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The Role of Institutional Innovations in the Transition to Low-Carbon Futures

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Abstract

Deep cuts in carbon emissions to avoid dangerous climatic change will require fundamental transformations of the energy and transport systems. This is an enormous challenge for society and the political system. In order to tackle this challenge, we argue that it will be necessary to develop new institutions and institutional practices that address and give priority to long-term climate policy objectives. In this paper we focus on three institutional innovations in the field of climate governance and energy system transformations that are guided by such visions. Institutional reforms at the national level in three arguably progressive cases (the Netherlands, the UK and Sweden) are studied concerning their relevance for governing transitions towards low-carbon societies. The study asks: What views on how to bring about low-carbon transitions guide the activities of the institution? What is the role of new institutions in processes of change and what institutional practices have developed so far? The cases provide examples of ways to enhance reflexivity and how a new political agenda for low-carbon futures and strategies for instigating processes of change can be institutionalized. However, when contrasted against contemporary green political thought, they seem to be bound by liberal conceptions of greening the welfare state rather than post-liberal ecologist ideals on radical green transformations. Our analysis also shows that in practice, the institutions examined tend to favor technological transitions over behavioral change and to be reliant on hierarchical authority and traditional patterns of steering to a greater extent than intended.

1 Introduction

A central objective of climate change mitigation policy, at least in most industrialized countries, is to achieve deep cuts in greenhouse gas emissions over the coming decades to guarantee climate stability over the long-term. To avoid dangerous climatic changes, emission levels have to peak in the next decades and approach close to zero over the course of this century (IPCC 2008). The implied transition towards low- or zero-carbon futures requires fundamental and large-scale transformations of key societal sectors such as the energy and transport systems. That will amount to a significant challenge for society and the political system in terms of introducing and implementing effective abatement policies and measures. To tackle this challenge it will also be necessary to develop new institutions and institutional practices that manage to address the long-term climate policy objectives and to put them on equal footing with other core political priorities such as economic growth, job creation and welfare protection. Thus, the new political agenda for low-carbon futures will hardly materialize unless the present institutional frameworks are reformed to make sure that they provide the necessary conditions for instigating the required transitions and sufficient institutional stability for such long-term processes of transformative change. At the same time, considering prevailing relations of power that might be affected, new institutions need to be legitimate and capable of handling potential conflicts of interest.

The purpose of this paper is to study the role of emerging institutional innovations in the field of climate governance and energy transformations. Focusing on governance at the national level, we study three case studies of novel and arguably progressive institutional reforms during the recent decade. The cases are the Transition Approach in the Netherlands, the Climate Change Act in the UK and the Environmental Quality Objectives reform in Sweden. These countries are at the forefront of climate governance, and the cases all represent examples of contemporary efforts to strengthen the priority of sustainability and climate change concerns and to institutionalize new policy approaches for addressing such long-term challenges. The case studies are based on written documentation consisting of publicly available reports from the studied institutions as well as scientific evaluations of their functioning.

An overarching research question is how adequate such innovations are for governing transitions towards low-carbon societies, and what potential new institutions might hold for instigating required processes of change. To answer this, the three cases are assessed with the help of more specific questions regarding (i) the view on how low-carbon transitions are to be brought about; (ii) the role and authority of new institutions in governing such processes of change; and (iii) the actual institutional practices that have developed so far. The cases are further analyzed subject to how they relate to contemporary green political thought. In particular, the cases are contrasted with the two main strands of *green liberalism* and

post-liberal ecologism. The first of these is often reflected, at least by implication, by the environmental pragmatism found in mainstream policy debates and rhetoric about 'greening the welfare state', while the second endorses more radical and fundamental societal change and green transformations.

2 Low-carbon futures, institutional innovations and green political thought

A large number of scenario studies, both national and global, have shown that it is technically possible and economically viable to develop low-carbon energy and transport systems to meet challenging climate policy objectives (see e.g. IEA 2008; Krewitt et al. 2007; European Commission 2006; Pacala and Socolow 2005). Such scenarios help envisioning low-carbon futures and alternative pathways for bringing about the transition towards such ends. Taken together low-carbon scenarios identify four main types of technical solutions: renewable energy, energy efficiency, nuclear energy and carbon capture and storage (CCS). The scenarios emphasize different technologies and in some cases restrictions are put on certain technologies and pathways. Most scenarios do not include changes in behavior as a way to reduce emissions but in some studies this is a central strategy, e.g. in the form of reduced transportation or less meat consumption (e.g. Åkerman et al. 2007). What comes out of all scenario studies is that large-scale and far-reaching transformations are needed for a low-carbon future to be realized. This is the case both in terms of technological development and changes in lifestyles and behavior. While low-carbon transitions seem technically possible they will not come about autonomously since market actors and civil society often lack the foresight and incentives for collective action and change. Instead there is a need for purposeful societal steering and government interventions at various levels. However, governments are today struggling with implementing even modest climate change policy goals (e.g. Kyoto targets) and there is little evidence that current institutions hold the capacity to instigate the kind of radical change needed.

