provide a nexus between various local domains and global expert communities. Actual policy instruments thus have an important role in organising the division of design labour between global and local level.

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 "cosmopolitan institution building" (Grande 2006). What is highlighted here is the embedding of policy-making in a global socio-cognitive infrastructure of designing governance.[67] 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.

Having seen this, one must also consider the possible isolation of design (work) from contexts of implementation, as happens with the development of cosmopolitan designs on governance. This has two kinds of effects: it enhances

[67] 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."

political productivity and it creates risks of uncontrolled policy outcomes additional to the condition of embedded design. The cosmopolitanisation of design and establishment of a global expert community make a policy instrument stronger, but at the same entails more and more encompassing repair, if designs are implemented. Emissions trading is an example for a triumphant model of lean and efficient governance that is linked to a reality of highly complex regulatory systems that serve all kinds of rent seeking interests. For network access regulation the difference between the global design and local configurations is now very visible, and seen as a challenge in itself.

8.2.2 Social life of policy instruments

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.

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 has special expertise in relation to the governance model. These actors are policy analysts who know about the working of a model configuration because they have been involved in previous developments or because they have modelling tools at their disposal. 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.

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. This can take the form of actual authoritative standard setting as is the case within the (limited) capacities of the EU Commission to enforce convergence in emissions trading and network access design in member states. It can also take a more informal form like the setting of benchmarks and praising and shaming local design according to global design criteria (Paasi 2005; Papaioannou et al. 2006).

There are further implications and observations, which may be taken up in further research. 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 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.

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, imple-

menters, 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.

8.2.3 The many roles of policy instruments as technical models of governance

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 defacto governance within a particular domain. Policy instruments can be said to induce and guide third grade structuration processes (cf. Chapter 2) 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.[68] Actors who

[68] A similar assessment is formulated by Lascoumes and 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 oth-

are interested in evading effective regulation of their activities may apply the tactic to concentrate attention and capacities in debates on the form of governance in the hope to be able to work for amenable parameter settings in a blind angle of public debate where the technical details of implementation are negotiated.

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 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. Of special importance are so called “helping interests” that profit from setting up and maintaining the new institutional order that is envisioned by the instrument. The London City and its role in setting up a pilot scheme for greenhouse gas emissions trading is a salient example (see for a similar point with regard to technology intensive environmental polices Prittwitz, 1990).

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.

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ers. 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."

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 distantiation 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 (I do come back to such questions in my more evaluative discussion in Section 8.3), 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.

8.3 Further thoughts and further research

One element in the overall perspective of designs on governance is how governance innovation (and the social structures that build up around it) is a process with own dynamics of structuration, independent of, but interacting with problem articulation in public discourse and the political struggle over institutionalised positions of authority. The so-called technical component that is brought in through policy instruments reinforces such own dynamics, but, as I have shown, always as part of larger co-evolutionary processes.

This would allow an interesting take on comparative studies: Investigate conditions for such governance innovation, by looking at different national policy cultures as niches from which different policy innovations emerge, for example, market based policy from USA, participatory policy from Scandinavia/NL, management from UK/NL, legal regulation and corporatist arrangements from Germany (Mayntz, 1997/1983).

Lateral, and over time cosmopolitan dynamics in governance change would be another research topic, which would link up to ongoing research by Grande (2006) and Thatcher (2007).

Instrumental rationality and issues of technocracy, and attending tendencies of de-politicisation, professionalisation, globalisation of policy-making (Lascoumes, LeGalès 2007) - including the role of science in policy-making (Hoppe 2005) -, could now be taken up also as elements in co-evolution with differential weight and dynamics that shift historically.

This perspective will also lead to a partial re-interpretation of the transformation in governance from the welfare state to the regulatory state (Seidman, Gilmour, 1986; Majone 1991; Moran 2002). Of course, the nature of these governance transformations is linked to power games and overall ideology, here neo-liberal ideology and goals of self-reliance and efficiency as the orientating frame for policy discourse. But the explanation of the transformation does not need to just start with a shift in political goals or with shifting power positions of political actors. There is also a battle between families of instruments which was fought on the grounds of technical performance and alleged political neutrality. This observation serves to modify (or add to) the point made by Lascoumes and LeGalès: "Our next hypothesis is that the importation and use of a whole series of public policy instruments are determined by the fact that the state is restructuring, moving toward becoming a regulatory state and/or influenced by neoliberal ideas"(Lascoumes, LeGalès 2007: 17). The rise of the regulatory state might come to appear as also driven by emerging technological trajectories in policy making as analysed for the innovation journeys of emissions trading and network access regulation.

In particular, my case studies draw attention to several 'active elements' or factors of influence coming in from other directions than what is usually looked at in political analysis. Shifts in goals may occur only after, and as a result of the establishment and diffusion of, new models of regulation. All cases of more fundamental and longer-term policy changes (in domains of environmental governance and utility governance) must be understood as a result of the interaction of shifts in problem discourse (towards governance as an efficiency problem) with rearrangements in authority relations (towards weakening of national government and increased power of global business) and with technological devel-

opment which produces new instruments and tries to push them into the political market (towards economic policy instruments).

