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Domestic politics and the diffusion of international policy innovations: How does accommodation happen?

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ABSTRACT

What happens to policy innovations after they have been adopted? What factors account for subsequent changes to these policies? These are the research questions guiding this study on the spread of and subsequent changes to limit values for nitrogen oxide emissions from large combustion plants. By comparing the processes of diffusion and follow-up policy changes, we assess whether and how policy innovations translate into policy making. In so doing, we build on the literature on the determinants of policy diffusion and transfer. We employ original data on instances of policy adoption and policy change in 24 Organisation for Economic Co-operation and Development (OECD) countries over a period of thirty years (1976–2005). The data are analysed using semi-parametric event-history models. Our empirical findings show that both international and domestic factors account for the observed variation in our data regarding both first-time adoptions and post-adoption modifications. The results reveal that the subsequent tightening of emission standards faces greater obstacles than their mere diffusion (i.e., policy adoption). While international factors and supranational integration appear to impede the subsequent tightening of existing policies, international peer pressure is a strong predictor of an on-going regulatory commitment. Overall, adoption and accommodation processes seem to follow distinctive patterns, suggesting that a promising strategy in policy innovation research would involve differentiation between the first-time adoption and subsequent modification of policies.

1. Introduction

Public policy innovations and their diffusion from one jurisdiction to another have become the focus of increasing scientific attention. The push for the adoption of a new public policy can either come from domestic actors or from actors outside the polity, such as other jurisdictions or international organisations (Shipan and Volden, 2008, p. 841). In this context, a growing number of studies in recent years have examined multilateral environmental agreements and their ratification (see, e.g., Neumayer, 2002; Bernhagen, 2008; Bernauer et al., 2013; Schulze and Tosun, 2013). At the same time, a rich body of literature on the diffusion of environmental policy instruments has emerged (see, e.g., Frank et al., 2000; Tews et al., 2003; Holzinger et al., 2008; Huber, 2008). Within this body of research, several empirical studies have explicitly addressed the diffusion of climate policy innovations (see, e.g., Jordan and Lenschow, 2008; Mickwitz et al., 2009; Jordan et al., 2010; for an overview, see Dupuis and Biesbroek, 2013). Considering that climate change policy is a comparatively young policy field that only emerged in the 1990s (Huitema et al., 2011, p. 193), this development is remarkable.

Despite the size of the literature, only a few studies have attempted to explore how policy innovations promoted by international organisations have been accommodated within domestic systems (see, e.g., Biesbroek et al., 2010). We conceive of policy accommodation as a process of adapting a policy innovation to a domestic institutional and policy context, which may entail changes to the policy design originally promoted by an international organisation (for a different definition, see, e.g., Walker, 1969). In the wider literature on policy change, there have been some attempts to explore these post-adoption dynamics (see, e.g., Howlett and Joshi-Koop, 2011; for an assessment of the current gaps in the literature, see Jordan and Huitema, forthcoming). However, empirical studies of diffusion processes tend to focus on the adoption of policy instruments and do not provide insights into whether and how these policy innovations are

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subsequently modified by domestic policy makers. To close this gap, we focus on both adoption of international policies and their domestic post-adoption change.

To put it simply, while most *diffusion* studies tend to exclusively focus on the *spread and adoption* of policy innovations, we explicitly investigate both the *spread and adoption* of policy innovations and what happens to the policies *after* the point of adoption. Our analysis is guided by two research questions: Does the accommodation process for policy innovations entail changes to the original policy design? What domestic factors trigger such changes?

We argue that continuous or increasing environmental problem pressure requires policy makers to constantly adjust existing policies. Failure to do so might entail the actual dismantling of regulation in a changing environment (see Bauer et al., 2012; Knill et al., 2012; Jordan et al., 2013) – a precursor of the entire abolishment of policies or policy instruments (Ragusa, 2010). Therefore, we analyse the circumstances under which policy makers pursue a certain regulatory approach even after policy adoption to gather systematic evidence of post-adoption dynamics. In this context, particular emphasis will be placed on disentangling the various international, transnational, and national determinants and on assessing the role of international organisations in diffusion and accommodation processes (see also, e.g., Shipan and Volden, 2008; De Francesco, 2012; Jordan and Huitema, forthcoming; Massey and Biesbroek, 2014; Stadelmann and Castro, 2014).

To evaluate our research questions, we employ an original dataset providing information on instances of policy change in 24 OECD countries over a period of three decades (1976–2005). Although this dataset includes a large number of policy items, we focus here on the adoption (i.e., policy diffusion) and subsequent changes (i.e., policy accommodation) of limit values for nitrogen oxide (NO_x) emissions from large combustion plants. NO_x emissions represent an important group of air pollutants; these emissions were addressed by the Long-range Transboundary Air Pollution Convention of 1979. In 1988, the Protocol concerning the Control of Emissions of NO_x or their Transboundary Fluxes was adopted. This NO_x Protocol is of principal interest for our analysis. It requires a freeze on emissions of NO_x or their transboundary fluxes and the adoption of an effects-based approach that involves a further reduction in the emissions of NO_x. Because the Convention on Long-range Transboundary Air Pollution was negotiated under the auspices of and is administered by the United Nations Economic Commission for Europe (see Schulze and Tosun, 2013), it meets our criteria for a policy innovation promoted by an international organisation.