2.1 The need for institutional innovations

The role of institutions and the conditions for institutional change and institutionalization are classical themes in political analysis. Institutions, formal as well as informal, constitute social contexts and provide for continuity and stability in society by setting the "rules of the game" (North 1990) and by constraining and guiding human behavior and interaction (March and Olsen 1989). In the literature, institutions are defined in several different ways largely depending on the institutional perspective of the researcher (for instance, rational, historical or sociological 'new' institutionalism). Institutions can be defined as systems of rights, rules, and decision-making procedures (Young et al. 2008) that could be manifested either in formal or informal (norms, values, codes of conduct, etc) terms. A key feature of institutions is that they "by definition are the more enduring features of social life" (Giddens 1984, 24). Political institutions are

subject to path dependencies due to increasing returns and positive feedbacks and are thus change-resistant (Pierson 2000a). Despite this, institutions can change, intentionally or by accident either at critical conjunctures or in sequences unfolding over time (Pierson 2000b). In this paper we are concerned with the role of institutions for social and policy change and, in particular, for institutionalizing a responsive and long-term policy response to the climate change challenge. When it comes to climate change mitigation, the debate has been rather narrowly oriented towards appropriate policies and measures to reduce greenhouse gas emissions and, in particular, how to abate emissions at lowest possible cost. But the need to adjust and reform the institutional frameworks and to institutionalize a priority to long-term climate policy concerns, has not received the same level of attention. An exception may be the debate around new global climate policy regimes and the emerging carbon market institutions. It seems difficult to tackle the climate change challenge and instigate the large-scale technological and behavioral transformations implied without changing the institutions that lock us into the carbon economy and creating new institutions designed to lock us into low-carbon development pathways.

In this paper we study institutional innovations in climate change governance hoping that they provide important insights on what types of institutional reforms that are required to handle the uncertainty, complexity, temporal, multi-level and multi-actor context of climate politics. In this, we are mainly concerned with the formal features of the institutions that we study. We do not wish to neglect informal aspects that affect the institutional practices and contribute to uphold their legitimacy as political institutions. As we will see in more or less all of our cases, formal and organizational features of institutions are based on norms of various kinds. That said, institutional innovations are formally embodied in different ways, either by new regulations, policy approaches, strategies and decision practices or by the establishment of new organizations. It is shown in the cases how new institutions can be formed and constituted both by formal regulations and delegation mandates such as in the British and Swedish cases and by institutionalization of norms and conceptions associated with new policy discourses (see e.g. Hajer 1995) as in the Dutch transition approach.

In this paper we specifically emphasize three questions that we think have particular relevance for assessing the potential of institutional innovations to contribute to low-carbon transformations. First we ask: *what views on how to bring about transitions to a low-carbon society underpin the institutional innovations?* One aspect of this question is to determine whether the aim of the institution is ambitious enough and whether its mission is a large-scale transition to a low-carbon society or if it is formulated in more vague and ambiguous ways. Another aspect concerns the underlying ideas on how societal change is brought about and which actors in society should be the drivers of change.

Second we are interested in *the intended role and authority of the new institutions in instigating and governing processes of change*, as expressed in its formal mandate and design. What is the institution supposed to do and what is its relation to different actors and stakeholders? Does it have the authority to carry out its intended role? For its operation the institution needs a certain degree of power and authority and a key issue is what type of authority the institution has to influence change in terms of both formal (legal and political) authority delegated and other sources of authority and legitimacy. Can it create and enforce rules and regulations or has it more of an advisory function? An important question regards the degree of independence the institution has, especially in relation to the government, but also to other actors and political levels.

Third, and finally, we ask *what actual institutional practices have developed so far?* For novel and ongoing institutional innovations as those studied it might be to early to evaluate the actual performance in terms of effective outputs. Rather we are concerned with how the institution has been institutionalized in practice and whether the operations and activities of the institution have developed in the intended direction. A key issue is whether the institutional innovation includes new governance forms and rationalities or if they rely mainly on traditional state-led governance. In the environmental governance literature, there has been a persistent critique of traditional governance forms based on hierarchical steering and administrative expert rationality, which are said to be both ineffective and lacking democratic legitimacy (see e.g. Bäckstrand et al. 2010). More generally, we are interested in how the institutional innovations relate to contemporary ideas about how to bring about long-term transformations such as in green political thought discussed in the next section.

2.2 Green political thought and low-carbon futures

While an examination of the formal features of institutional innovations tells us about their strengths and weaknesses in instigating change it is not enough to fully understand their role in a transition to a low-carbon future. Therefore, we also turn to green political thought because it has something important to say about what kind of transformations the institutions will favor. A central issue in contemporary green political thought is about which political system (including norms and values) is best suited to achieve and uphold a sustainable society. While there is great diversity in green political thought, one can distinguish between two broad approaches for addressing the climate and sustainability challenge. For instance, Andrew Dobson (2007) argues that there are two dominant but very different approaches in the European debate; environmentalism and ecologism. Similarly, Bailey and Wilson (2009) claim that in

current debates about low-carbon transitions, there is a clear dominance of green liberal perspectives that favor technological development, while ecocentric perspectives are fairly marginalized.