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.

A specific ambivalence derives from how policy instruments introduce a technical rationality to the process of policy development and may thus be seen as enabling transcendence – or avoiding – of ideological conflicts (cf. Section 8.2.3) which would arise from a value rational approach to policy-making as it is predominant in political competition in front of the audience of the public (Mayntz, 1997/1983). Policy instruments nurture a technical discourse in policy research and practice which explicitly separates itself from disputes over goals, values or political ideology. Instead, policy is framed as problem-solving, a matter of improving functions of governance which can be evaluated irrespective of priority for certain goals and values (e.g. "there is no left or right economic policy anymore, only good or bad economic policy").

A further ambivalence starts with how the systematic development of policy knowledge that happens under the heading of policy instruments has the potential to enhance the productivity of the policy process. It enhances the repertoire of alternatives that go into discussions on policy design, allows for learning from experience across different governance contexts and accumulation of knowledge of what opportunities and pitfalls. It also delegates part of policy making (and political negotiation) to non-government actors.

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.

After all these critical evaluations of instrumentality of policy instruments as societal technology of governance, I ought come back to my overall perspective on the double life of policy instruments as part of reflexive governance. What happens if I attempt to translate the insights into design and dynamics in governance change and the important role of instruments as global designs of governance in inducing and shaping change into advice on specific orientations for political strategies to modify governance patterns?

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 while knowing about its role and its limitations (cf. Section 8.2). 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 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. Clearly, in outlining these two strategies the duality of design and dynamics returns, now at the level of strategies for reflexive governance.

The instrumentality strategy is well known, and can be evaluated as to its productivity (cf. above). The dynamics strategy is less well known – as an explicit strategy. So it may be useful to end this thesis with some examples of how dynamics can be turned into a strategy (this is inspired by contributions from Voß et al., 2006a).

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 and Olsen (1989: 94) 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." What I add is 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).

Clearly, there is more to say, and more should be said. But it is not a matter of specifying some model, instrument or strategy beforehand. If I take the les-

sons from my own analysis of designs on governance and their journeys seriously, it is important that things are set in motion, but it is hard to say where the journey will go.

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Appendix: utility deregulation experiments

This appendix provides more detailed descriptions of experiments with the introduction of competition that were undertaken from the end of the 1970s to the end of the 1980s in the Chilean electricity sector, the US telecommunications sector, the British telecommunications and gas sector and the New Zealand electricity sector. This provides some more background information for the phase of 'protected spaces and learning' in the innovation journey of network access regulation (Section 7.4).

Chile

In Chile the most clear-cut example emerged of a protected space for learning with new forms of governance in the utilities. This was due to special political circumstances after the military coup in 1973 which brought Pinochet into power and a group of committed neo-liberal reformers along with him dubbed the "Chicago boys".[69] With support from international financial institutions, the World Bank and IMF, they set up and implemented a radical restructuration

[69] In the early 1960s, UN CEPAL (ECLA) in Santiago de Chile was the main stronghold and influential centre of structuralist thinking (Raúl Prebisch), the developmental policy version of Keynesianism with a focus on protectionism and import substitution.

In 1955, Theodore W. Schultz, President of the department of economics at the University of Chicago visited the Faculty of Economics at Universidad Católica de Chile to sign an agreement of cooperation as a strategic move, "strong counter-attack against the spread of Keynesianism (and the ECLA approach which was seen as its Latin American version)" (Silva 1991:390). A select group of Chilean students were offered post-graduate training in Chicago (between 1955 and 1963 a total of 30 young economists made use of the Chicago grants; a list of 24 of them by name with positions they held in Pinochet government is given in (Silva 1991:391). In Chicago, they became followers of Milton Friedman (Capitalism and Freedom, 1962) and were convinced that absolute liberalisation, full introduction of totally competitive free market economy was the only solution to Chile's developmental problems. They went back and disseminated monetarist prescriptions at the Universidad Católica de Chile.

In 1968, the Chicago Boys established the CESEC think-tank, which drew up a program of right-wing candidate Jorge Alessandrini in the 1970 presidential elections. Within the Christian Democratic Party, however, the radical neo-liberalism was opposed by many and "put into cold storage as it was 'a programme difficult to implement within a democracy' as one leading businessman put it" (Silva 1991). The campaign managed to find some support from key businessmen, however.

programme for the Chilean state and society. It could be pushed through against resistance of the population and opposition parties on the basis of the military power of the dictatorial government. These uniquely comprehensive and radical reconfigurations of governance patterns across the society were labelled a "shock-treatment" or "neoliberal revolution". These reforms were legitimised as a neutral technical necessity.[70]

In a second round of privatisation, the electricity sector became subject to fundamental reform with regard to introducing competition (Serra, 2000: 84). In 1978, the National Energy Commission[71] formulated a new energy policy which was formalised in the form of a new electricity law in 1982 (Spiller, Martorell, 1996). These reforms acknowledged specific circumstances for the working of competitive markets in infrastructure sectors. As the dictatorial reformers had free hands, they did not have to aggrandise the promise of competition or downplay the risks of liberalisation. New and special regulatory legislation and respective institutional capacities were developed prior to privatisation and opening of the market for competition (Serra, 2000: 87). The new governance system for electricity was thus based on the separation of different stages of production: power generation, transmission and distribution; it also established