The remainder of this article consists of four main parts. We first describe the theoretical considerations related to cross-national policy diffusion and post-adoption policy adaptation informing the empirical analysis. We then turn to a presentation of the measurement of and data for the variables. In the third part, we present the findings of the empirical analysis and explain for which of our hypotheses we find support. Finally, we discuss the most important findings and make some concluding remarks that generalise beyond the research questions addressed here.

2. Diffusion and accommodation of policy innovations: theoretical considerations

Diffusion is generally defined as the socially mediated spread of policies across and within political systems, including communication and learning processes across and within populations of adopters (Rogers, 2003; see also Holzinger and Knill, 2005; Braun and Gilardi, 2006; Holzinger et al., 2008; Gilardi, 2012; Maggetti and Gilardi, 2014; Jordan and Huitema, forthcoming). A compelling example of a policy innovation is the spread of reforms that seek to open up national economies and reduce the economic role of the state through privatisation and deregulation (Meseguer, 2005, p. 69; for an overview, see Graham et al., 2008). Although diffusion studies address a wide range of policy innovations, they all share the assumption that policy making in one country affects the likelihood of policy making in other countries (Braun and Gilardi, 2006; Jahn, 2006; Jordana et al., 2011; De Francesco, 2012; Gilardi, 2012). Furthermore, diffusion studies resemble each other in terms of analytical procedures. In their first step, diffusion studies typically start with a description of adoption patterns, based on the cumulative number of countries that have adopted a given policy by a time *t*. In most cases, this produces an S-shaped curve, implying that adoption rises slowly at first, when relatively few governments are introducing the policy. The curve then becomes much steeper as more governments adopt the measure. After a while, however, most governments will have adopted the policy, and the diffusion curve begins to level off (Gray, 1973).

In the second step, diffusion scholars pose the following two research questions: Why do countries adopt certain policies? How can the varying pace of policy adoption be explained? Scholarly attention is thus predominantly focused on the mechanisms of policy diffusion, often involving considerations of the roles of transnational learning, regulatory competition, conditionality and imposition, harmonisation, and transfer (see, e.g., Tews et al., 2003; Holzinger and Knill, 2005; Meseguer, 2005; Braun and Gilardi, 2006; Jahn, 2006; Gilardi, 2008, 2012; Shipan and Volden, 2008; Knill and Tosun, 2009; Jordana et al., 2011; De Francesco, 2012; Maggetti and Gilardi, 2014).

Although these studies have certainly provided many insights into the forces triggering or impeding policy diffusion, we observe one general shortcoming with this literature (see Jordan and Huitema, forthcoming): there is an exclusive focus on the first-time adoption of policy innovations (Berry et al., 2010; Ragusa, 2010; Jordan et al., 2013). As a result, it is difficult to derive theoretical expectations from the literature concerning whether and how policy innovations that were promoted by international organisations are subsequently modified by domestic policy makers. These follow-up decisions – which we refer to as policy accommodation – include both the tightening and weakening of provisions as well as decisions not to alter policies at all. From this, it follows that a new theoretical framework is required in order to explain how policy innovations originating from the international arena are incorporated into national political systems. Thus, the basic question arises, to which degree diffusion processes differ between first-time and follow-up decisions and whether these decisions are subject to specific diffusion mechanisms. For a systematic comparison, we test the degree to which different diffusion mechanisms account for the spread of first-time adoptions and follow-up decisions.

We identify four types of diffusion mechanisms and two mediating domestic factors, which culminate in eleven hypotheses that are tested in the following sections. The four mechanisms concur with the distinct theories to explain the diffusion of policies across countries identified by Dobbin et al. (2007): learning, emulation, coercion, and economic competition. These diffusion mechanisms concentrate on the international context. In accordance with insights provided by Lenschow et al. (2005), Tews (2005), Graham et al. (2008), Howlett and Joshi-Koop (2011) and Gilardi (2012), we argue that both policy adoption and accommodation can be considered to be subject to domestic politics as well. To this end, we identify two mediating factors that are effective at the domestic level: the political opportunity structure and public demand.

Before turning to the hypotheses, a few explanations should be given about the formulation of the theoretical expectations. All hypotheses except for the one on the learning mechanism put

forward expectations for both the adoption and the accommodation of policy innovations. We expect learning to be effective for the adoption of a policy innovation only and not for the subsequent adjustments. This expectation is derived from the idea that once a policy is in place it will generate losers and winners (see Bauer et al., 2012; Jordan et al., 2013); the latter may exert their influence to preserve the status quo. Given the inertial character of policies, we assume that the mere supply of new technical information by means of transnational communication is unlikely to be sufficient for determining how the policy becomes accommodated, thereby impeding learning processes.