Green liberalism (see e.g. Wissenburg 1998; Jagers 2002) is a perspective that maintains that far-reaching environmental protection can be achieved within the present liberal capitalist global order, even though it might require substantial changes in preferences and policy reforms. The other perspective is *post-liberal ecologism*that starts out from the assumption that human societies have to respect the ecological constraints that are set up by nature. This perspective is skeptical about the possibilities to green liberal capitalism since it is based on economic growth, increasing material consumption and capital accumulation as the overriding societal objective (rather than a means to other objectives). In particular, the liberal dogmas are seen as highly problematic as they tend to favor individual neutrality and freedom over common goods such as ecological sustainability (Eckersley 2004). While a common goal for the two perspectives is sustainability and, in relation to climate change, a low-carbon future, they give very differing accounts of how to build a sustainable society and how sustainable futures are to be attained. In this article we do not attempt to make any judgment on which perspective is most appropriate or relevant. Instead we use the two perspectives as ideal models against which contemporary efforts to put society on a path towards a low-carbon and sustainable future could be contrasted and assessed.

Within *green liberalism* there is a strong belief in technological solutions to the climate challenge and a view that a low-carbon society is compatible with the present economic and political system. There is likewise a faith in the capabilities of the market to solve environmental problems, although substantial government interventions might be required. For instance, policy instruments that reflect the true value of environmental costs can incentivize market actors to become more responsive to ecological concerns and made responsible to develop and adopt less harmful technologies and behavior. Political authority is seen as central for change and market and civil actors are often invited to participate and engage in various activities. This participation is controlled from top-down and in the ‘shadow of the state’. Thus, there is strong reliance on administrative and expert rationality and also on economic rationality. *Post-liberal ecologism*, on the other hand, centers on the need to adopt a more ecocentric world-view were the economic system has to adapt to the limits set by ecosystems. Formal political authority is not necessarily the main source of authority and there is broad skepticism towards both the state and market actors’ capacity to act toward sustainability and climate goals. Behavioral changes are considered crucial in the transition. The civil society and citizens are viewed as the main drivers of change in developing and nurturing more ecocentric paths for sustainability and low-carbon transitions. Deliberative rationality and network forms of governance are seen as important as a way to strengthen ecological responsiveness. In

turn, this will foster a culture of reflexivity that takes long-term goals and ecological justice concerns into account. Eckersley (2004) for instance, sees state institutions as key in this process but concludes that liberal democracies have to be revitalized through fundamental reforms of state institutions and the establishment of 'ecological discursive designs' in the institutional framework.

3 Institutional innovations for a transition to low-carbon futures

Governments around the world are introducing new institutional practices to deal with the challenge of climate change and the transition to low-carbon energy and transport systems. In this chapter we analyze three examples of such institutional innovations in the UK, the Netherlands and Sweden. The cases have been selected because they are novel and progressive and the countries where they have been developed are at the forefront of climate change governance. Two of these countries (the Netherlands and Sweden) are often viewed as pioneering states (e.g. Jordan and Liefferink 2004) in environmental policy and the implementation of sustainable development in general. The former Labour government in the UK under Gordon Brown succeeded to achieve momentum for advancing the domestic climate change policy in ways largely unique to comparable cases. The institutional innovations are analyzed based on the three questions discussed in the previous section, including a discussion of how they relate to the main lines of thought in contemporary green political thinking.

3.1 Introduction to the cases

The Netherlands: The Transition Approach1

The Transition Approach is an institutional innovation of Dutch environmental and sustainability politics relevant for such diverse fields as energy, mobility, health, regional development and agriculture. It is based on a broad recognition that the changes needed to achieve sustainability goals will require large transitions in society. It was initiated as a government policy in the fourth environmental policy plan from 2000 (Kemp and Rotmans 2009). The work on energy transitions begun shortly thereafter. Six platforms have been developed: sustainable mobility, new gas and clean fossil fuels, green raw materials, chain efficiency, sustainable electricity supply and the energy in the built environment platforms (Energy Transition Task Force 2006: 23-33; Foxon et al. 2009:5). These platforms (or transition arenas) are made up of a selected set of participants, innovators and forerunners who are responsible for generating the visions and then determine the pathways that will be taken and which niche experiments will be supported and developed. The innovative element of the transition approach is that it is based on insights and

[1] The Dutch case study is based mainly on the work of: Grin et al. 2010, Kemp & Rotmans 2009; Kemp et al. 2007; Kern & Howlett 2009; Loorbach & Rotmans 2010; Smith & Stirling 2008; Smith & Kern 2009; Smith et al. 2005; Voß et al. 2009.

theories from various academic disciplines. Transition theory presents a range of theoretically derived models that inform the transition process. A central idea is that if innovation processes are nurtured in a limited area or niche, this will instigate bottom-up innovation processes with a potential to generate larger socio-technical system change. Researchers have a more prominent role than simply advising policy makers, they are actively involved in the transition that is perceived as reflexive and continuously evolving through learning.