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[70] One of the Chicago Boys, Pablo Baraona, twice economic minister, speaks of the ideal of a "technified society", meaning "a society in which the most capable take the technical decisions they have been trained for … the new democracy must be technified, so that the political system does not decide technical questions, but the technocracy has responsibility for utilizing logical procedures to solve problems and to offer alternative solutions" (cited in Silva 1991:393). Von Hayek personally, as well as in his book 'The Road to Serfdom', provided the intellectual basis for expanding neo-liberal thought to the political and social sphere. He speaks of the need for a strong government to impose a system of general and impartial rules on society. Only the non-arbitrariness of market rules provided for real equality. In September 1980, a new "Constitution of Liberty" was adopted (named after Hayek's book of 1960).

[71] "In 1978 the National Energy Commission (NEC) was established. This is managed by a board of directors composed of six or seven Ministers and has an executive secretariat, technical staff and funds, albeit limited, to recruit advisors. The NEC proposes policies to be implemented through laws and by-laws, computes the regulated rates, and develops medium- and long-term guidelines for the sector. The Minister of Economics signs the decree setting the regulated charges and grants the licences. The final government player in this sector is the Superintendence of Electricity and Fuels, which was set up in 1985 as an administrative branch of the Economics Ministry. It supervises compliance with the law and regulations, monitors service quality, grants temporary licences, and deals with users' complaints." (Serra, 2000: 94-95)

rules for sharing the capacities of the transmission system and determining the fees to be paid this service.[72] (Serra, 2000: 94-95). Under these conditions, competition between generators and free choice of suppliers for large industrial electricity consumers was introduced and resulted in the promised drop in electricity prices and an increase in investments (Rudnick 1994: 4).

In the electricity sector, regulatory reform for competition came first and was the most pronounced, but the Chilean government also started experiments in other utility sectors. In telecommunications, licences for competing local phone companies were issued in 1981 to make up for a lack of investment by the incumbent monopoly (Serra, 2000: 107). In 1982, a new Telecommunications Act required public service providers to interconnect their operations to give their competitors access to the whole established network infrastructure (Serra, 2000: 91). In the gas sector, a similar approach was taken that included separation of transmission activities and the provision that "gas transport should be subject to an open access requirement; i.e. the service should be provided under non-discriminatory conditions" (Serra, 2000: 129).

The Chilean approach established a clear model to deal with liberalisation in utilities. Even if the new approach to governance "considers competition as the principal mechanism for market discipline", it was linked to the establishment of special regulations and a regulatory body to oversee them (Serra, 2000: 87). A central element of liberalisation was the abolishment of legal barriers to market entry (even in sectors for which price regulation was maintained, such as

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[72] "The law assumes distinct technical and economic peculiarities of the business of generation, transmission and distribution that condition their development and operation (… it) makes open access compulsory for transmission and distribution companies that are benefited by public rights of ways. They must allow third parties to utilize their installation if there is available capacity." (Rudnick 1994:3). "Generators pay the marginal transmission cost and a fixed basic charge. Given the existence of scale-economies in the construction of transmission lines, marginal costs do not fully cover total transmission costs. The difference between total costs and the revenue collected through marginal cost pricing, called basic charge, is allocated among generators. Thus it has to be decided what lines each generator and how to assign the basic charge for a line among the generators using it. The legislation only states that the basic charge has to be negotiated between the owner of the transmission grid and the generator, and that absence of agreement leads to a compulsory arbitration process." (Serra, 2000: 97-98) (…). "All licensed generating and transmission companies operating an electricity system are obliged to co-ordinate their activities through an Economic Load Dispatch Centre (ELDC). (…) Its responsibilities include planning the daily operation of the system (actual dispatch is handled by the transmission company) (…)." (Serra, 2000: 94-95)

water distribution) and mandatory interconnection and equal access rules for network infrastructures (Serra, 2000: 129).

In spite of these special provisions for dealing with network infrastructure, however, some severe problems with regard to competition in the utilities arose in the following years. These led to further amendments and a search for solutions. In electricity, a key issue was alleged anti-competitive behaviour by the dominant generating company that also owned the independently established transmission firm. "The legislation established that the generation companies and the transmission firm have to negotiate transmission fees, with lack of agreement leading to a mandatory arbitration process. However, this process tends to be lengthy, onerous, and has uncertain results. Other generating companies have complained that the transmission company favours its parent firm" (Serra, 2000: 91). In telecommunications, a very similar problem arose: "The 1982 Telecommunications Act required public service providers to interconnect their operations, but left it to them to decide the terms under which interconnection would take place. Small local phone companies encountered many difficulties in negotiating interconnection charges with the incumbent monopoly which delayed reaching agreement for as long as possible. Furthermore, regulators frequently lacked the resources to enforce the technical conditions of connections. The incumbent telecom monopoly has also exerted market power through its commercial policy" (Serra, 2000: 91).