2.1. Learning

We begin with the mechanism of learning, which we conceive as the process of changing preferences due to the availability of social knowledge (see Haas, 1980). As stated in the introductory section, policy innovations are typically based on comprehensive scientific evidence and should therefore represent the 'best possible option' in light of the characteristics of the respective policy problem and the state of technology available to address the problem. Following this reasoning "policy innovation spreads in the wake of the diffusion of a shared fund of (often technical) knowledge among elites about what is effective" (Dobbin et al., 2007, p. 460). In other words, a government that adopts a given policy innovation likely regards it as an appropriate solution to the policy problem in question (Gilardi, 2008, p. 72). Instead of embarking on a costly search for appropriate solutions at the national level, governments rely on the solutions recommended by international organisations. We argue that the Convention on Long-range Transboundary Air Pollution and its follow-up protocols have helped to increase technical knowledge about limiting and preventing long-range transboundary air pollution through triggering the regulation of the discharge of air pollutants. In this way, the Convention and the protocols have been instrumental for triggering learning. We associate the signing of the Convention with the comparatively soft diffusion mechanism of learning since membership predominantly entails the exchange of information and communication of research and best practices.

H1 (Policy Innovation Adoption through Learning).
Policy adoption in the field of air pollution is likely to occur when a nation-state is a signatory of the Convention on Long-range Transboundary Air Pollution or the NO_x Protocol of the Convention.

2.2. Emulation

The second mechanism is based on the idea that policy diffusion is related to the notion of social acceptance (Dobbin et al., 2007, p. 452). There exist different ways in which a policy innovation can become socially accepted. We here focus on the process of emulation, which is about policy makers in one country who follow the behaviour of policy makers in another country because they are peers or because they are regarded as "high-status countries that are considered to know best" (Meseguer, 2005, p. 73). The drive behind emulation is the search for social acceptance by demonstrating conformity with the behaviour of other states and 'not to be left behind' (see, e.g., Finnemore, 1996; Meyer et al., 1997; Holzinger and Knill, 2005; Braun and Gilardi, 2006; Graham et al., 2008). The reasoning underlying emulation is particularly convincing with regard to policy innovations that involve a high degree of uncertainty in terms of short- or medium-term regulatory costs and long-term benefits (see Berkhout et al., 2010, pp. 216–217).

Since it is methodologically challenging to determine which country is perceived as 'high-status' or 'bench marker', we restrict ourselves to the analysis of the effect of peer states. By this, we mean countries that share certain characteristics with each other or that are in geographical proximity. Therefore, we expect emulation to be effective among European Union (EU) member states as well as states that share borders as spelled out in hypotheses H2a and H2b.

H2 (Policy Innovation Adoption and Accommodation through Emulation).
H2a: Both policy adoption and accommodation in the field of air pollution in one country are likely to occur when other countries with a common border have adopted or made changes to their regulation of NO_x emissions from large combustion plants.

H2b: Both policy adoption and accommodation in the field of air pollution are likely to occur when other EU member states have adopted or made changes to their regulation of NO_x emissions from large combustion plants.

2.3. Coercion

The next mechanism to which we turn to is coercion, which can basically be defined as a situation in which policy choices of countries are constrained. Dobbin et al. (2007, pp. 454–457) discuss coercion by referring to the concepts of conditionality, policy leadership, and hegemonic ideas. Our take on coercion deviates from this reasoning for we are predominantly interested in how supranational integration in the EU affects the adoption and accommodation of policy innovations. In our view, supranational harmonisation can be compared to other coercive instruments since member states must comply with EU rules. The policy behaviour of member states is monitored and there exist instruments to penalise non-compliance with EU rules (see, e.g., Selin and Deveer, 2003; Holzinger and Knill, 2005; Holzinger et al., 2008; Oberthür and Tänzler, 2007; Knill and Tosun, 2009; Tosun, 2012). In this way, supranational law can trigger EU member states both to adopt and to adjust policy innovations.

At the EU level, Council Directive 88/609/EEC first introduced harmonised limit values for NO_x emissions. The European legal provisions were later modified by Directives 94/66/EC and 2001/80/EC. It is important to note that these directives refer directly to the Convention on Long-range Transboundary Air Pollution. In addition to the European legal provisions directly targeting NO_x emissions from large combustion plants, the EU has also adopted a number of secondary legal acts to combat air pollution that may have implications for NO_x emissions. Based on these considerations, it follows that the EU member states in particular are exposed to intense pressure to adopt limit values for NO_x emissions from large combustion plants and to adjust them in accordance with EU requirements.

H3 (Policy Innovation Adoption and Accommodation through Supranational Harmonisation).
H3a: Both policy adoption and accommodation in the field of air pollution are likely to occur when a nation-state is subject to harmonisation as a consequence of relevant EU directives.

H3b: Both policy adoption and accommodation in the field of air pollution are likely to occur when changes are made to the EU secondary legislation on clean air.