The UK: The Climate Change Act and the Committee on Climate Change2

The Climate Change Act adopted in November 2008 represents a significant advance in climate governance in the UK (Climate Change Act 2008). The Act includes three main institutional reforms. First, the Act sets up legally binding emission targets stating that by 2050 the net UK net carbon account should be 80% below the net UK emission level in 1990. Second, the Act introduces a system of carbon budgets for the UK which constrains the total amount of emissions in a given time level. Each carbon budget period lasts five years and the first period is from 2008-2012. Third, a new independent organization has been created – the Committee on Climate Change (CCC) – which has as its task to advise the government on issues such as long-term climate goals, how to reduce emissions, the optimum trajectory to 2050, the level of carbon budgets and how much effort different parts of the economy should do. The CCC also monitors and reports the progress of emission reductions. The most interesting innovative feature of the UK case lies in its attempt to institutionalize an ambitious and long-term government policy on climate change. All three elements of the reform – the legally binding target, the carbon budgets and the Committee on Climate Change – aim at putting pressure on government to stay on track towards a low-carbon society.

Sweden: The Environmental Objectives Council and the EET strategy3

In the late 1990s Sweden introduced a number of environmental policy reforms intended to change the national strategy for addressing ecological sustainability as an overarching concern of environmental governance. The cornerstone of this strategy was the introduction of a new set of environmental quality objectives (EQOs). ThisEQO reform contributed to institutionalize a new administrative management-by-objective strategy for steering environmental governance with repercussions for the organization of environmental policy in Sweden during the last decade (Lundqvist 2004). The reform imposed a new

[2] The UK case is based on mainly official documents such as legal acts and reports from the Climate Change Committee. Due to the newness of the institution there is still a very limited amount of evidence from the case in the form of scientific studies or evaluations.

[3] The Swedish case study is based on mainly official documents such as government bills and assessment reports (e.g. EPA 2007; EOC 2008; SOU 2009:83) as well as work of e.g. Lundquist 2004; Nilsson and Persson 2003; Hildingsson 2010.

hierarchy of sustainability objectives resembled around an overarching generational objective: “to let the next generation inherit a society where the major environmental problems in Sweden are resolved” (Bill 1998/99:145) followed by 16 national environmental quality objectives including the ‘Limited Climate Change’ objective to avoid dangerous climatic impacts. A crucial innovation was the nature of these long-term objectives expressed as the desirable quality to be achieved in the physical environment formulated in generic and easily accessible terms such as ‘Clean Air’. Yet, the objectives were informed by resilience arguments and interpretations of scientific knowledge about critical loads and have been further operationalized in mid-term targets for 2010. Another novelty of this strategy was the introduction of the Environmental Objectives Council (EOC). The Council was given the task to coordinate and facilitate collaboration in the implementation of the EQO strategy, and a set of cross-sectoral implementation strategies (Bill 2000/01:130) such as the Energy Efficiency and Transport (EET) strategy.

3.2 What are the views on how low-carbon transitions happen and can be brought about?

In all three cases the institutional reforms have been guided by the recognition that long-term and large-scale transformations are needed in order to reach a sustainable and low-carbon future. Thus, a common objective of the institutions is that they, in some way, should contribute to such transitions taking place. However, we can see interesting differences in the underlying assumptions on how transitions happen and how they can be brought about. The Dutch case stands out in this respect. The reforms have been guided by an elaborated theory on transitions, based on research in for example, economic history, technological innovation, systems theory and sociology. The entire process has been research driven with close interaction between researchers, policy makers and other actors. A crucial assumption of the transition approach is that it is possible to manage transformations and guide change in a specific way. However, change can only come from the bottom-up in specific ways as suggested by models developed by researchers involved. The role of government is to enable, facilitate and provide political support and resources for transition processes, not to regulate or steer the transition process. Most activities relating to policy and change are thus expected to take place outside governments and administrations. There are two key aspects of the transition approach. One is the belief in the possibility of niches to come up with the innovations that drive the transformation forward. The other is the importance of value change and value re-framing, which is emphasized by the focus on and the establishment of common understandings of the problem at hand, of visioning and opening up for various, even ‘radical’ views in this process. This is related to another central idea of the transition approach, that through continued reflection and learning the process also evolves over time (Grin et al. 2010). An important institutional element of the Dutch case are the transition platforms or arenas, which can be described as public-private partnerships consisting of researchers, policy makers, forerunners, innovators, niche-players and those who think outside the box.

The aim of these platforms is to generate new innovations and ideas in niche areas that can grow and later challenge incumbent technologies and regimes.