USA

Another experimentation site in this phase of the innovation journey was the telecommunications sector in the USA. Here, selective attempts had already been made in the 1970s by the Federal Commission for Communications to pursue a pro-competitive policy against the incumbent monopoly provider AT&T. This was to some extent the result of increasing pressure from new technology manufacturers who lobbied for market opening with the argument that the incumbent AT&T blocks out technological innovation. With the successful deregulation of trucking and airlines and the new deregulation hype in the USA, the pressure rose to proceed in a more radical and comprehensive way in telecommunications also. Towards the end of the 1970s, the FCC therefore considerably tightened the reins on AT&T in enforcing market entry by competitors in the long-distance telecommunication business. A core issue was to mandate AT&T to grant operators of parallel long-distance lines access to the local distribution network and interconnection services (Schneider, 2001: 179-194). This met the resistance of AT&T. "AT&T staunchly denied that revolutionary technological changes called for a reversal of anticompetitive regulatory

policies" (Derthick, Quirk, 1985a: 26). The management of the company insisted on the responsibility for providing a public service, not a marketable good and fought for the protection of its exclusive right to serve the market in exchange for taking up this responsibility. The FCC established rules for fair access to local networks and developed new accounting rules for AT&T in order control cross-subsidisation of AT&T's long-distance services by overpriced services in the local distribution monopoly. This all proved to be ineffective, given the information edge and discretionary power of the large integrated monopoly company. Competition remained marginal and licensed firms kept filing complaints about AT&T's anti-competitive behaviour. These attempts at extending deregulation to the telecommunications sector produced some early lessons about the very different starting positions in this sector compared to trucking and airlines. "The telecommunications case is unlike the others in important respects. Given the fundamentally competitive structure of the airline and trucking industries, government regulation had only to fall away for the policymakers' underlying goal of enhanced competition to be realized. Reform was uncomplicated conceptually, and achievement of it was swift. The telecommunications case is quite another matter. (…) On what terms and with what corporate structure should it be allowed to engage in the new competition?" (Derthick, Quirk, 1985a: 18 then go on saying that they pay little attention to this question)

Finally, with the vital momentum of the general hype for deregulation in the USA, the Justice Department filed a lawsuit against AT&T concerning anti-competitive behaviour. Specifically, the company was accused of illicitly monopolising the long-distance market by making strategic use of its disposal over the bottleneck of local distribution networks. FCC demanded that the company had to divest assets in local distribution networks as a measure to enforce vertical disintegration of the industry into segments which are potentially competitive, like long-distance telephony, and those that are naturally a monopoly, like local distribution network services which were capital intensive and had high network externalities. At the end of the Carter administration in 1980, a tentative settlement was negotiated that inflicted behavioural rules and some divestiture, but left the company mainly intact.[73] In 1981 the incoming Reagan administration rejected the tentative settlement, because it did not seem to solve the underlying problem, and announced that it would "litigate to the eyeballs" the complaint against AT&T (Joskow, Noll 1999:1259). In the course of this process, the formulation of the "Bell Doctrine" became articulated. It provided another building block in the development of network access regulation in the

[73] Actually filed as US vs. Western Electric Co., because it modifies a settlement from 1956. It became known in legal circles as the "final judgement".

United States, alongside with the essential facilities doctrine which is also a product of US anti-trust law. The Bell Doctrine states that "regulated monopolies have the incentive and opportunity to monopolize related markets in which their monopolized service is an input, and that the most effective solution to this problem is to 'quarantine' the regulated monopoly segment of the industry by separating its ownership and control from the ownership and control of firms that operate in potentially competitive segments of the industry" (Joskow, Noll 1999:1250). One demand of the Doctrine is "to build an effective institutional firewall between the regulated monopoly and the other segments of a vertical chain" (Joskow, Noll 1999:1253), if costs of anticompetitive conduct outweigh loss of efficiency from vertical integration. The Doctrine delivered the rationale for a second settlement, the "modified final judgement" after another year of litigation. It constituted the "great U.S. experiment with vertical separation of network monopolists" (Vogelsang 2004:6). AT&T was compelled to divest its distribution network activities, the local "Bell Operating Companies" (Baby Bells), in order to prevent it from using their factual monopoly to control the competitive long-distance market. "Thus, the fundamental rationale for divestiture was not the belief that regulation, could not use behavioral restrictions, accounting and structural separation, price cap regulation, etc., to solve the problems. Rather, the move to divestiture reflected the belief that regulators would not be able to develop and implement these policies effectively." (Joskow, Noll 1999:1270). This consent decree came to be implemented by the attending judge at the Supreme Court who thereby took on a central role in the reconfiguration of sectoral governance besides the regulatory commissions. The vertical break-up of the industry and isolation of local networks was followed by the introduction of rules for interconnection and access charges for local network usage.

United Kingdom

While in the context of the US telecommunications sector liberalisation and the problem of competition was dealt with in an incremental fashion by pro-competitive policies of the regulatory commission and by the courts, it was the matter of broad design and systematic arrangements in the UK.

