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Climate change adaptation at different levels of government: Characteristics and conditions of policy change

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Abstract

Climate change adaptation strategies that aim to minimize harm and maximize benefits related to climate change impacts have mushroomed at all levels of government in recent years. While many studies have explored barriers that stand in the way of their implementation, the factors determining their potential to mainstream adaptation into various sectors are less clear. In the present paper, we aim to address this gap for two international, six national, and six local adaptation strategies. Based on document analyses and 35 semi-structured interviews, the 14 case studies also explore in how far the factors facilitating climate change adaptation are similar across levels of government or level-specific. Although located at three different levels of government, we find that the 14 adaptation strategies analyzed here represent "one-size-fits-all governance arrangements" that are characterized by voluntariness and a lack institutionalization. Since adaptation strategies are relatively weak coordination hubs that are unable to force adaptation onto sectoral policy agendas, they rely mainly on sectoral self-interest in adapting to climate change, largely determined by problem pressure. We conclude that one-size-fits-all governance arrangements are rarely adequate responses to complex challenges, such as climate change. Although climate change adaptation depends more on framework conditions such as problem pressure than on administrative or governance features, the findings presented here can help to understand under what circumstances adaptation is likely to make progress.

Keywords: Climate change adaptation; adaptation strategies; levels of government; adaptation governance; policy change.

1. Introduction

Public policies on climate change adaptation aim to minimize harm and maximize benefits related to climate change impacts so that societies become less vulnerable and more resilient (Adger et al., 2005; Fichter et al., 2010; Noble et al., 2014). However, since climate change is a superwicked issue, coping with its impacts is a highly complex challenge (Termeer et al., 2013). To mention just a few challenges, climate change impacts are often highly uncertain, can vary within a few kilometers, and usually affect not one but several sectors and levels of government. Consequently, most scholars and policy-makers agree that adaptation policies have to be mainstreamed (or integrated) horizontally into various sector policies and vertically across all levels of government (Bauer et al., 2012; Jordan et al., 2012; Dewulf et al., 2015b; Widmer, 2018).

To address these and other challenges, governments at various levels (in particular national and city governments) began to develop comprehensive adaptation processes, usually organized around a multi-sectoral policy strategy and/or action plan (Biesbroek et al., 2010; Bauer et al., 2012). Most of these processes aim to facilitate adaptation in and across a variety of relevant sectors at a particular level of government (Casado-Asensio and Steurer, 2014; for an exception see Bauer and Steurer, 2015). However, so far, we do not know much about the effectiveness of adaptation strategies in achieving this objective and the reasons behind this (for rare exceptions see e.g., Persson and Runhaar, 2018; Runhaar et al., 2018). While problems, barriers of adaptation policies, and strategies have been analyzed repeatedly (see e.g., Biesbroek et al., 2011; Arens, 2012; Jordan et al., 2012; Clar et al., 2013; Biesbroek et al., 2014), the factors determining their potential to integrate adaptation into various sectors at different levels of government are less clear. Even the European Environment Agency's comprehensive report about adaptation in practice (EEA, 2013) does not establish a causal relationship between adaptation

strategies and the actual implementation of adaptation measures. The present paper aims to address this gap by answering the following questions:

- What factors enable adaptation strategies to facilitate adaptation at different levels of government?
- In how far are these factors similar across different levels of government or level-specific?
- To what degree and how can these conditions be influenced by policy-makers?

These questions are relevant for at least two reasons. First, adaptation strategies are supposed to be the key hub of adaptation policy-making in most countries (Bauer et al., 2012). An analysis of factors that promote adaptation supports their contribution to capacity building and adaptive management (EEA, 2013). Second, addressing the role of adaptation strategies at and across various levels of government is important because adaptation is a multi-level challenge that requires vertical interactions (Adger et al., 2005; EEA, 2013).

We answer these questions by summarizing the findings of 14 qualitative case studies on adaptation strategies from different levels of government. The embedded case study design (Yin, 2003) allows us to explore in how far the conditions of facilitating adaptation with comprehensive strategy processes are "universal" or level-specific, and in how far adaptation strategies interact with each other across levels of government. At the national level, we analyze adaptation strategies of four European (Denmark, UK, Finland, the Netherlands) and two non-European countries (Australia, Canada). We selected these countries because they were among the first to adopt a national adaptation strategy and/or because they pursue innovative adaptation approaches (for the Netherlands, see Bauer and Steurer, 2015). At the sub-national level, we look at one rather large city for each of the six countries (Copenhagen, Helsinki, London, Melbourne, Rotterdam, Vancouver) because they also address adaptation more actively than the smaller ones (Dannevig et al., 2012). With the adaptation strategies of the EU and the Baltic Sea region, we add two additional transnational levels. The adaptation strategy of the Baltic Sea Region developed out of the EU Strategy for the Baltic Sea Region,[1] is co-financed by the EU and is supposed to "contribute to the implementation of local and national strategies as well as the EU Strategy on Climate Adaptation" (CBSS, 2013:19). Thus, it represents an intermediary strategy between EU and national efforts.

The case studies combine document analysis and a total of 35 semistructured interviews. To better understand in how far adaptation strategies are able to involve relevant sectors, we interviewed not only a person representing the institution that is mainly responsible for coordinating the adaptation strategy (usually from the environment department or ministry), but also a representative of the water sector (a key sector for adaptation[2]), and a non-state adaptation policy expert for most of the 14 cases.[3] The interviews were conducted between November 2013 and April 2014 (33 via telephone or skype, two via e-mail; 33 in English, two in German) and they lasted between 30 and 90 minutes (for the interview guide see Supplementary Materials Annex 4). They were transcribed partly and analyzed systematically with the MAXQDA software, based on the analytical frame introduced in Section 2. References to the interviews are coded anonymously (for details see Supplementary Materials Annex 1). The empirical study period ends with 2014. Only scholarly literature has been updated afterwards.

In Section 2, we explore success in adaptation policymaking and highlight factors potentially relevant for policy change. In Section 3, we introduce our case studies, and in Section 4, we analyze them with regard to our research questions. In Section 5, we summarize the answers to the research questions and draw policy-relevant conclusions.

[1] https://www.balticsea-region-strategy.eu/ (accessed 9 November 2018).

[2] This is supported by the EEA (2013:75). Its overview of "sectors identified and addressed in national adaptation policies in Europe" ranks water management and water resources as most often mentioned (along with forests and forestry).

[3] We did not interview sector representatives at the transnational level because the two respective processes do not target them directly.