Compared to the Dutch case there is no corresponding theory of transitions behind the UK and Swedish institutional innovations. Instead, both reforms have been more concerned about increasing the priority on climate change within government institutions and improving state governance. The implicit transition theory can in both cases be described as traditional government combined with a reliance on market-based policy instruments. There is thus a clear top-down view on the policy process and the relationship between the state and other actors. The most important task is, in this view, to establish and maintain an ambitious government policy for climate change, manifested in the adoption of a new, far-reaching and comprehensive policy framework (Committee on Climate Change 2008, 2010a). This will in turn send signals and give incentives to market actors and households to change behavior and to adopt and develop new technologies. In both the Swedish and UK cases there is recognition that market actors are essential in the transition process. Many individual policy instruments aim to initiate such processes, for instance by changing the economic incentives for investments in e.g. renewable energy and biofuels and for promoting energy efficiency. However, it is not a core aim of the institutional reform to engage with other stakeholders. In Sweden, the engagement with stakeholders has rather been aimed at building acceptance for the long-term strategy. By obtaining legitimacy for specific policies and measures the government hoped to assure implementation among key societal interests (Lundqvist2004).

When contrasted with the two perspectives in green political thought we can see that all three cases start out from an assumption that human society has to adapt to ecological limits set up by the climate change challenge. Emissions have to be cut drastically and reach near zero in the long run to avoid major disruptions in the world's ecosystems. Such a radical position, where environmental goals serve as the foundation and limitation of political and economic decisions, suggests that the three cases resemble the post-liberal ecologist perspective. However, the institutions do not explicitly address the question as to whether radical climate goals are compatible with the present global economic system. Rather it is implicitly believed that emission reductions are possible to achieve within the present system without questioning core elements such as economic growth, free trade and high consumption levels. In this the institutions are more in line with green liberalism. In the views on how to achieve change the UK and Swedish cases are closely related to green liberalism with a strong and active state and a belief in market solutions as the main way to tackle the climate challenge. The Dutch case is more ambivalent since it highlights the importance of deliberation and reflection and finds the main drivers of change outside the

state. However, the main aim of the Dutch approach is to foster innovation and technological development rather than changes in ideas and values.

3.3 What is the intended role of the institution and what authority does it have?

As stated above, the main aim of the institutional reform in the UK was to institutionalize an ambitious government policy on climate chance. The legally binding target of an 80% reduction in 2050 strengthens the long-term political commitment, while the more detailed carbon budgets are aimed at securing that today's policies and measures are consistent with the long-term goal. The third element of the reform was to create an independent body, which has as its core task to support and advocate an ambitious climate policy in line with the long-term goal. The legal authority given to the Climate Change Committee (CCC) is to provide advice to the government on carbon budgets, targets and policies and to monitor progress in reducing emissions and achieving the carbon budgets (Climate Change Act 2008). The CCC does not have any formal powers to decide on climate policies or prevent decisions that go in the wrong direction. Its authority and legitimacy instead comes from its function as an expert-driven independent body. Independence is a crucial factor and it is vital to its legitimacy that it is not perceived merely as a government tool or as being to close to specific interest groups. Expertise is another important source of legitimacy for the CCC since its influence mainly comes from the adviceit gives. The committee consists of nine members, which are all experts in the climate field, coming from academia, the public sector, NGOs and business (Committee on Climate Change 2009).

Also the Swedish case is an example of a reform designed to reinforce government institutions and ambitions on sustainability and climate change. The environmental quality objectives, e.g. on Limited Climate Change, is in this respect similar to the long-term reduction target in the UK Climate Change Act, even though they have not been put into legislation.[4] However, the innovative aspects of the Swedish case have been the delegation of 'sector responsibilities' to national authorities and agencies and to increase cross-sectoral cooperation through the creation of a new institution made up by their Director Generals. The 'sector responsibility' implies that national agencies were given a certain amount of administrative authority to adopt and implement specific targets and strategies of measures for the sector within their jurisdiction. The lack of sector integration has been a main concern since the 1980s but previous attempts have not become operational (Nilsson and Persson 2003). The EQO reform provided a way for institutionalizing sector responsibility. The Swedish EPA was given the chief responsibility for

[4] The politically agreed EQOs have indirect legal standing by guiding judgments made about the objectives of the Environmental Code, at least according to the legislators' intention (see e.g. Hildingsson 2010). For instance, that includes statutory powers to enforce industries to invest in energy efficiency measures and renewable energy.

the climate change objective and for implementing appropriate climate policy measures in cooperation with other authorities such as the Swedish Energy Agency, for instance through the EET strategy aimed at promoting energy efficiency in the energy, industry, building and transportation sectors. This has been a traditional role delegated to national authorities, like the EPA in the Swedish public administration system. In this respect the Environmental Objectives Council (EOC) was a novelty in Swedish environmental policy. It had two main roles: First, to facilitate coordination and collaboration in the implementation, monitoring and follow-up of he EQOs. Secondly, the EOC was delegated the responsibility for assessment of the EQO strategy and for providing the government with proposals for the revision of targets and strategies for achieving the objectives agreed. The EOC is innovative in itself because drafting authority is delegated to a new institution within the public environmental administration, which traditionally has a more limited role to provide political decision makers only with basic data.