After it privatised British Petroleum and Amersham and Associated Ports in its first term, the Tory government moved to privatise British Telecom and British Gas in its second term. To do this, it had to find a solution as to how to make sure that the then private monopolies would not abuse their market power, but be incentivised to keep quality of service, increase efficiency and keep up with innovation and technological change.

Before state-owned companies were sold off, the British government commissioned studies on various design options for reconfiguring sectoral governance patterns. This went into the formation of an approach to liberalisation that was based on the establishment of a sectoral regulatory agency headed by a director with statutory powers independent of government, a newly designed price regulation mechanism (RPI-X) that would automatically induce efficiency improvement in the regulated industry[74] and licensing of companies to compete with the incumbent monopolist. It was expected that the regulation of prices could be light-handed and temporary as increased competition would make regulation superfluous. In case of disputes between regulator and companies the Monopolies and Mergers Commission was to adjudicate. This approach established a framework for the British liberalisation experiment. It provided a basic design which was taken up in various sectors and became revised and developed according to experiences with its performance (Pollitt 1999:10; Foster, 1993: 124).

In the telecommunications sector, this approach led to the privatisation of British Telecom as a vertically integrated utility and licensing of one new competitor (Mercury). This approach produced its specific problems. The main issue was a lack of actual competition in the telecommunications sector after formal liberalisation and excessive demands on regulatory capacity as a result of it. "At the time of privatisation, BT was a de facto monopoly supplier of basic telephone services. Even though a national competitor, Mercury Communications, had been licensed in 1982, it was unable to supply basic telephony until it had an interconnection agreement with BT, which was eventually determined by OFTEL in October 1985. At the time of privatisation, moreover, the government announced its intention not to license any further fixed-link competitors until 1990 at the earliest. Between 1985 and 1991, BT and Mercury enjoyed a duopoly in the market for fixed-link telephone services" (Holder, 2000: 55).

Specific issues linked to the lack of competitive pressure on British Telecom and excessive demand on the regulator were that price regulation was experienced to not work as automatically as promised. For establishing the various

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[74] Serra (Serra, 2000: 88) claims that price regulation was for the first time implemented in Chile: "The Chilean price-setting system attempts to correct the main problem of the rate-of-return approach, by explicitly separating prices from firms' actual costs. The legislation defines rate-setting schemes based on marginal-cost pricing in simulated efficient enterprises. The new legislation attempts to provide incentives to promote efficiency, by separating rates from firms' actual costs." (Pollitt 1999:10) claims that the particular RPI-X formula that includes a retail price index and efficiency improvement component is an invention by Stephen B. Littlechild who authored a report to the British government on design options for telecommunications regulation.

components of the formula costs and possible cost savings had again to be estimated and showed the information asymmetry between regulator and industry. Another issue was quality regulation. This first arose as in 1987 when was reported that 23% of BT payphones were not working. This was against the background that operating payphones was a statutory requirement for BT, but incurred economic loss to the company. The RPI-X formula thus became augmented with quality regulation: a fixed penalties for failure to meet service standards were made part of the license conditions.

In the gas sector, a similar approach was followed that was used in telecommunications. An independent regulatory agency became established, RPI-X applied and the market opened for licensed competitors. British Gas was privatised in 1986 as a vertically integrated producer, transporter and supplier of natural gas (Holder, 2000: 55). No competitor was created other than in telecommunications; however, on the other hand, licensing was not restricted to one other company but was in principle open to many suppliers to deliver gas to final users. The problem that arose with regard to this approach was that competitors had to use the pipelines owned by British Gas when they intended to take away its customers: "Although other suppliers had been able, in theory, to purchase and transmit gas for sale to final users through BG's pipelines since 1982, BG was still a monopoly supplier at the time of privatisation. (…) Notwithstanding the absence of actual competitors, this market was thought to be sufficiently competitive that it should be subject only to general competition law (rather than industry-specific economic regulation). (…) Within a year of privatisation, BG was referred to the Monopolies and Mergers Commission (MMC), following complaints of discriminatory behaviour in the contract market. The MMC found that BG was practising extensive discrimination, and that this was acting against the public interest by imposing high prices, deterring entry (…) BG was required to produce price schedules for all suppliers to large customers, to publish details of the terms and conditions of common carriage, and also to contract for no more than 90% of the gas from any new field." (Holder, 2000: 55-57)

New Zealand

A further example of experiments with liberalisation in the 1980s can be found in New Zealand. In a similar way to the USA and the UK, and in a slightly different way to Chile, the build-up of a strong agenda for regulatory reform linked to a new government coming into office created a protected space in which radical and uncertain innovations in governance could be tried out. Similar to the UK and Chile, New Zealand also experienced an economic crisis prior to

neo-liberal reform including privatisation and liberalisation and the promise to solve perceived problems brought a new government to the fore. And, as was the case in these other two countries, its constitutional settings (or non-constitutional settings respectively) gave the ruling government great powers to also pursue far-reaching restructuring programmes.