2. Mainstreaming climate change adaptation: A literature synthesis on policy change

Mainstreaming climate change adaptation into sectoral policies requires either adopting new or changing existing policies. Both options imply usually contested policy change. Identifying the factors determining policy change is a delicate endeavor that has kept policy analysts and evaluators busy for decades. Already in the 1990s, environmental policy scholars had pointed out that environmental improvements are not the only indication for policy change. In addition, the launch of a transformation process that has not yet resulted in environmental impacts can be regarded as a relevant (or even successful) aspect of policy change (Jänicke and Weidner, 1995; Jänicke, 1996). Since proactive adaptation policies are concerned with easing possible future climate change impacts, it is almost impossible to assess their effectiveness in doing so today. Thus, we analyze them as potential initiators of long-term policy changes. For now, adaptation strategies can be regarded as potentially successful if they are able to engage policymakers from non-environmental sectors in adaptation policy-making.
To ensure that we do not lose focus in answering our research questions, we first screened the literature on policy change in general, and on environmental/climate policy integration (or mainstreaming) in particular. By doing so, we identified several key factors of policy change that emerged in both literature strands repeatedly (for an overview, see Supplementary Materials Annex 2). These factors are concerned with the role of ideas and solutions, actors and actor coalitions, governance aspects of policymaking, and framework conditions. Several other factors and related features (such as political issue attention cycles or economic cycles) could have been added, but not within the scope of this article. Now, we briefly highlight the significance of each factor for policy change. As can be seen from the synthesis and the conclusions of our findings in Sections 4 and 5, these factors are not isolated but interact with each other.

The attractiveness of policy ideas and solutions is important for their likeliness of being implemented, and for their potential in solving problems. Usually, ideas, aims and solutions are reflected in policy documents (such as strategies and action plans), but often rather vaguely, inter alia, because this makes their implementation more flexible (Nordbeck and Steurer, 2016; Clar, 2019). In climate change adaptation, flexibility is important because it enables policy-makers to take new evidence (including events) into account (Kristof, 2010). The attractiveness of policies depends on many characteristics: how they affect the interests of different actors, how they perform in the long term under uncertainties, and the details of the employed policy instruments. Regarding interests, policy solutions are most attractive when they promise to combine environmental improvements with sectoral benefits (i.e., win-win solutions). However, since win-win solutions are rare, policy strategies should address and resolve conflicts pro-actively (Kristof, 2010). Regarding uncertainties, policy solutions are attractive when they cost little and promise improvements, irrespective of how the climate will change in the future (also referred to as no or low-regret solutions; see Hallegatte, 2009; Füssel, 2007). Regarding policy instruments, policy-makers can choose from a wide spectrum, ranging from mandatory (or hard) instruments (such as laws, regulations, fees, taxes, and permits) to voluntary (or soft) instruments (such as campaigns, voluntary agreements, or subsidies). While Pollack and HafnerBurton (2010) as well as Jordan et al. (2012) emphasize the importance of hard regulatory approaches (in particular in the EU context), many scholars recommend applying a broad instrument mix (Persson, 2004; Fichter et al., 2010; Flanagan et al., 2011; Brouwer et al., 2013).
Policy change also depends on actors who are usually organized in actor coalitions. Those who are fully dedicated to promote an issue, also known as "policy entrepreneurs" (Kingdon, 1984; Karlstetter et al., 2010; Sharman and Holmes, 2010; Mintrom and Luetjens, 2017), "pioneers of change" (Kristof, 2010), or "change agents" (Grin et al., 2010; Kristof, 2010; Sommer and Schad, 2014) play a key role. Their ability to promote policy change depends on several characteristics, such as power through formal

hierarchies or resources (Tsebelis, 2002; Skodvin et al., 2010; Pittcock, 2011; Sommer and Schad, 2014), charisma, professional skills and qualifications (including leadership qualities and the ability to communicate effectively), networks, and coalitions at their disposal (Biermann and Siebenhüner, 2009; Fichter et al., 2010; Kristof, 2010 ; Bauriedl, 2011). Unfortunately, environmental policies and strategies (those on adaptation being no exception) are usually in the hands of relatively weak environmental ministries (Steurer, 2008; Pittcock, 2011; Nordbeck and Steurer, 2016) and other ministries that often regard environmental issues as dangerous to their interests or as irrelevant. Adaptation can be different because respective measures are usually in the self-interest of a particular sector. Either way, change agents should be aware of possible resistance and address it constructively (Kristof, 2010; Bauriedl, 2011). Political actors rarely act on their own but usually engage in so-called advocacy coalitions or policy communities. These groups of state and non-state actors aim to shape policy-making based on common values and interests. Policies that correspond with the views of the more powerful group of actors are more likely to be implemented (Kingdon, 1984; Coleman and Skogstad, 1990; Sabatier, 1993; Weible et al., 2009; Flanagan et al., 2011; see also Atkinson and Coleman, 1992; Skogstad, 2005). Among equally powerful groups, change agents can make a difference. They are often senior actors with outstanding knowledge, experience, and networks (Hall, 1993; Baumgartner, 2013).

Procedural (or governance) aspects of policy-making can also facilitate or hinder policy change. Since climate change adaptation is a complex issue that transverses ministries and levels of government, effective horizontal and vertical coordination mechanisms are indispensable (Dewulf et al., 2015b; Widmer, 2018). Although multi-sectoral strategies aim to trigger and organize them systematically, so far, they have not been effective in doing so (Biesbroek et al., 2010; Casado-Asensio and Steurer, 2014). According to Biesbroek et al. (2010), there are four ideal-typical prerequisites for effective horizontal adaptation mainstreaming: (i) a powerful lead institution; (ii) adaptation units in departments of vulnerable sectors; (iii) interdepartmental units that facilitate exchanges between them; and (iv) input from other governmental levels. While vertical coordination between local and national governments are important in all countries, federal states add the need to coordinate adaptation policies also between regional and national governments. Interactions between all three levels are important because their adaptation capacities vary considerably: while local actors usually know local climate change impacts and adaptation needs best, regional or national actors usually have more scientific expertise and resources at their disposal (Urwin and Jordan, 2008; Berkes, 2009; Amundsen et al., 2010).

Since adaptation faces highly uncertain climate change impacts, establishing a dynamic science-policy interface is another key governance challenge (Biesbroek et al., 2010; Sharman and Holmes, 2010; Bauer et al., 2012). Science can produce relevant knowledge not only about climate change and its impacts, but also about policy-making and its effectiveness. So far, climate science is brokered to policy-makers with various arrangements (Hermann et al., 2015), and social science is often concerned with monitoring and evaluating policies. Although monitoring and evaluation feedback loops can trigger policy learning (Preston et al., 2011), this has not been observed for comprehensive environmental strategies, such as those on adaptation (Steurer, 2008; Casado-Asensio and Steurer, 2014; Clar, 2019).