2.4. Economic competition

The fourth mechanism highlights the importance of economic competition for the diffusion of policy innovations. The logic underlying this mechanism is that the competition for trade and investment affects the incentives for policy makers for whether or

not to adopt and subsequently modify policy innovations, especially if these are expected to affect the national industry's ability to compete on the global market (see Dobbin et al., 2007, p. 457). Several empirical studies point to the relevance of trade for policy diffusion (see, e.g., Andonova et al., 2007; Holzinger et al., 2008; Cao and Prakash, 2012; Schulze and Tosun, 2013). In light of this literature, we mainly focus on the openness of a country's markets and expect that the degree of economic openness may explain whether or not policy innovations are adopted and how they become accommodated. We argue that the degree of economic openness is appropriate for assessing which priority governments give to competitive concerns when making policy choices. The more open an economy is the less likely we expect it to adopt and subsequently tighten NO_x emission standards, all else being equal. Yet, economic competition also involves competition for inward investment. We suggest that economies that are highly dependent on inward investment are less committed to pass or maintain tight environmental standards. In fact, policy makers may seek to attract industries by offering them comparatively weaker environmental standards (see, e.g., Spatareanu, 2007).

H4 (Policy Innovation Adoption and Accommodation through Economic Competition).

H4a: Both policy adoption and accommodation in the field of air pollution are less likely to occur when the economy of a country becomes more open.

H4b: Both policy adoption and accommodation in the field of air pollution are less likely to occur when the inward investments rise.

2.5. Opportunity structure

We now turn to the discussion of the domestic factors that interact with and mediate the effects of the international mechanisms of learning, emulation, coercion, and economic competition. The first one refers to political opportunity structure. It captures how institutions function as 'filters' or conditioning factors for stimuli originating from the international context.

The electoral business cycle has been found to constitute a crucial determinant for the timing of policy decisions in the mid and long term (see, e.g., Franzese, 2002). In this context, scientists refer to the allocation of costs and benefits of certain policy decisions as well as their visibility (see, e.g., Jordan et al., 2013). Environmental regulation most times initiates dispersed benefits and concentrated costs because it usually targets select polluters (large combustion plants in this context). Office-seeking decision makers are expected to enact costly policies in the beginning of legislatures and to abstain from such steps towards the end for re-election purposes (see Cazals and Sauquet, 2013). Furthermore, the role of party politics has extensively been discussed in the literature (see, e.g., Hibbs, 1992; Burstein and Linton, 2002; Knill et al., 2010; Schulze, 2014; Tosun, 2014). There is consensus in the literature that political parties matter when it comes to the prioritisation of certain policy issues or to the direction of decisionmaking. We argue that politicians cater to their voters, thereby acting according to their party manifestos. The extent of environmental policy making is therefore determined by the prioritisation of this issue in the latest party manifestos and the degree of party representation in parliament. Our reasoning concerning the relevance of the political opportunity structure leads to hypotheses H5a and H5b.

H5 (Policy Innovation Adoption and Accommodation through Opportunity Structure).

H5a: Both policy adoption and accommodation in the field of air pollution are likely to occur when the institutional opportunity structure of a country changes.

H5b: Both policy adoption and accommodation in the field of air pollution are likely to occur when the prioritisation of environmental issues in a country's parliament increases.

2.6. Public demand

In addition to the previous set of variables, the literature suggests two more domestic factors that are expected to influence the incentives for policy makers to adopt and adjust policy innovations. These are changes in income and the degree to which a given type of environmental pollution is perceived as problematic. Together these two factors affect the level of public demand for the adoption and accommodation of policy innovations. Concerning the impact of income, we rely on the argument provided by Magnani, 2001 (p. 163) that rising income levels affect policy decisions by changing the median voter's willingness to pay for the environment. In other words, income growth may shift the median voter's preferences away from higher consumption of private goods and towards environmental quality. Turning to the impact of environmental pollution, the adoption of policy innovations and their subsequent modifications can be a response to high pollution levels (Holzinger and Knill, 2005; Holzinger et al., 2008). Hypothesis H6a refers to the impact of environmental problem pressure, whereas hypothesis H6b outlines the reasoning regarding the impact of income levels.

H6 (Policy Innovation Adoption and Accommodation through Public Demand).

H6a: Both policy adoption and accommodation in the field of air pollution are likely to occur when the environmental problem pressure in a country increases.

H6b: Both policy adoption and accommodation in the field of air pollution are likely to occur when the income level of a country changes.

3. Explanations on data and measurements

The dependent variables of this study are the introduction and the subsequent modifications of limit values for NO_x emissions from large combustion plants. The data for these variables are original and taken from the database generated by the collaborative CONSENSUS project (see also Knill et al., 2012; Bauer et al., 2012; Jordan et al., 2013). This project focuses on the policy decisions of various sub-fields of environmental and social policy in 24 OECD countries over a 30 year period (from 1976 to 2005, inclusive). The data are based on policy outputs instead of outcomes or impacts (for a discussion of the dependent variable problem in the comparative assessment of climate change adaptation policies, see Dupuis and Biesbroek, 2013; see also Schaffrin et al., forthcoming). To facilitate comparison across countries as well as across policy fields, the empirical information on policy change provided by the CONSENSUS database is coded in a binary fashion – taking the value of one in years in which change occurred and zero otherwise. These data are particularly apt for extending traditional diffusion studies by embedding an analysis of the patterns of policy adoption within a wider analysis of policy change in general.