The most important role of the Dutch institutional innovation has been to start up transition processes and organize and manage transition platforms were key actors participate. Facilitation and enabling are key concepts. Crucial authority of this institutional innovation lies with the scientific community and particularly closely to evolving research on socio-technological transformations and their management. Initially, there was no clear mandate nor how processes should be organized or what should be in focus. Transition theories have been sanctioned and supported broadly by the Dutch government and parliament since the late 1990s but has evolved gradually into transition platforms and pathways, often based on reflection and interaction between researchers, policy makers and various stakeholders. This is also consistent with the learning and reflective aspects of transition models and specific researchers were involved in developing the language, models and thinking around transitions. The importance of theory to the practice of the transition approach meant that transition researchers and transition science is delegated authority in the process. Yet, the solid support of government and policy gives necessary political authority to the processes that have been initiated and also enables resource allocation. In looking more specifically at energy transitions, the ministries, and particularly the Ministry of Economy, have played an important and active role in setting up the energy transition platforms and thereby formulating the areas where transition processes should be initiated. In the process of institutionalization of the Energy transitions it appears that the political and administrative influence over the process has increased, i.e. the Dutch government seems to have ‘brought back’ authority over the energy transition process. This is exemplified by a number of bodies monitoring the energy transitions such as the taskforce, the inter-departmental directorate and the forerunners desk. While these bodies might be novelties in their own right, they indicate that the site of authority for energy transition has moved from the scientific

community to the government and changed from a bottom-up approach to a more top-down monitored one.

When looking at the intended role of the institutions there is a clear leaning towards the green liberalist perspective. In the UK and Sweden expert driven rationality is very pronounced. The role of the institutions is to provide advice on goals and policies based on expert knowledge. Although deliberation within administrative expert networks is recognized as an important part of the process, deliberation with civil society groups or citizens is not a priority. Also in the Dutch case, where a main role of the institution is to enable discussions and networks between non-state actors it has always been about a selected and limited set of actors. Hence, there is a strong reliance on an expert rationality even though it is not necessarily administrative experts that have a priority status. There is a strong focus on expert and technical knowledge in the energy transition field as opposed to lay knowledge or the contribution of civil society. This tendency deviates from what anecocentric perspective would stress, namely, the importance of including the broadest possible range of actors in the transformation process. It may be expected that technical experts will come up with technical solutions to problems that might have a much broader set of solutions, and are understood differently by people with different skills, perspectives and knowledge.

3.4 What are the institutional practices?

In this section we look at what the visions related to the three institutional innovations have generated in terms of institutional practices. Because the institutions were set up at different times, with the UK being the most recent, the possibility to evaluate them differs.

In the Dutch case there is a certain tension between the theory of transition management and the institutional practices of the energy transition approach. Specifically regarding the energy transition approach of the Dutch government, it is clear that the tendency from the start has been for the government to take more charge of the process than what the theoretical models dictate and change the concepts and practices that have been introduced for example in transition management models. According to transition theory the government should have a marginal role and not interfere but just enable and support the processes established by transition arenas. In practice the government has played a more active role in agenda setting, selection of participants, coordination and policy making in Dutch energy transitions.

For transition theory, transition arenas are key to initiate the transition process and generate the system change envisioned. Transition arenas are network-type organizations but they are neither representative nor self-organizing. Transition theory stipulates specific criteria for the selection of the transition team

and specific models for the envisioning work within the transition arenas. The transition arena consists of a limited number of actors chosen because of their 'innovativeness' and forerunner status in terms of new ideas and inventions (Loorbach and Rotmans 2010, 243). This aspect of transition management and theory has been heavily criticized due to its lack of democratic representation and accountability. The innovators and forerunners of transition management, when it comes to practice, tend to be middle-aged male from the engineering field or from the political and economic elites (Hendricks 2009).

After transition management thinking was introduced by the Ministry of Environment "the Ministry of Economic Affairs took over a great deal of the principles of transition management" and developed it in close connection to the liberalization and privatization trends that had already been initiated in the energy field (Kemp and Rotmans 2009, 312). The transition platforms came to be dominated by business representatives and regime incumbents that had interests in the existing energy system. The government's interest seemed to be in including the most important energy actors and this meant that incumbent regime actors became highly influential. As an example, the special task force which was set up to monitor the overall process was led by the CEO of Shell (Scholten 2009). It could be argued that this undermined key dimensions of transition theory, which set out to encourage niches that would developed outside the regimes by innovators and forerunners but hampered by existing regime actors. James Meadowcroft's (2009, 336) observation is appropriate and worth re-stating. He says that "*transition-management-in-practice* looks a bit more like *policy-as-usual* than would be recommended by *transition-management-in-theory*".