Governance features can facilitate or hinder policy implementation. While implementing comprehensive policy strategies requires some sort of institutionalised governance (such as annual work plans and reporting), these mechanisms must be flexible enough to account for environmental and political ad-hoc changes. This is particularly important in complex policy fields that are characterized by high levels of uncertainty (Dovers and Hezri, 2010; see also Pahl-Wostl et al., 2007; Collins and Ison, 2009a, 2009b; Späth and Rohracher, 2009; Karlstetter et al., 2010; Tschakert and Dietrich, 2010; Preston et al., 2011; Amaru and Chhetri, 2013). Of course, implementing policies also depends on political will and the provision of resources (Beck et al., 2009; Brouwer et al., 2013). Unfortunately, most comprehensive environmental strategies are not granted extra budgets. Instead, they

try to divert existing resources to new (environmental) purposes, often without success (Casado-Asensio and Steurer, 2014; Nordbeck and Steurer, 2016). Finally, policy change is frequently triggered and shaped or prevented by (persistent) framework conditions. Among them are societal aspects such as path dependencies (Leach et al., 2007a, 2007b; Kristof, 2010; Knox-Hayes, 2012), public values, and opinions (Kabat et al., 2005; Kristof, 2010; McEvoy et al., 2013), but also events (such as accidents or weather extremes) that can open so-called "windows of opportunity" or "policy windows". The latter usually opens when different aspects of policy-making (e.g., events, public discourse/politics, and policy solutions) coincide (Hall, 1993; Tompkins and Amundsen, 2008; Biesbroek et al., 2010; Dovers and Hezri, 2010; Kristof, 2010; Moser and Ekstrom, 2010; Baumgartner, 2013). Since we are most interested in factors that can be shaped by adaptation strategies, we do not focus our analysis on persistent framework conditions, but we highlight their importance throughout the paper, particularly in the conclusion.

3. Introducing the cases

This section introduces our two transnational, six national, and six municipal adaptation case studies. Within their level of government, we present the oldest processes first and the newest ones last (for an overview see Supplementary Materials Annex 3).

3.1. Transnational strategy processes

In 2013, the EU Commission adopted the EU Strategy on adaptation to climate change. It aims to support and "standardize" adaptation efforts in member states (not at the EU level), with an emphasis on transboundary issues in selected key sectors. Thus, the EU strategy does not initiate and implement adaptation policies directly but aims to support member states in doing so. The BaltAdaptStrategy for adaptation to climate change in the Baltic Sea Region (2013) developed out of the EU Strategy for the Baltic Sea Region. Like the EU adaptation strategy, it also complements national and local adaptation strategies in the region.

3.2. National strategy processes

Among the first national adaptation strategies worldwide were those in Finland and Canada, both adopted in 2005. The Finnish strategy outlines impacts of climate change and adaptation options for 10 sectors, and some crosssectoral issues. It served as the basis for two more detailed action plans adopted by the Ministries of the Environment in 2008 and of Agriculture and Forestry in 2011. Since Canada is a federal country, the Canadian "adaptation framework" was developed by a joint working group representing the Canadian federation, its states, and territories. However, since the federal ministry, overseeing the coordinating of its implementation, was abolished shortly afterwards, no one felt responsible for this task. In 2007, the federal government adopted a Federal Adaptation Policy Framework that only aimed at coordinating federal adaptation policies. In 2007, Australia and the Netherlands also adopted national adaptation strategies. The Australian adaptation framework aimed to develop adaptation capacities at the state, territorial, regional, and local levels. In 2010, the newly incoming Labor government adopted its own national agenda for adaptation to climate change. As the title suggests, the Dutch National Programme for Spatial Adaptation to Climate Change from 2007 had a strong focus on spatial planning as a key concern for other sectors, to be further narrowed to flood protection soon after its adoption. Since these issues are governed at multiple levels, the Dutch government also involved provincial and local actors in formulating the strategy. Since the sectoral focus of adaptation was criticized by the EU, the Dutch government adopted a second comprehensive adaptation strategy in late 2016.[4] Like the initial Dutch strategy, the Danish adaptation strategy from 2008 was also developed by an interministerial working group in cooperation with local and regional authorities. It outlines different scenarios for sectors potentially affected by climate change, and

[4] https://www.rijksoverheid.nl/documenten/rapporten/2016/12/02/nationale-klimaatadaptatiestrategie-2016-nas (accessed 5 March 2017).

addresses research, information, and coordination as cross-sectoral issues. An action plan adopted by a new government in 2011 places stronger emphasis on the implementation of concrete adaptation actions, mainly concerned with flooding due to heavy rainfalls. The UK adopted a Climate Change Act in 2008. It requires England, Northern Ireland, Scotland, and Wales to adopt a national adaptation strategy. The British strategy from 2013 focuses on the sectors identified as most vulnerable in a Climate Change Risk Assessment conducted by the Department for Environment, Food and Rural Affairs (DEFRA) in 2012. Compared to other strategies, it provides a very detailed registry of objectives, adaptation polices, owner(s), and deadlines for implementation.

3.3. Local strategy processes

Among our municipal case studies, the City of Melbourne (Australia) was the first to publish an adaptation strategy in 2009, in response to a public development initiative that identified adaptation to climate change as a priority area. It compares a future Melbourne without any adaptation to one adapted to possible climate change impacts. A year later, the strategy was followed by a complementary action plan outlining short-term (2011–2012) and medium-term actions (from 2013 onwards) for six action areas.
In Europe, Rotterdam had already adopted an adaptation programme in 2010. It started out with seven projects in five key themes, and addressed these themes more comprehensively later. The remaining four European cities that we cover here all adopted their first adaptation strategy in 2011. The City Council of London did so in response to the UK's Climate Change Act from 2008. As part of a comprehensive development initiative, it identifies flooding, droughts, and heatwaves as key challenges. The Climate Adaptation Plan of the City of Copenhagen addresses short as well as medium term challenges, three scenarios for 2010, 2060, 2110, and concrete adaptation projects. The Helsinki Region Environmental Services Authority (HSY) elaborated an adaptation strategy for the Finnish metropolitan area based on a number of already existing policy documents and research projects related to climate change adaptation. It proposes policy guidelines and mainly shortterm adaptation actions for the period 2012–2020.
In 2012, Vancouver developed its Climate Change Adaptation Strategy in response to the IPCC Fourth Assessment Report (2007). It aims to increase the understanding of climate change impacts and to integrate climate change into planning, design, and emergency management.

4. What drives adaptation policies at differentlevels of government?

Like other comprehensive policy strategies, those on climate change adaptation also struggle with changing policy-making in relevant sectors (Casado-Asensio and Steurer, 2014), even though they are supposed to serve as hubs of adaptation governance (Bauer et al., 2012). In this section, we highlight the conditions under which comprehensive adaptation strategies are likely to facilitate policy change in climate- sensitive sectors. We focus this analysis on some key aspects identified in the literature review (see Section 2).