In the case of New Zealand, however, it becomes clearly visible how regulatory reform had by now developed into a global movement with a transnational community of policy analysts thinking and coordinating their activities in terms of principles of the principle of free markets and the quest for a workable design for liberalisation in the utilities. Alan Bollard, chair of the Commerce Commission said the following at the time of the reforms with regard to the roots of the reform agenda (1997): "Official thinking was influenced by the intellectual developments internationally, including the advice emanating from international organizations such as the World Bank, the International Monetary Fund and the OECD, and by dissatisfaction with the domestic experience with activist demand management and detailed regulation of economic activity more generally."

What also becomes visible in connection with the reform process in New Zealand is that something like a global competition has set in for developing best approaches to liberalisation and solving the problem of competition in the utilities. This problem became recognised as a block to a real take-off of neo-liberal reform, also beyond a select group of countries with committed and powerful governments that were ready to experiment. This was visible, for example, in the way in which the OECD acclaimed the reform programme in New Zealand as "the most comprehensive liberalisation programme" as well as the way in which praise was proudly displayed by government officials responsible for the reform (S. Jennings and R. Cameron, "State-Owned Enterprise Reform in New Zealand", in: A. Bollard and R. Buckle, 1987). Another indication is the way in which the New Zealand reform programme is explicated and presented as a conceptual innovation and featured for a world public from the very beginning. I will come back to this emerging global dynamic of regulatory reform at the end of the presentation of this phase of the innovation journey.

The reform programme in New Zealand started in 1986 with an Act on state owned enterprises which laid down that all special regulations beyond general competition law were to be abandoned. What was special about the approach to regulatory reform with which the government of New Zealand started off was that it did not intend to privatise state-owned enterprises in the sense of selling them off to private investors, but rather to "corporatise" them. This included a transformation into companies with commercial objectives that had to obey market rules just like any other private company. In addition, their monopoly rights were abolished and they had to compete with other companies.

At the same time, they were kept in public ownership and directed at arms length so as to assure a level playing field between state-owned enterprises and other ones.

A somewhat curious reconfiguration of governance was undertaken from 1987 to 1990 in the electricity sector. Following the Chilean example and the "Bell Doctrine" from US telecommunications, the electricity industry became vertically separated so that electricity transmission became a separate service that was provided to competing companies in other market segments on the same conditions. Furthermore, a power exchange was established on a non-mandatory basis to match supply and demand on the basis of a merit order of bids (OECD, IEA, 2001: 35). In order to introduce competition, however, apart from eliminating all statutory monopoly rights and abolishing entry barriers for private companies, a second state-owned enterprise was created to compete with the incumbent. In telecommunications, the government allowed for entry at all levels in the same three year period from 1987 to 1990. (Nestor, Mahboobi, 2000: 35-36). This was promised so as to allow for "light handed regulation" (Duncan, Bollard, 1992).

Samenvatting (Summary in Dutch)

Dit proefschrift analyseert de ontwikkeling van beleidsinstrumenten als "designs on governance". Deze laatste formulering blijkt onvertaalbaar: ze verwijst naar het ontwerp van instrumenten ten behoeve van 'governance', maar tegelijkertijd ook naar bedoelde en onbedoelde effecten van beleidsinstrumenten, met een eigen ontwikkelingsdynamiek, op 'governance'. Deze twee kanten van de ontwikkeling van beleidsinstrumenten, inclusief toepassing tot en met het opspannen van een nieuw regime, bijvoorbeeld van koolstof-emissie markten, vormen het onderwerp van twee gedetailleerde case studies, beide van economisch georiënteerde instrumenten: emissie-handel en regulering van toegang tot netwerk-infrastructuur in de utiliteitssector.

Dit "dubbel-leven" van beleidsinstrumenten roept de vraag op hoe 'governance' en de instrumentering van 'governance' opgevat moeten worden. Er is in elk geval een paradoxale situatie. Enerzijds is er kritiek op het idee van beleidsinstrumenten als gereedschap dat onproblematisch ingezet kan worden om beleidsdoelen te bereiken. De werkelijkheid is complexer, en de technische probleem-oplos retoriek kan gemakkelijk het essentieel politieke karakter van (publiek) beleid verhullen. Anderzijds lijken politieke actie zowel als publiek debat zich te concentreren op de instrumentele vragen hoe iets voor elkaar te krijgen, en niet op de grote vragen naar kaders, doelen en alternatieven.

De paradoxale situatie zelf is een gegeven. Dit proefschrift wil een alternatieve ingang ontwikkelen, waarin beleidsinstrumenten zowel gereedschappen zijn, als (en mede daardoor) onderdeel van politiek-geladen dynamiek van het herconfigureren van 'governance' in de complexe wereld. Deze visie is verder te funderen door 'governance' zelf te zien als combinatie van ontwerp (van sturing, en van verandering in het algemeen) en van feitelijk optredende dynamieken waarvan sturingseffecten uitgaan. Het is de verknoping van beide welke beter begrepen moet worden, in het algemeen en om de rol van beleidsinstrumenten te kunnen zien voor wat het is.