The CONSENSUS data indicate when a country has adopted a certain instrument (i.e., a limit value). Furthermore, there is information on the timing and direction of subsequent changes in previously established limit values by means of count data. In

other words, the information allows us to assess when a particular NO_x limit value has been introduced in a country. In addition, the data provides evidence on whether and how often the limit value has been tightened. The CONSENSUS dataset usually also allows identification of instances of the relaxation of limit values. However, in the case of NO_x emissions, the limit values were never relaxed, which is already a noteworthy interim finding. Policy accommodation is thus a unidirectional process in this case and it only entails the tightening of limit values.

The concepts of interest are measured as binary variables (introduction of limit values and tightening of limit values). The two dependent variables are analysed by means of stratified semi-parametric event-history techniques (i.e., Cox regressions). In this way, we study the occurrence of an event but not its degree: the event-history analysis allows us to identify when policy makers decided to tighten NO_x emission standards, but not to what extent. Given the data structure, the semi-parametric approach is particularly useful because the model does not expect time to have a specific impact on the likelihood of policy making. Rather, it is a means of ordering the observations (i.e., the instances of policy adoption; for details, see Box-Steffensmeier and Jones, 2004; in addition, Table A.2 in Appendix reports the test statistics based on Schoenfeld residuals in order to test whether the proportional hazards assumption holds for two of the regression models).

As indicated above, information on our dependent variables and some of our explanatory variables are taken from the CONSENSUS project. We also drew on databases made available by the United Nations Conference on Trade and Development (UNCTAD), the OECD, the World Development Indicators (WDI), the Comparative Manifestos Project (CMP; Budge et al., 2001; Klingemann et al., 2006; Volkens et al., 2011), and Armingeon et al., 2011 (data set from the Comparative Political Data Set of OECD countries). Table A.1 in Appendix gives a detailed overview of the different variables, their structure, and the sources of data.

The first explanatory variable is the signing of the Convention on Long-range Transboundary Air Pollution and its follow-up protocols. It is used as a proxy for assessing if learning took place or not. Acknowledging that there are different understandings of learning in the literature (for an overview, see, e.g., Gilardi, 2012), here we conceive of learning as making use of a source of information that affects policy makers' decisions to adopt a policy or not. With the signing of the Convention, the parties commit to mutually develop policies and strategies to combat the discharge of air pollutants. To this end, the parties meet annually to review ongoing work and discuss future activities. Put differently, being a party to the Convention means that the country in question is exposed to an ongoing process of information exchange with the other parties. As argued by Holzinger and Knill (2005) and Holzinger et al. (2008) transnational communication is a necessary condition for learning, and so we use this indicator to measure learning.

The Convention is of a regional rather than global scope, currently comprising 51 European countries, including Eastern and South-Eastern Europe, the Caucasus and Central Asia as well as Canada and the United States. The limited geographic scope of the Convention has important implications for our analysis since there are five countries in the sample (i.e. Australia, Japan, Korea, Mexico, and New Zealand) that are not members of the United Nations Economic Commission for Europe. This means that these parties cannot become formal signatories of the Convention on Long-range Transboundary Air Pollution. We account for this heterogeneity in the country sample by fitting Cox regressions that are stratified for countries pertaining and those not pertaining to the United Nations Economic Commission for Europe. This approach allows us to assess to which degree membership in the United Nations Economic Commission for Europe affects the general probability for countries to regulate NO_x emissions from large combustion plants (by calculating different baseline hazards and changes thereof over time). There is an important advantage in the inclusion of countries that are not covered by the United Nations Economic Commission for Europe. This approach helps to increase variation in the data, which allows subjecting the impact of this explanatory variable to a more demanding test.

The next two explanatory variables relate to the assessment of emulation and the influence of policy adoption and change in the EU or in neighbouring countries. Here, the indicators differ with regard to their specificity. While the first one refers to policies on NO_x emission standards in EU countries only, the second reflects air policy-making activities in neighbouring countries in general. More specifically, the variable captures the number of policy decisions in the field of air pollution in neighbouring OECD countries as measured by the CONSENSUS project, which covers all changes in regulatory provisions for 21 different items (for details see also Knill et al., 2012).

To test the impact of supranational harmonisation, two explanatory variables are again employed. The first indicator assesses whether a member state is subject to Council Directive 88/609/EEC and its modifications. The second one reflects the extent of supranational decision making with regard to air pollution by reporting the annual number of EU secondary legislation in this field.

Concerning the importance of economic competition we use a variable for assessing the economic openness of countries as measured by the sum of exports and imports as a share of the Gross Domestic Product (GDP). The second variable is the inward foreign direct investment as a share of GDP.