4.1. Ideas and proposed solutions

In most cases, adaptation strategies provide only vague objectives and solutions that do not appeal to immediate implementation. This may be partly due to the considerable uncertainties of climate change impacts, but it may also reflect the rather weak political will behind adaptation. Resonating the literature (see Section 2), the interviewees who defend the vagueness of adaptation strategies argue that this gives policy-makers not only flexibility, but also that it encourages them to apply their expertise (CAN2, HEL1, ROT1). However, some interviewees criticized the vagueness that makes horizontal coordination more difficult, especially for inexperienced and "weak" actors (CAN1, FIN3, LON3). While 19 of 21 coordinators and sector representatives defend the level of detail of their own strategies, only three (CAN1, LON2, NL1) are open to the argument that defining (more) concrete measures could ease their implementation.

Regarding instrument choices, all interview partners agree that adaptation strategies should promote a broad mix of legal, economic, informative, and partnering instruments for various reasons. They argue, for example, that the complexity of adaptation demands it (AUS1, ROT3), or that a broader range of instruments helps to reach more actors (BAL3, MEL1). Coordinators of transnational and national strategies often prefer soft interventions (e.g., awareness raising, information, research funding, etc.), mainly because they provoke less resistance (AUS1, BAL1, CAN1, DEN1, EU1). However, without having proof, several national and local interviewees believe that hard instruments are likely to be more effective (DEN2, MEL3, NL2, ROT2). Most interviewees assume that all types of interventions need to be compatible with the routines of their target groups (see also Brouwer et al., 2013: 146), no matter if they are other sectors or other governmental levels (BAL1, EU1, EU3, BAL3, CAN1, HEL2, NL3, ROT1). Furthermore, interviewees from all levels (in particular from cities) stress the importance of no/lowregret and win-win policies, also because they help to mobilise resources and other actors usually not interested in adaptation (AUS3, BAL3, CAN1, COP1, DEN3, ENG3, EU1, FIN1, FIN3, HEL1, LON3, ROT1,
ROT2, ROT3).
Although the political appeal of ideas and policy solutions also depends on the (conflicting) interests of key actors, most of our interviewees stated that conflicts are hardly an issue in climate change adaptation. They explain this with the soft and/or no-regret character of most adaptation policies that does not fuel conflicts (BAL3, CAN1, COP1, FIN1, HEL1, ROT2), and with the fact that adaptation mainstreaming cannot be forced upon sectoral actors (FIN1, LON3). If hard interventions play a role, they are usually proposed by sectoral actors that are convinced about their benefits (see e.g., NL, VAN). The only conflict potential that they can think of concerns the use/distribution of resources. However, since none of the adaptation strategies can provide their target groups with any financial means, there is little to fight about (COP3, DEN2, FIN1). To promote adaptation, 7 out of 14 cases rely on cost-benefit-analyses of proposed policies (BAL, CAN, HEL, LON, NL, VAN, MEL), but nothing is known about how effective they are in convincing policy-makers.

4.2. Actors

Not surprisingly, actors and their characteristics play an important role for adaptation mainstreaming. For our interviewees, the most common "change agents" are traditional environmental policy-makers who coordinate adaptation strategies. They explain their potential to facilitate policy change with, first, their political and financial clout (AUS3, BAL3, CAN2, MEL1, ROT1, ROT3) and their subsequent ability to initiate laws, issue directives, and provide funds (BAL1, BAL3, DEN1, EU1), and, second, political and networking skills of their key representatives (BAL1, COP3, HEL1, NL2, ROT1, VAN1). In addition, actors facing immediate climate change impacts are often more important change agents than "the usual suspects" identified above. These include national ministries responsible for particularly vulnerable sectors such as water management in Denmark and the Netherlands (DEN1, DEN2, ROT3, VAN1), coastal communities facing e.g., sea-level rise (AUS3, DEN3, NL3), and businesses. The latter can be politically relevant if they are from vulnerable sectors (such as insurance and tourism; AUS3, BAL3, COP3, LON3) or if they offer solutions for climate change impacts such as flood protection techniques (COP3, DEN1). Although these groups of actors share an interest in climate change adaptation, they usually do not engage in advocacy coalitions promoting the topic. While other actors currently not interested in climate change adaptation intervene neither as single veto players nor as members of opposing advocacy coalitions, engaging them in adaptation mainstreaming is difficult and often impossible. Both, the lack of opposition and their disinterest in adaptation has to do with the mostly soft and voluntary nature of the adaptation policy field: since it cannot be forced onto sectoral policy agendas and does not obtain extra resources, adaptation does not deserve to be fought but it can be ignored easily (ENG3, FIN1, HEL1) – at least as long as the sectoral climate change impacts do not materialize (or as long as the causality of disastrous events is contested). If adaptation strategies succeed in involving other

actors, the latter are usually open to adaptation from the beginning, and they are given the chance to "own the process" by co-shaping it. Adaptation strategies that fail to facilitate broad ownership usually do not go far beyond those responsible for their coordination (MEL3; see also below).

4.3. Governance

The most common way to facilitate adaptation mainstreaming horizontally across sectors is to invite sectoral actors in coformulating an adaptation strategy. To interest them in the topic, they are given information on the possible (sectoral) climate change impacts, and they are sometimes offered incentives such as subsidies (AUS1, COP1, DEN1, EU1, FIN1, HEL1). In addition, sectoral actors usually have full control over formulating and implementing "their" sectoral adaptation measures. In how far this sectoral approach facilitates the implementation of adaptation measures is difficult to assess, mainly because policies are formulated vaguely (see above) and their implementation is rarely monitored or evaluated (see below). Consequently, even strategy coordinators are usually unaware of how implementation progresses (AUS1, CAN1, ENG1, FIN1, HEL1, MEL1).