In de literatuur worden de ontwerp & sturing benadering en het volgen van feitelijke dynamieken met ad-hoc aanpassingen, als contrasterende benaderingen gezien. In plaats daarvan kan (in Hoofdstuk 2) een overall perspectief ontwikkeld worden waarin beide passen. Geïnspireerd door Giddens' notie van 'structuration', worden drie gradaties van struturatie onderscheiden. Een gradatie waarin nog niet veel gearticuleerd is, waarin structuren nog open (of onzichtbaar) zijn en wederzijdse aanpassing voorop staat. Een gradatie waarin toenemende stabilisering, articulatie van categorieën, en het volgen van rollen optreedt. En een derde gradatie, waarin op categorieën en rollen gereflecteerd wordt en gericht naar verandering wordt toegewerkt. In de derde gradatie staat een ontwerp-perspectief voorop, maar nu wel ingebed in

de complexe wereld van de eerste en tweede gradaties. Dit betekent o.a. dat het ontwerp & sturingsperspectief als een illusie geplaatst wordt – omdat de feitelijke ontwikkeling een eigen dynamiek heeft – , maar wel als een produktieve illusie omdat het zaken in beweging zet.

In Hoofdstuk 3 wordt de literatuur over beleidsinstrumenten gekarakteriseerd als verdeeld in enerzijds het openen van de 'black box' van eerdere visies op, en toepassing van, beleidsinstrumenten als gereedschap, en anderzijds het doorgaand investeren in verdere ontwikkeling van zulke gereedschappen. Bij het openen van de 'black box' gaat het echter om meer dan het tonen van complexiteit. Er zijn patronen in de zich ontwikkelende configuraties, mede omdat voortdurend de vraag naar instrumentaliteit speelt. En bij het ontwikkelen van gereedschappen speelt ook een model van gewenste 'governance'. Dat is heel duidelijk in de bijdrage van zowel emissie-handel als netwerk-toegang regulering aan economische liberalisering and het doel van grotere marktwerking. Het is de combinatie van configurationele dynamiek en model-gekoppeld ontwerp die het dubbel-leven van beleidsinstrumenten bepaalt. De volgende stap is dan de herkenning dat beleidsinstrumenten zich ontwikkelen in de tijd en over verschillende domeinen van applicatie heen. Deze dynamiek is minstens zo belangrijk als het verbeteren van de prestaties van het instrument op zich.

Voor verder inzicht is het dus nodig het leven van beleidsinstrumenten te kunnen volgen. De beleidstudies literatuur heeft op dit punt niet veel te bieden, maar gegeven dat beleidsinstrumenten altijd ook een gereedschapskarakter hebben moeten recente brede innovatie-studies, vaak gebruikmakend van wetenschap- en technologie-studies, iets te bieden hebben. Dat is wat Hoofdstuk 4 laat zien. Het begrip 'innovation journey' wordt overgenomen (als heuristiek) om het pad dat al doende gecreëerd wordt te karakteriseren en fases daarin te onderscheiden, bepaald door transities naar een ander (volgend) patroon. Fases lopen van variatie en ad-hoc ontwikkeling, naar 'proof of principle' en beschermde ruimtes voor gerichte ontwikkeling, dan prototypen en bredere acceptatie van de belofte, en vorming van een nieuw regime, waarin modellen van 'governance' en technieken van 'governance' samenwerken. Er speelt uiteraard meer, bijvoorbeeld overall verschuivingen in visies op governance (de liberaliseringsbeweging vanaf de jaren tachtig is een duidelijk voorbeeld). Het model van 'innovation journey' moet daarom geplaats worden als één van de stromen in een meer-stromen model ontleend aan Kingdon, naast een 'governance'/politiek stroom. Op basis hiervan kunnen theoretisch verschillende ontwikkelingspatronen onderscheiden worden, met name (en opnieuw onder verwijzing naar innovatiestudies) een 'design push' en een 'dynamics [of governance] pull' patroon.

Hiermee is een uitgangspunt voor empirische studies geschetst. In Hoofdstuk 5 wordt in detail ingegaan op de methodologie van reconstructie van 'innovation journeys'. Vervolgens wordt de selectie van case studies toegelicht. Het idee achter de keuze van emissie-handel en netwerk-toegang regulering als cases (en gebaseerd op een eerste exploratie van een aantal mogelijke cases) was om voorbeelden te hebben aan beide uiteinden van het continuum van 'design push' naar 'dynamics pull'. In de twee volgende empirische hoofdstukken blijkt dat het inderdaad interessante voorbeelden zijn (al zijn het geen extremen).