The two explanatory variables associated with the first mediating domestic factor, political opportunity structure, are the representation of the environmental positions of political parties in a country's parliament (as provided by the CMP project) and government changes. With regard to the latter, we expect the propensity for policy making to vary over the policy cycle because elections alter political opportunity structures for decision makers. Therefore, the electoral cycle variable divides the electoral cycle into two halves. This allows us to assess the propensity for policy making for the two periods separately: for the time following elections and the period preceding elections.

Finally, public demand, the second mediating factor, is also operationalised by two indicators. Income is measured by the per capita GDP (in constant 2005 international dollars) and the indicator for problem pressure is the carbon dioxide (CO_2) emissions (in kilogrammes per 2005 PPP dollars of GDP). Note that all variables employed for the empirical analysis are time-varying, which increases our confidence in the findings.

4. Presentation of the empirical analysis

Before turning to the results of the empirical analysis, we graphically present the distribution over time of the two dependent variables and the timing of the international treaties (the Convention on Long-range Transboundary Air Pollution of 1979 and the NO_x Protocol of 1988) and the relevant EU directives (Council Directive 88/609/EEC and its modifications), as indicated by the solid and dotted lines in Fig. 1.

Fig. 1 illustrates the timing and type of policy decisions on NO_x emission standards for 24 OECD countries between 1976 and 2005. It shows that national policy-making activity concerning NO_x emission standards for large combustion plants was highest at the end of the 1980s and the beginning of the 1990s, thus following the issuance of the NO_x-related Protocol of the Convention on Long-range Transboundary Air Pollution and the EU directive on large

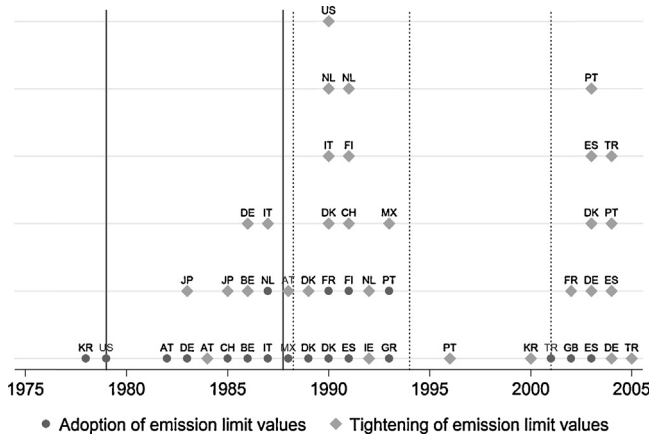

Fig. 1. NO_x emission limits values from large combustion plants in 24 OECD countries. *Remarks*: Solid line: passage of the Convention on Long-range Transboundary Air Pollution 1979 and NO_x Protocol 1988; dotted line: passage of relevant EU directives.

combustion plants. Although the first revision of that directive in 1994 did not have any visible impact on EU member states, the period between the third revision in 2001 and the end of the transposition period in 2004 was again marked by increased policy-making activity.

Now, we present the findings of the testing of the hypotheses. It is important to note that all these analyses refer to events – that is, their occurrence and their timing. As noted above, we do not consider the degree or extent of policy decisions (e.g., how many standards are simultaneously adjusted in one event). We estimate four different models for our two dependent variables (i.e., the adoption of NO_x emission limit values and the tightening of these limit values). As already indicated above, the independent variables are all lagged by one year to satisfy the minimum requirement for causality. For the first dependent variable, we fit Cox event-history models based on single failures. For the second dependent variable, we fit Cox event-history models based on repeated failures. The findings of the single-failure and repeated-failure models are comparable. The only difference is that in the case of repeated failures the observations are not dropped after the event of interest has occurred; the number of observations is thus usually greater when repeated-event models are used. This is also clearly reflected in the table presenting our results, which outlines the exponentiated coefficients and some basic test statistics.

In order to better understand the different processes, we include a comparable set of explanatory variables for each of the analyses. The regression models depicted in Table 1 (M1.1 and M1.2, as well as M2.1 and M2.2) include different models for the diffusion of policy instruments and their accommodation. The full models (M1.1 and M2.1) include variables for all the diffusion mechanisms and domestic mediating factors as outlined in the theory section above. For robustness checks, models M1.2 and M2.2 report reduced models for the two dependent variables excluding the policy learning variable. On the one hand, this allows us to assess whether the inclusive sampling of countries (regardless of their being covered by the United Nations Economic Commission for Europe or not) creates a systematic bias for the analysis. On the other hand, we are able to find out whether policy learning has different effects on instrument adoption and policy accommodation as specified in hypothesis H1.

The reported coefficients of the analyses refer to the so-called hazard ratios themselves. These indicate how a covariate changes the likelihood of the occurrence of the respective event (i.e., either policy adoption or the upward adjustment of standards). A one-unit change in the covariate alters the probability of the event by the reported factor. Factors with a value below one thus indicate a negative relationship between the covariate and the dependent variable, while the opposite is true for factors with a value higher than one.