The importance of coordinating adaptation vertically with lower governmental levels is mentioned in all but one transnational and national strategy, and many interview partners from all governmental levels confirm this (AUS1, BAL1, COP1, FIN3, MEL1, NL1, ROT1, VAN1). Our interviewees argue that "adaptation happens at the local level" (AUS1, BAL1), inter alia, because only local communities have the expertise for tailoring adaptation to locally diverse climate change impacts (COP1, MEL1, ROT1, VAN1). This corresponds with Dewulf et al. (2015a: 2) who argue that "the nature of the climate change adaptation problem is generally framed at the regional [...] or the local level". Nonetheless, we found no institutionalized arrangements of vertical coordination aiming to facilitate the implementation of adaptation policies. In addition, the transnational and national adaptation strategies in our sample do not try to shape adaptation at lower levels through legally binding requirements. The coordinators of these processes underline that they are either not in the position (AUS3, BAL1, BAL3, CAN1, CAN3, DEN1) or do not want (AUS1, CAN1, EU1) to dictate anything. What we did find in terms of facilitating implementation across levels of government were a few collaborations between national and local actors on an ad hoc project basis, in particular when the problem pressure was high, and no easy fixes were available (e.g., regarding water security in London and Rotterdam [LON2, ROT3] and disaster management in Melbourne [MEL3]). Apart from this, national actors fund research relevant for the local level (CAN, NL), and they support municipalities (on demand), e.g., with information (AUS, DEN, NL) or counselling (CAN, DEN, MEL). Transnational actors also fund research that is relevant for national and local actors. Apart from this, they limit their interactions with other levels of government to networking. An exception in this regard is the relationship between the EU and the Baltic Sea adaptation strategies: the latter has been initiated by the EU and still depends on EU funding. Although the relationship between "local/regional adaptation actions and national-level planning" is tricky to assess and may require in-depth case studies (EEA, 2013), several interviewees are convinced that lower governmental levels are more likely to affect adaptation policies at higher governmental levels than vice versa (COP1, NL1, VAN1, BAL1, BAL3, EU1, EU3).

Although governance arrangements can also facilitate or hinder the implementation of adaptation policies (see Section 2), most adaptation strategies we looked at ignore this issue. After a strategy has been adopted, its implementation is usually neither guided (e.g., through cyclical work programmes) nor monitored properly (see below). Instead, several interviewees from all levels of government make a virtue out of necessity, i.e., they highlight the flexibility of unguided implementation processes, especially for dealing with uncertainties (EU3, DEN2, DEN3, LON3, MEL1). As also found (Casado-Asensio and Steurer, 2014), none of the adaptation processes, except for the one focusing on water management in the Netherlands (see Bauer and Steurer, 2015), obtained additional funding. Not surprisingly, interviewees identify this as problematic for policy implementation, inter alia, because offering extra funds clearly facilitates the implementing of adaptation policies

(CAN1, CAN2, HEL1, HEL2), in particular at the local level. In this regard, Danish interview partners report that the only reason why local authorities formulated and implemented adaptation action plans was that they received subsidies by the national government (DEN2, DEN3). Those who lack financial resources do not struggle with formulating policies in adaptation strategies but with implementing them, and some even lose sight of what sectoral policy-makers are doing (AUS1, FIN1, MEL1). This brings us to the final governance issue addressed here.

Although most interviewees are aware of the complexity and uncertainty of climate change impacts and many of them emphasize the importance of collaborating with scientists (AUS3, BAL1, CAN3, COP1, EU1, MEL1, MEL3, ROT1), in particular at transnational and local levels, we found rather informal exchange formats instead of formally institutionalized relations between policymaking and science (BAL1, EU1, HEL1, LON2, MEL1, NL1, VAN1). Besides, the adaptation strategies in Australia,[5] UK[6] and Canada are the only ones building on comprehensive risk assessments. Other national adaptation strategies commissioned at least sectoral studies (see e.g., the Netherlands; NL1, NL2, NL3), and local strategies sometimes build on existing assessments (COP1, LON2, VAN1). Unfortunately, it is unclear which approach works best. The British and Canadian cases, for example, cannot provide evidence suggesting that adaptation strategies based on comprehensive studies have a better chance of being implemented. Several interviewees emphasize that adaptation strategies should remain open to new knowledge and unexpected developments. Methods that are often used to cope with uncertain futures are scenario analyses
(CAN3, MEL1, COP1, EU1, MEL3, ROT1) and the simultaneous consideration of adaptation alternatives (LON3). Also regarding (social science) assessments of adaptation strategies, our interviewees were not aware of established practices that aim to improve their governance (BAL3, COP1, DEN2, FIN3, LON3, ROT3, VAN1). Four of our cases require at least a regular compilation of implementation progress reports (i.e., Melbourne, Rotterdam, the Netherlands, and the EU). However, in all four cases, it is unclear how governments ought to deal with these reports. As found elsewhere, it is likely that they are shelved without unfolding noteworthy policy implications.

5. Conclusions

In this final section, we highlight similarities and differences of our cases and answer our research questions. Although the adaptation strategies we examined are located at different levels of government, they share some important characteristics: they are usually set up as non-binding, multi-sectoral strategies that depend on voluntary contributions of targeted sectors. Whether the latter implement adaptation concerns their sectoral policies is entirely up to them. This leaves the change agents responsible for adaptation strategies with the following courses of action: they can raise awareness for an issue and, if they have funds available, they can provide incentives such as subsidies. In other words, an adaptation policy foreseen in a strategy document does not mean that it is also on the agenda of sectoral policy-makers, let alone a policy about to being implemented. These shortcomings are aggravated by the fact that adaptation strategies at all levels usually lack institutionalized arrangements for horizontal as well as vertical coordination, and/or for systematic monitoring. This finding coincides with Jordan et al. (2012), who detect a tension between the EU's adaptation policy ambitions and the constrained implementation mechanisms.[7,8] The most significant

[5] One of the reviewers pointed out that a comprehensive assessment of Australia's climate change vulnerability has been commissioned by the Australian Greenhouse Office of the Department of the Environment and Heritage, two years before the National Climate Change Adaptation Framework was published (Australian Greenhouse Office, 2005). Remarkably, this assessment was neither mentioned by the interviewees, nor referred to in the adaptation framework itself.

[6] Based on the 2008 Climate Change Act, the UK Government is required to deliver a new risk assessment to Parliament every five years (Warren et al., 2018).

[7] For an in-depth analysis of the integration of climate change adaptation into sectoral policy-making, see Russel et al., 2018.

[8] fluence of the EU's adapta-

In recent years, we have seen an increased in tion strategy on national adaptation strategies (see e.g., Bauer and Steurer, 2015). However, we cannot provide a serious assessment of this influence

difference between adaptation strategies at different levels of government can be summarized as follows: while most strategies are rather vague with regard to goals and measures, a few provide details on what to do until when and where. Unfortunately, we cannot say that the latter has significant advantages in implementing adaptation. This brings us back to our research questions.