In the Swedish case, the EQO strategy has been successfully institutionalized to the extent that it has set the long-term priorities for and provided the defining framework for environmental policy and governance. This is especially true for state-led environmental governance at various levels, although these priorities have not trickled down to other actors to the degree initially hoped for. The EOC has played a critical role in this. First, the EOC has developed a comprehensive structure and organization for the monitoring and regular follow-up of goal attainments, for instance by imposing a new system of indicators in accordance with the targets agreed. These have been reported annually to the government and been publicly communicated on the EQO website. Second, the EOC has provided a site for cross-sectoral cooperation, negotiation and deliberation within the public administration on the adoption of sector targets and implementation of appropriate measures in various sectors. The Energy Efficiency and Transport (EET) strategy has made up to eight different authorities collaborate closely to promote a broad portfolio of measures, although most are yet to be implemented and achieved. Although successful in its cross-sectoral ambitions one problem with the EET strategy, and mitigation policy more generally, is the

strong bias towards specific short-term measures and the focus on cost-effectiveness. What is lacking is a comprehensive account of what it takes to instigate the large-scale and long-term transformation processes required for the transition towards low-carbon futures.

The EOC is in its operation and functions clearly based on administrative rationality and reliant on the expertise of public authorities and other actors (e.g. NGOs) closely intertwined with the public environmental administration. On a general level this applies to the overall EQO reform as well, although the specific policies and measures introduced to achieve the targets set consist of a mix of different policies and governance forms. In the field of climate policySweden has made use of a set of market-based policy instruments such as energy and carbon taxation and tradable quotas for renewable energy. Further, informative instruments such as campaigns and labeling have been used for informing different target groups in industry and the civil society as well as individual citizens. It is questionable however whether these information activities build on deliberative rationality, rather it seems to reflect a strategy for persuading the general public to ease implementation (Lundqvist 2004; Hildingsson 2010).

At the time of writing the Swedish EQO system is being reorganized. After the last full reassessment (EOC 2008) was published the government appointed an investigatory inquiry to suggest organizational reforms (SOU 2009:83). The Parliament has recently passed a bill according to which a new parliamentary committee will replace the EOC in its role to reassess targets and implementation strategies (Bill 2009/10:155). It remains to be seen whether the new organization will stand an eventual change in government in the national elections this autumn. But, at least, this ‘politicizing’ indicates conflicts regarding how the environmental administration should best be organized and what the role of political and bureaucratic levels should be in policy implementation.

It is still too early to say anything conclusive about the outcomes of the UK case but the institutional set-up can give us clues on how successful it might be. In the UK a crucial question is to what extent the new institutions succeed in putting pressure on government to maintain an ambitious climate policy and convert policy ideas to policy practice. The CCC, the carbon budgets and the long-term climate goal can, taken together, be seen as an attempt to create something assembling a central bank for the climate. However, it is a soft form of central bank without decision-making power on crucial policy issues. Instead its authority comes from giving independent expert advice and setting the agenda on climate policies. Although it is only an advisory body it is difficult for the government not to follow the advice of the CCC and deviations will have to be openly motivated. In this way the CCC strengthens the transparency and accountability of UK climate policy. In practice, the CCC has had a strong influence both on the

formulation of the 80% target and on the contents of the first three carbon budgets (from 2008 to 2022). A crucial question is whether there is a sufficient connection between the radical long-term goals and the actual measures suggested in the carbon budgets, something which has been debated by the environmental movement (Friends of the Earth 2009). The strong expert focus of the CCC and its internal organization may best be described as an elite expert network. The CCC does not seem to be a very inclusive organization. Even though a stated aim is to "engage with representatives interested in climate change from across the UK" the purpose of this engagement is mainly to "gain input into [their] analysis" (Committee on Climate Change 2010b). This signals a top-down view on participation and the reports are mainly internal products of the staff at the CCC.

A common feature of all three cases is that there is a strong leaning towards technological solutions and technocratic processes, while questions of behavioral change, value conflicts and moral issues are largely marginalized. In the Netherlands the crucial focus on innovation suggests that (socio-)technological solutions are at the core of the transition approach and confirmed by studying the pathways suggested by the various energy related platforms (Energy Transition Task Force 2006). Still, while the theory of transition management represents a technical optimism it opens up for other types of transition processes that are more about value re-framing, reflection and changing behavioral practices. Indeed, Meadowcroft (2009) seems to consider this not only the most innovative but also the transformative aspect with most potential of the Dutch transition approach. In the energy arenas technocratic solutions have been totally dominant which can be traced back to the limited and homogenous character of the networks. In the UK there is nothing in the institutional set-up that per se favors either technocratic or behavioral solutions or transition pathways. However, in the reports from the CCC and in the first carbon budgets we can see that technological solutions dominate. The first report of the CCC (2008, xv) "Building a low-carbon economy" gives an idea of what kind of transition it envisions and how this should be brought about. The report states that "the majority of the 80% cut will in the long term need to be achieved via domestic action", which is an argument to start implementing radical domestic policy reform already today. There is also a clear technology focus and technical optimism in the view on what a transition will involve. While a range of different mitigation technologies is identified (e.g. renewable energy, energy efficiency, CCS, nuclear energy, hydrogen, electric vehicles),the need for behavioral and lifestyle changes is mentioned but not further analyzed. In some sense, the Swedish EET strategy stands out in its emphasis on behavioral changes for a more efficient use of energy and transportation (EPA 2007). However, the portfolio of measures advocated do not stretch beyond the provision of economic incentives and regulatory requirements that might enable improvements in energy efficiency in industry and buildings, and in transport planning and infrastructure investments.