We now turn to the substantial findings of our empirical analysis of the determinants of innovation and accommodation with regard to NO_x emission limit values. A comparison of the analyses of the two different processes reveals both similarities and striking differences. First, both processes seem to be influenced to a considerable degree by emulation and supranational harmonisation, while learning, economic competition, opportunity structures and public demand appear to be of mixed relevance. The comparison between the full models for the two processes (i.e. M1.1 and M2.1) indicates that policy learning is indeed only relevant for the diffusion of the emission standard, hence the adoption of the policy instrument. The coefficient suggests that the signature of the Convention on Long-range Transboundary Air Pollution or the relevant protocol increases the probability for the adoption of a national emission standard for large combustion plants in the subsequent year by 71 percent (see M1.1). The fact that the estimated effects for the other factors are almost identical for M1.1 and M1.2 lends further evidence to the assumption that this variable does not introduce a systematic bias to the analysis. This leads us to accept hypothesis H1.

Second, regarding the role of emulation from geographically proximate or culturally similar countries, the findings draw an interesting picture. Whereas the adoption of emission standards seems to diffuse primarily between geographical borders, the tightening of standards appears to be stimulated by both policy making in neighbouring countries and policy expansion by member states in the EU context. In other words, the decision of a neighbouring country to introduce or tighten the standard increases another country's likelihood to introduce the policy by roughly 4% (M1.1 and M1.2). Regarding the tightening of policies in turn, this probability amounts to 2.5% (M2.1 and M2.2).

With regard to the subsequent tightening of the standards, we also find evidence for processes of horizontal emulation within the EU. As models 2.1 and 2.2 show, the probability of policy accommodation increases when other EU countries make changes to their regulation of NO_x emissions from large combustion plants. The number of decisions to tighten NO_x emission limit values in EU countries has a strong and positive effect on peers, with factors of 4.4 and 4.5 (M2.1 and M2.2), respectively. This finding confirms the results of a study conducted by Matisoff and Edwards (forthcoming), who find evidence for policy learning, although it is confined to peer groups. These results also confirm hypothesis H2a on the role of neighbouring countries with regard to both the adoption and accommodation of policies. However for hypothesis H2b, the results do not reveal any impact of EU membership on the decision of countries to introduce emission standards for large combustion plants. Emulation from EU member states does however occur when it comes to the accommodation of existing standards. This finding partially confirms hypothesis H2b. In sum, emulation is important for the diffusion of both processes the adoption and tightening of emission standards for large combustion plants. While geographical proximity furthers both the adoption and tightening of the policy instrument, peer pressure (among EU countries) plays a role when it comes to the tightening of NO_x emission standards for large combustion plants.

Third, the results also provide mixed evidence for hypotheses H3a and H3b on the catalysing effect of supranational harmonisation. With respect to the diffusion of policy instruments (H3a), the passage of relevant EU directives has a strong and positive impact on a country's propensity to subsequently adopt a NO_x emission standard for large combustion plants (with a factor ranging between 8.3 and 9; see models M1.1 and M1.2). In this sense, our

Table 1
Adoption and accommodation of emission limit values (NO_x from Large Combustion Plants).

	Adoption		Accommodation	
	Model 1.1	Model 1.2	Model 2.1	Model 2.2
Policy learning				
Long-range Transboundary Air Pollution Convention signatory (binary)	1.7123***		0.0000	
	0.21		0.00	
Emulation				
Number of expansion decisions in countries with a common border	1.0425**	1.0396*	1.0247***	1.0248***
	0.02	0.02	0.01	0.01
Number of adoptions of NO_x emission limit values in other EU countries	0.9718	0.9835		
	0.34	0.35		
Number of tightenings of NO_x emission limit values in other EU countries			4.4495***	4.3565***
			1.72	1.70
Supranational harmonisation				
Transposition period EU directive (binary)	8.2892*	9.0248*	0.3248*	0.3155*
	7.88	8.72	0.14	0.15
Number of EU secondary legal acts on air policy	1.4404***	1.4446***	1.1052***	1.1078***
	0.09	0.09	0.03	0.03
Economic competition				
Exports plus imports of goods and services (% of GDP)	0.9893	0.9888	1.0074	1.0060
	0.01	0.01	0.01	0.00
Inward foreign direct investment (% of GDP)	0.4429***	0.4373***	0.9041*	0.9121
	0.08	0.08	0.04	0.05
Opportunity structure				
Period following government change (yes = 1/no = 0)	1.4597	1.3183	0.2558***	0.2559***
	0.37	0.30	0.07	0.07
Party-political support for environmental policies (CMP)	1.2696***	1.2672***	1.0746	1.0680
	0.09	0.09	0.08	0.08
Public demand				
CO_2 emissions (kg per 2005 PPP $ of GDP)	0.0317***	0.0325***	0.0543	0.0407
	0.03	0.03	0.09	0.07
GDP per capita, PPP (constant 2005 international $)	0.9576	0.9631	0.9458	0.9501
	0.04	0.04	0.03	0.03
Wald chi-squared	38.78	40.80	109.96	102.89
Prob > chi-squared	0.000	0.000	0.000	0.000
Number of cases	24	24	24	24
Number of observations	311	311	564	564