Under which conditions are comprehensive adaptation strategies likely to facilitate adaptation in sectors affected by climate change? Since adaptation strategies are weak coordination tools that are unable to force adaptation onto sectoral policy agendas, they rely first and foremost on sectoral self-interests. Fortunately, adapting to climate change is most often in the self-interest of a sector (whereas mitigation has the characteristics of a tragedy of the commons). However, if sectoral policy-makers do not see the need for adaptation, those responsible for respective strategies can only raise sectoral awareness for potential climate change impacts (e.g., via commissioning and communicating research) and provide incentives (such as subsidies for adaptation projects). However, since most adaptation strategies do not have funding to distribute, they are usually "downgraded" from coordination to communication tools (see also Casado-Asensio and Steurer, 2014). That said we rephrase our first research question as follows: what factors determine sectoral interest in adaptation? In this regard, framework conditions, such as problem pressure, play far more important roles than any other factors or conditions addressed above. If a sector has experienced climate change impacts (or is certain to experience them in the near future), it is more likely to mainstream adaptation into its policies than those who lack this immediate concern (see also Amundsen et al., 2010; Bauer and Steurer, 2015). Neither actor constellations nor governance arrangements come close to the importance of problem pressure (perhaps also because we did not find viable mechanisms of horizontal or vertical policy coordination). Nevertheless, active

and convincing change agents can make a difference: they can raise awareness for climate change impacts that are expected in the future, and sometimes they can even mobilize funds.

To what degree and how can the conditions of policy change identified above be shaped by policy-makers? Based on the answer given to our first question, we have to differentiate between those responsible for an adaptation strategy and policy-makers responsible for implementing sectoral adaptation policies. As indicated above, the former is eager to shape conditions in favour of climate change adaptation, but their leeway is severely limited, mainly because they depend on sectoral actors. Apart from raising awareness and providing fiscal incentives for adaptation, they can promote attractive policy solutions (in particular with win-win or no-regret characteristics) that align well with sectoral interests and routines, so that they can gain traction once a policy window for adaptation opens (e.g., due to an extreme weather event). On the other hand, sectoral actors are usually not interested in adaptation as long as a problem is inconceivable and/or uncertain. They could shape several conditions in favour of adaptation, but why should they if they doubt there is or will be a negative impact? The only exception to this "rule" among our cases can be found in the Netherlands: here, national and regional actors focused their adaptation efforts on water management early on, and respective policy-makers have fully embraced the challenge, mainly because large parts of the country are threatened by the undoubted sea-level rise. This example emphasizes that even anticipatory adaptation does not depend on a cross-sectoral adaptation strategy, the governance approach that has been promoted as a onesize-fits-all solution to adaptation in recent years, in particular in Europe (Bauer and Steurer, 2015).

Although adaptation strategies at whatever level of government have obviously limited effects on actual policymaking (see also Casado-Asensio and Steurer, 2014), this does not mean that adaptation policies make no progress in the regions, countries, and cities examined here. Adaptation policies are put in place at various levels, as documented in the scholarly literature (e.g., Persson and Runhaar, 2018; Runhaar et al., 2018), in the EEA's report on "Adaptation in Europe" (EEA, 2013) and online at the European Climate Adaptation Platform.[9] But how do these

[9] https://climate-adapt.eea.europa.eu/data-and-downloads (accessed 8 November 2018).

extensive documentations of adaptation measures corroborate with our findings? First, they confirm the extensive proliferation of adaptation strategies and plans at all levels of government: several of the documented "measures" are (additional) policy programmes and plans such as Copenhagen's Cloudburst Management Plan or the adaptation pathways for the Thames Estuary (EEA, 2013), and not concrete adaptation measures that have actually been implemented on the ground. Second, they implicitly acknowledge the limited relevance of adaptation strategies because most documented adaptation policies that have been implemented were not explicitly mentioned in respective adaptation strategies (sometimes because the former predate the latter). For example, this applies to the TE 2100 project in London (EEA, 2013), or the Dutch programme "Building with Nature" (EEA, 2013). In short: adaptation does make progress, but the overall links between comprehensive adaptation strategies and adaptation actions on the ground are weak (see also Casado-Asensio and Steurer, 2014).[10] When different levels of government address adaptation in very similar ways (i.e., with cross-sectoral adaptation strategies), it does not come as a surprise that most of them struggle with very similar problems. As shown above, these problems touch more on political issues (such as problem pressure and public opinion) than on administrative or governance features (such as how a strategy document is formulated or how its governance is organized; see also Biesbroek et al., 2014). Since neither complex problems (such as climate change) nor political issues (such as problem pressure) can be addressed easily with one-sizefits-all approaches (such as adaptation strategies), more diverse, sometimes even experimental forms of adaptation governance (Bulkeley et al., 2015), may have the potential to deliver tailored-made approaches we missed in the empirical material presented here.

[10] because the national adaptation strategies that we examined have all been published earlier than the EU adaptation strategy and during the time period we examined the influence was only informal.

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References

Adger, N., Arnell, N.W., Tompkins, E.L., 2005. Successful adaptation to climate change across scales. Global Environmental Change, 15 (2): 77–86.

Amaru, S., Chhetri, N.B., 2013. Climate adaptation: Institutional response to environmental constraints, and the need for increased flexibility, participation, and integration of approaches. Applied Geography, 39 (1): 128–139.

Amundsen, H., Berglund, F., Westkog, H., 2010. Overcoming barriers to climate change adaptation – A question of multilevel governance? Environment and Planning C: Government and Policy, 28(2): 276–289.

Arens, S., 2012. Anpassung an den Klimawandel. Planungsansätze regionaler Entwicklungsstrategien im Vergleich; Wuppertal Studienarbeiten zur nachhaltigen Entwicklung, Nr.5, Juli 2012; Wuppertal Institut für Klima, Umwelt, Energie, Wuppertal.

Atkinson, M.M., Coleman, W.D., 1992. Policy networks, policy communities and the problems of governance. Governance, 5(2): 154–180.

Bauer, A., Feichtinger, J., Steurer, R., 2012. The governance of climate change adaptation in 10 OECD countries: Challenges and approaches. Journal of Environmental Policy and Planning, 14(3): 279–304.

Bauer, A., Steurer, R., 2015. National adaptation strategies, what else? Comparing adaptation mainstreaming in German and Dutch water management. Regional Environmental Change, 15(2): 341–352.

Baumgartner, F.R., 2013. Ideas and policy change. Governance, 26(2): 239–258.

Bauriedl, S., 2011. Rahmenbedingungen und Herausforderungen einer regionalen Klimawandel-Governance: Praxisbericht der

KLIMZUGModellregion Nordhessen. Cormont., Frank: Governance in der Klimaanpassung - Strukturen, Prozesse, Interaktionen. Dokumentation der Tagung der KLIMZUG-Verbünde an der TU Dortmund; pp. 8–16.

Beck, S., Kuhlike. C., Görg, C., 2009. Climate policy integration and governance in Germany. PEER Climate Change Initiative – Project 2: "Climate Policy Integration, Coherence and Governance", UFZBericht 01/2009. Helmholtz-Zentrum für Umweltforschung.

Berkes, F., 2009. Evolution of co-management: Role of knowledge generation, bridging organizations and social learning. Journal of Environmental Management, 90(5): 1692–1702.