In their institutional practices the three cases resemble even more the green liberalist perspective. For the UK and Swedish cases we can see how the green liberalist views on the role of state and market actors, on authority and on governance rationalities, shows up in the institutional practice. In the Dutch case we can see how the institutional practice moves more in the direction of the green liberalist perspective, despite other intentions in the theory of transition management. In particular, the extended role of the state and the outcome of more elitist and closed networks point in that direction. All three cases embrace a technocratic vision of a low-carbon future which is characteristic of the green liberalist perspective.

4 Concluding discussion

In this paper we have analyzed three institutional innovations in climate governance at the national level, in the UK, the Netherlands and Sweden. Our main interest has been to explore how well suited these new institutions are for making climate a core political concern and aiding in the transition towards low-carbon futures. Our ambition is to learn from these cases and say something more general about what institutional features and reforms are needed for the transition. A general conclusion is that all three examples have undoubtedly strengthened climate governance by institutionalizing a focus on long-term goals and the need for radical transformations and by improving state reflexivity and responsiveness to climate concerns. In the UK this has been done through a combination of legislative reform and the creation of a new independent climate body, which has increased transparency and accountability in climate governance. In Sweden the Environmental Quality Objectives have strengthened a focus on long-term goals and the institutional reforms have increased integration and cooperation within the state administration. In the Dutch case and through the transition approach a ‘new’ kind of thinking, informed by transition theories, have been firmly planted within government, across a range of ministries and sectors and it seems that over the years the transition ideas have taken hold quite broadly also outside science and governments. The ‘new’ thinking concerns the way that the transition of socio-technical system is understood and the way the governance process is conceptualized. Elements like learning, reflection are key to this and so are deliberative processes. These innovations can be seen as different ways to ‘green’ the state and the economy, and to introduce a new way of thinking in institutions and state governance.

What we also have seen in all three cases is that they present ways to work across sectors. To work across sectors, rather than within them, has for long been a key challenge for environmental policy-making. Sector integration is the way to deal with it and these innovations all try to do so in slightly different ways. The Dutch interdepartmental project directorate is one example. It has united policy makers from

six ministries in the strategic thinking on energy transitions. The main objective of the Swedish EQO strategy was to ensure cross-sectoral collaboration in the implementation of specific sustainability goals. The Environmental Objectives Council was the general institutional mechanism for this, while the EET strategy an example of efforts to assure policy integration across various sectors in climate governance.

Although the three cases represent clear advances in climate governance they are still rooted in existing administrative and institutional structures. In spite of their 'newness' our study shows that it is rather difficult to be really innovative. The institutional reforms we have studied are mainly about building new institutions within existing structures and not about challenging these structures. This has been most evident in the UK and Sweden were institutional innovations have relied on traditional hierarchical authority and a strong and active role for state institutions as a driver of change. The institutional reforms in these cases have not been about changing the relations between the state and other actors nor about innovation regarding governance practices. Rather they have been more concerned about reinforcing the priority of climate change within state institutions and strengthen state governance in policy implementation. The implicit view on how to govern societal change towards a low-carbon transition is that the state has to define the goals and set the priorities and then introduce policy instruments and incentives that make other actors to change their behavior.

In the Dutch case the theoretical foundation behind the institutional innovation is different and a core idea is to create new arenas and networks were innovators and frontrunners can come together to deliberate on how a sustainable future should look like and how it can be achieved. These networks are intended to challenge the incumbent regimes and create processes of change in new niche areas. The role of the state is to be an enabler but not to interfere in the processes that should be driven by other societal actors. We have seen that also in the Dutch case exemplified in the energy transition area, the institutional practices tend to be drawn back into traditional patterns and becoming more reliant on the government agenda and strong economic interests. This shows that there is a strong resistance within existing structures against institutional change. Incremental changes are possible and even quite drastic reforms, but innovations that threaten the authority of core institutions will be prevented or translated into less radical forms.

Another conclusion from the cases is that there is clear leaning towards technological solutions in the views on how to attain low-carbon futures. The institutional innovations are thus situated within the dominant discourse on energy transitions that emphasize innovation, technical change, the importance of market actors and the possibility to find win-win solutions to the climate challenge. Much less is said about value conflicts, the need for behavioral change, the role of civil society and visions of alternative

paths to a low-carbon future. Though there is a vibrant debate going on in the green movement and within green political thought about the need to question current economic and political structures, this has had little impact on the institutional innovations studied in this paper.

Having noted the drawbacks of institutional practices in the three cases studied, we remain convinced that these institutions, nevertheless exemplify significant innovation in climate governance as they introduce long-term perspectives in the policy process, ensure priority on climate change and encourage learning and reflection. The promise of the institutions is however valid only to the extent that a technocratic vision of a low-carbon future is viable. It should be recognized that they contribute to locking in climate action into one particular development path. This is problematic because we think that there is a need to allow for a broader discussion and more differing views on the transition process, something that will put tough reform requirements on new types of institutions.

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