In hoofdstuk 6 wordt de 'innovation journey' van emissie-handel gereconstrueerd. Onafhankelijk van elkaar ziet men in de jaren zeventig in de Verenigde Staten zowel experimenten van de Environmental Protection Agency met flexibele regulering van vervuilende emissies, als economische modellen voor markt-gebaseerde alternatieven voor 'command & control' regulering. Circa 1980 wordt binnen de Environmental Protection Agency ruimte gecreëerd om experimenten en modellen te combineren tot een 'proof of principle' voor een nieuw instrument. Hoewel beperkt vanwege de context waarin het ontwikkeld was, is de belofte voldoende om in de Verenigde Staten prototypes van het instrument in te zetten voor verschillende emissie-reductie programma's. In de jaren negentig word geleerd uit de experimenten, en nieuwe toepassingen gecreëerd: ter ondersteuning van de onderhandelingen over reductie van uitstoot van broeikasgassen (het Kyoto Protocol) en vervolgens binnen grote ondernemingen als BP en Shell. De politiek "stroom" speelde een grote rol bij acceptatie van koolstof-emissie handel als een instrument, in het terugtrekken van de Verenigde Staten en vervolgens in het oppakken van het instrument emissie-handel door de Europese Unie. Inmiddels waren uitgebreide netwerken van beleidsinstanties, gespecialiseerde consultancies, banken en (economische) wetenschappers ontstaan – men spreekt nu van de 'carbon industry' – welke een eigen dynamiek introduceerden. Het netto effect is het ontstaan en de stabilisering van een regime van emissie-handel als een specifieke instrumentering van nieuwe vormen van 'governance'.

De reconstructie van de 'innovation journey' van netwerk-toegang regulering in Hoofdstuk 7 laat een ander patroon zien, juist ook omdat algemene 'governance' kwesties al vroeg een rol spelen onafhankelijk van een specifiek instrument. Het is daarom ook moeilijker om aan te geven waar c.q. hoe de 'innovation journey' begint. Achteraf gezien zijn precursors aan te geven, met name anti-kartel wetgeving en actie in de Verenigde Staten rond 1900, en juridische uitspraken over natuurlijk monopolie en toegang tot infrastructuur (de 'essential facilities doctrine'). Na de Tweede Oorlog speelt de inzet van de economen van de Chicago School om een markt-alternatief te ontwikkelen voor overheidsverantwordelijkheden, met name in de utiliteitssector. Deregulering

werd een reële optie, en dit leidde in de jaren zeventig tot eerste experimenten in de Verenigde Staten en in Chili (waar de "Chicago Boys" als adviseurs hun gang mochten gaan onder het Pinochet regime). Het doorzetten van deregulering bleek in de praktijk op allerlei problemen rond governance van gedeelde infrastructuur te stuiten ('reverse salients'), waaraan aanvankelijk ad-hoc gewerkt werd. In de omvangrijke campagne voor privatisering in het Verenigd Koninkrijk van Thatcher werd ook naar een model gezocht waarin beheer van onderhoud van de infrastructuur (een natuurlijk monopolie) gescheiden werd van het leveren van diensten op deze infrastructuur door marktpartijen. Om markt-competitie van deze diensten mogelijk te maken was re-regulatie van de infrastrucuur nodig: netwerk-toegang regulatie. De belofte van dit model gekoppeld aan actief pushen door Wereldbank/IMF, OECD en de Europese Unie, leidde in veel landen tot een hausse in liberalisering in de utiliteitssector in de jaren negentig. Bij de implementatie in specifieke politieke en economische (en culturele) contexten bleek het model echter steeds aangepast te moeten worden. Er traden soms ook problemen o.a. in treinverkeer en electriciteitsvoorzieing. Wat een regime leek te zijn met een algemeen geldige aanpak was niet in staat om voortgaande reconfiguratieprocessen goed aan te sturen. In tegenstelling tot de situatie bij emissie-handel was de internationale instrument-ontwerp en –onderhoud gemeenschap niet sterk geïntegreerd.

In het concluderende hoofdstuk 8 wordt eerst ingegaan op de aanpak die ontwikkeld was in Hoofdstukken 4 en 5, en toegepast in Hoofdstukken 6 en 7. Hoewel enkele aanpassingen nodig waren, bleek de aanpak goed te werken en nieuwe inzichten in de dynamiek van de cases op te leveren. De vraag is of de aanpak bij minder uitgesproken instrumenten dan economische ook werkt. Voor enkele voorbeelden wordt aangetoond dat er nog steeds sprake zal zijn van een dualiteit van model en configuratie dynamiek, zij het dat de instrumenten een minder uitgesproken eigen dynamiek hebben.

Enkele verdere bevindingen zijn nu al interessant maar verdienen verder uitgewerkt te worden. Het gaat dan met name om de verdeling van ontwerp-werk tussen het ontwikkelen van algemene modellen en het locatie-specifiek uitwerken. Het eerste wordt gedragen door een netwerk van onderzoekers, consultants, beleidsmakers, commentatoren, het tweede is onderdeel van voortgaande reconfiguratie processen. Een tweede cluster van bevindingen gaat over de combinatie van het politiek-open, technische karakter van instrumenten (en de discourse van instrumenten) welke bondgenootschappen mogelijk maakt, en de governance modellen die in instrumenten ingeschreven zijn.

Het hoofdstuk wordt afgesloten met enkele beschouwingen over de ambivalenties van technische rationaliteit en de mogelijkheden van open, lerende 'governance'.