Biermann, F., Siebenhüner, B. (Eds.), 2009. Managers of Global Change. Explaining the Influence of International Environmental Bureaucracies. MIT Press, Cambridge, MA.

Biesbroek, R., Klostermann, J., Termeer, C., Kabat, P., 2011. Barriers to climate change adaptation in the Netherlands. Climate Law, 2(2): 181–199.

Biesbroek, R., Swart, R.J., Carter, T.R., Cowan, C., Henrichs, T., Mela, H., Morecroft, M.D., Rey, D., 2010. Europe adapts to climate change: Comparing national adaptation strategies. Global Environmental Change, 20(3): 440–450.

Biesbroek, G.R., Termeer, C.J.A.M., Klostermann, J.E.M., Kabat, P., 2014. Analytical lenses on barriers in the governance of climate change adaptation. Mitigation and Adaptation Strategies for Global Change, 19(7): 1011–1032.

Brouwer, S., Rayner, T., Huitema, D., 2013. Mainstreaming climate policy: The case of climate adaptation and the implementation of EU water policy. Environment and Planning C: Government and Policy, 31(1): 134–153.

Bulkeley, H., Broto, V.C., Edwards, G.A.S., 2015. An Urban Politics of Climate Change. Experimentation and the Governing of Sociotechnical Transitions. Routledge, London.

Casado-Asensio, J., Steurer, R., 2014. Integrated strategies on sustainable development, climate change mitigation and adaptation in Western Europe: Communication rather than coordination. Journal of Public Policy, 34(03): 437–473.

CBSS Council of the Baltic Sea Regions, 2013. BaltAdaptStrategy for adaptation to climate change in the Baltic Sea Region.

Clar, C., 2019. Coordinating climate change adaptation across levels of government: The gap between theory and practice of integrated adaptation strategy processes. Journal of Environmental Planning and Management, https://www.tandfonline.com/doi/full/10.1080/09640568.2018.1536604

Clar, C., Prutsch, A., Steurer, R., 2013. Barriers and guidelines for public policies on climate change adaptation: A missed opportunity of scientific knowledge-brokerage. Natural Resources Forum, 37(1): 1–18.

Coleman, W.D., Skogstad, G. (Eds.), 1990. Policy Communities and Public Policy in Canada. Copp Clark Pitman, Toronto.

Collins, K., Ison, R., 2009a. Editorial: Living with environmental change: Adaptation as social learning. Environmental Policy and Governance, 19(6): 351–357.

Collins, K., Ison, R., 2009b. Jumping off Arnstein's ladder: Social learning as a new policy paradigm for climate change adaptation. Environmental Policy and Governance, 19(6): 358–373.

Dannevig, H., Rauken, T., Hovelsrud, G., 2012. Implementing adaptation to climate change at the local level. Local Environment, 17(6–7): 597–611.

Dewulf, A., Meijerink, S., Runhaar, H., 2015a. Editorial: The governance of adaptation to climate change as a multi-level, multi-sector and multi-actor challenge: A European comparative perspective. Journal of Water and Climate Change, 6(1): 1–8.

Dewulf, A., Meijerink, S., Runhaar, H., 2015b. The governance of adaptation to climate change: A European comparative perspective. Journal of Water and Climate Change, 6(1).

Dovers, S.R., Hezri, A.A., 2010. Institutions and policy processes: The means to the ends of adaptation. Wiley Interdisciplinary Reviews: Climate Change, 1(2): 212–231.

EEA (European Environment Agency), 2013. Adaptation in Europe. Addressing risks and opportunities from climate change in the context of socio-economic developments; EEA Report, No 3/2013, EEA, Copenhagen.

Fichter, K., von Gleich, A., Pfirem, R., Siebenhüner, B., (Eds.), 2010. Theoretische Grundlagen für erfolgreiche Klimaanpassungsstrategien; nordwest2050 Berichte Heft 1; Projektkonsortium "nordwest2050", Bremen/Oldenburg

Flanagan, K., Uyarra, E., Laranja, M., 2011. Reconceptualising the 'policy mix' for innovation. Research Policy, 40(5): 702–713.

Füssel, H.M., 2007. Adaptation planning for climate change: Concepts, assessment approaches, and key lessons. Sustainability Science, 2(2): 265–275.

Grin, J., Rotmans, J., Schot, J., 2010. Transitions to Sustainable Development. New Directions in the Study of Long Term Transformative Change. Routledge, London.

Hall, P., 1993. Policy paradigms, social learning, and the state: The case of economic policymaking in Britain. Comparative Politics, 25: 275–296.

Hallegatte, S., 2009. Strategies to adapt to an uncertain climate change. Global Environmental Change, 19(2): 240–247.

Hermann, A.T., Pregernig, M., Hogl, K., Bauer, A., 2015. Cultural imprints on scientific policy advice: Climate science–policy interactions within Austrian neo-corporatism. Environmental Policy and Governance, 25(5): 343–355.

Jänicke, M. (Ed.), 1996. Umweltpolitk der Industrieländer. Entwicklung – Bilanz – Erfolgsbedingungen. Ed. Sigma, Berlin.

Jänicke, M., Weidner, H., 1995. Successful Environmental Policy. A Critical Evaluation of 24 Cases. Wissenschaftszentrum Berlin für Sozialforschung, Ed. Sigma, Berlin.

Jordan, A., van Asselt, H., Berkhout, F., Huitema, D., Rayner, T., 2012. Understanding the paradoxes of multilevel governing: Climate change policy in the European Union. Global Environmental Politics, 12 (2): 43–66.

Kabat, P., van Vierssen, W., Veraart, J., Vellinga, J., Aerts, J., 2005. Climate proofing the Netherlands. Nature, 438: 283–284.

Karlstetter, N., Fichter, K., Pfriem, R., 2010. Evolutorische Grundlagen. In: Fichter, K., von Gleich, A., Pfriem, R., Siebenhüner, B. (Eds.), Theoretische Grundlagen für erfolgreiche Klimaanpassungsstrategien. northwest2050, Bremen. pp. 70–100.

Kingdon, J.W., 1984. Agendas, Alternatives and Public Policies. Little, Brown, Boston.

Knox-Hayes, J., 2012. Negotiating climate legislation: Policy path dependence and coalition stabilization. Regulation & Governance, 6(4): 545–567.

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This becomes particularly apparent at the EU level, where the legal and political requirement of EU member states to adopt climate change adaptation measures (see for instance Article 8 of the Regulation EU 1303/2013 laying down common and general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund; https://ec.europa.eu/digital-singlemarket/en/news/regulation-eu-no-13032013-european-parliament-andcouncil (accessed 28 November2018) is not in any way directly connected to the EU adaptation strategy

Kristof, K., 2010. Wege zum Wandel. Wie wir gesellschaftliche Veränderungen erfolgreicher gestalten können. Oekom Verlag, München.

Leach, M., Bloom, G., Ely, A., Nightingale, P., Scoones, I., Sha, E., Smith, A., 2007a. Understanding governance: Pathways to sustainability; STEPS Working Paper 2, STEPS Centre, Brighton.

Leach, M., Scoones, I., Sterling, A., 2007b. Pathways to sustainability: An overview of the STEPS Centre approach; STEPS Approach Paper, STEPS Centre, Brighton.

McEvoy, D., Fünfgeld, H., Bosomworth, K., 2013. Resilience and climate change adaptation: The importance of framing. Planning Practice and Research, 28(3): 280–293.

Mintrom, M., Luetjens, J., 2017. Policy entrepreneurs and problem framing: The case of climate change. Environment and Planning C: Politics and Space, 35(8): 1343–1361.

Moser, S.C., Ekstrom, J.A., 2010. A framework to diagnose barriers to climate change adaptation. Proceedings of the National Academy of Sciences of the United States of America, 107(51): 22026–22031.

Noble, I.R., Huq, S., Anokhin, Y.A., Carmin, J., Goudou, D., Lansigan, F.P., Osman-Elasha, B., Villamizar, A., 2014. Adaptation Needs and Options. Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge.

Nordbeck, R., Steurer, R., 2016. Multi-sectoral strategies as dead ends of policy integration: Lessons to be learned from sustainable development. Environment and Planning C: Government and Policy, 34(4): 737–755.

Pahl-Wostl, C., Craps, M., Dewulf, A., Mostert, E., Tabara, D., Taillieu, T., 2007. Social learning and water resources management. Ecology and Society, 12(5). Available at http://www.ecologyandsociety.org/vol12/iss2/art5/ (accessed 8 February 2019).

Persson, Å., 2004. Environmental policy integration: An introduction; PINTS – Policy integration for sustainability. Background Paper, SEI Stockholm Environment Institute.

Persson, Å., Runhaar, H., 2018. Conclusion: Drawing lessons for Environmental Policy Integration and prospects for future research. Environmental Science and Policy, 85: 141–145.

Pittcock, J., 2011. National climate change policies and sustainable water management: Conflicts and synergies. Ecology and Society, 16(2): 25. Available at http://www.ecologyandsociety.org/vol16/iss2/art25/ (accessed 8 February 2019).

Pollack, M.A., Hafner-Burton, E.M., 2010. Mainstreaming international governance: The environment, gender, and IO performance in the European Union. The Review of International Organizations, 5: 285–313.

Preston, B., Westaway, R., Yuen, E., 2011. Climate adaptation planning in practice: An evaluation of adaptation plans from three developed nations. Mitigation and Adaptation Strategies for Global Change, 16 (4): 407–438.

Runhaar, H., Wilk, B., Persson, Å., Uittenbroek, C., Wamsler, C., 2018. Mainstreaming climate adaptation: Taking stock about 'what works' from empirical research worldwide. Regional Environmental Change, 18(4): 1201–1210.

Russel, D.J., Uyl, R.M., Vito, L., 2018. Understanding policy integration in the EU – Insights from a multi-level lens on climate adaptation and the EU's coastal and marine policy. Environmental Science and Policy, 82: 44–51.

Sabatier, P.A., 1993. Advocacy-koalitionen, policy wandel und policyLernen: Eine Alternative zur Phasenheuristik. Kritik und Neuorientierung. Politische Vierteljahresschrift, 34(24): 116–148.

Sharman, A., Holmes, J., 2010. Evidence-based policy or policy-based evidence gathering? Biofuels, the EU and the 10% target. Environmental Policy and Governance, 20(5): 309–321.

Skodvin, T., Gullberg, A.T., Aakre, S., 2010. Target-group influence and political feasibility: The case of climate policy design in Europe. Journal of Public Policy, 17(6): 854–873.

Skogstad, G., 2005. Policy networks and policy communities: Conceptual evolution and governing realities. Paper prepared for the Workshop on "Canada's Contribution to Comparative Theorizing", Annual Meeting of the Canadian Political Science Association, London, Ontario.

Sommer, B., Schad, M., 2014. Change agents für den städtischen klimaschutz. Empirische befunde und praxistheoretische einsichten. GAIA, 23(1): 48–54.

Späth, P., Rohracher, H., 2009. Climate change and regional governance: Towards robust procedures of negotiation and planning. Available at http://academia.edu/858890/Climate_change_and_regional_governance__Towards_robust_procedures_of_negotiation_and_planning (accessed 8 February 2019).

Steurer, R., 2008. Sustainable development strategies. In: Jordan, A., Lenschow, A. (Eds.), Innovation in Environmental Policy? Integrating the Environment for Sustainability. Edward Elgar, Cheltenham. pp. 93–113.

Termeer, C., Dewul, A., Breeman, G., 2013. Governance of wicked climate adaptation problems. In: Knieling, J., Leal Filho, W. (Eds.), Climate Change Governance. Climate Change Management. Springer, Berlin. pp. 27–39.

Tompkins, E.L., Amundsen, H., 2008. Perceptions of the effectiveness of the United Nations Framework Convention on Climate Change in advancing national action on climate change. Environmental Science & Policy, 11(1): 1–13.

Tschakert, P., Dietrich, K.A., 2010. Anticipatory learning for climate change adaptation and resilience. Ecology and Society, 15(2): 11. Available at: http://www.ecologyandsociety.org/vol15/iss2/art11/ (accessed 8 February 2019).

Tsebelis, G., 2002. Veto Players: How Political Institutions Work. Russell Sage Foundation and Princeton University Press, New York and Princeton, New Jersey.

Urwin, K., Jordan, A., 2008. Does public policy support or undermine climate change adaptation? Exploring policy interplay across different scales of governance. Global Environmental Change, 18(1): 180–191.

Warren, R.F., Wilby, R.L., Brown, K., Watkiss, P., Betts, R.A., Murphy, J.M., Lowe, J.A., 2018. Advancing national climate change risk assessment to deliver national adaptation plans. Philosophical Transactions of the Royal Society A, 376(2121): 20170295.

Weible, C.M., Sabatier, P.A., McQueen, K., 2009. Themes and variations: Taking stock of the advocacy coalition framework. The Policy Studies Journal, 37(1): 121–140.

Widmer, A., 2018. Mainstreaming climate adaptation in Switzerland: How the national adaptation strategy is implemented differently across sectors. Environmental Science and Policy, 82: 71–78. Yin, R.K., 2003. Case Study Research: Design and Methods, 3rd edn (Vol. 5). Sage, Thousand Oaks, CA.