Remarks: Cox proportional hazards models (all explanatory variables lagged by one year).
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.005$.

findings confirm Stadelmann and Castro (2014), who provide empirical evidence for the positive relationship between the degree of supranational integration and a government's propensity to adopt environmental policies. However, the direction of impact is reversed when it comes to a country's willingness to tighten previously established standards. Here, national policy-making behaviour is negatively related to the degree of EU environmental legislation (M2.1 and M2.2). This finding lends credence to the interpretation that countries try to avoid moving beyond defined standards. In other words, downward pressures set in once a country moves beyond certain externally set minimum standards (see, e.g., Spar and Yoffie, 2000). Given that scholars of policy convergence in the EU have generally observed processes of upward adjustment (see, e.g., Holzinger et al., 2008), this result is surprising. It suggests that air quality standards are not as politically uncontested as has often been suggested in the literature. One (rather obvious) reason for this is that regulatory standards generally impose costs on national industry and therefore might be targeted by lobbying efforts (see, e.g., Bernhagen, 2008). So, although horizontal transfers (emulation) between EU countries seem to further the tightening of existing instruments, EU harmonisation does slow down the upward adjustment of emission standards.

In conclusion, the findings confirm Hypothesis 3a only with regard to the decision makers' ability to introduce new emission standards. Concerning the accommodation of existing policies, hypothesis H3a can be rejected. The impact of the overall extent of EU secondary legislation on clean air is more consistent when it comes to instrument adoption and accommodation (M1.1 and M1.2 as well as M2.1 and M2.2). Here we find that EU legislation on clean air is positively related to both processes. Thus, hypothesis H3b holds with respect to policy adoption and accommodation.

The results of the fourth set of observations (hypotheses H4a and H4b) provide interesting insights regarding the decision-making dynamics surrounding the two types of policy processes. While the openness of an economy does not seem to play a role for the adoption and accommodation of emission standards for large combustion plants, inward investment indeed slows down a country's willingness to regulate emissions. This finding lends credence to the assumption that countries compete for foreign investment and perceive industrial regulation as an obstacle for industrial production (compare M1.1 and 1.2 as well as M2.1 and 2.2). In sum, while hypothesis H4a (impact of foreign trade) is rejected altogether, the findings confirm hypothesis H4b (inward investment) with regard to policy adoption and to a lesser degree also regarding policy accommodation.

Fifth, we find evidence that the adoption of NO_x emission limits for large combustion plants does not depend on the electoral cycle. This is different in respects to the accommodation of existing policies. Newly elected governments seem to avoid starting out by tightening existing standards (compare M1.1 and M1.2 with M2.1

and M2.2) and appear to postpone these decisions to the second half of the term. This may also result from the need to gather scientific information in order to be able to define appropriate and politically feasible designs for the adjustment of the adopted instruments. This finding is surprising as we would expect policy makers to avoid the electoral costs of further tightening existing regulatory provisions prior to parliamentary elections. As a consequence, hypothesis H5a can be rejected. However, the willingness to adopt policy instruments is enhanced when more parliamentarians belong to environmentally friendly political parties (M1.1 and M1.2). This finding lends partial support to hypothesis H5b (party politics) with respect to policy adoption. As to the impact on policy accommodation, this effect is statistically insignificant.

Finally, policy makers refrain from adopting the standard when atmospheric pollution increases. The degree of problem pressure (here, CO_2 emissions) has a negative effect on instrument adoption (see M1.1–M2.2). This might be explained by the fact that raising levels of pollution increase the (political and economic) costs of ambitious environmental policies. Thus, the results lend partial evidence to hypothesis H6a. The income level of a country, in turn, is not systematically related to any type of policy decision, which leads us to reject hypothesis H6b altogether.

All in all, the adoption of policies and their subsequent accommodation seem to follow different logics and paths. While instrument adoption is enhanced by policy learning and supranational harmonisation, accommodation seems to be triggered by peer pressure between economically and politically integrated countries (i.e., emulation between EU member states).

5. Conclusion

In this paper, we have explored how environmental policies promoted by international organisations change in national jurisdictions after their adoption. For this purpose, we have analysed the adoption of and subsequent changes in NO_x emission standards for large combustion plants promoted by United Nations treaties and EU legislation in 24 OECD countries between 1976 and 2005. Our empirical findings reveal that the tightening of emission standards faces different obstacles than their initial spread (i.e., policy diffusion). While economic competition and high levels of atmospheric pollution seem to reduce the likelihood of policy adoption, changes in political opportunity structures and the existence of supranational regulation appear to prevent countries from tightening standards further beyond the minimum. The overall reluctance of some countries to go beyond certain minimum standards may be explained by the expected negative effects on the country's economic performance.

Policy adoption is found to be the consequence of policy learning, which we operationalised by whether countries are parties to international treaties or protocols that facilitate continued transnational exchange of information. Policy accommodation in turn is rather the result of emulation from culturally and politically similar peers. In other words, governments consider the tightening of existing policies (in this context, NO_x emission standards) not as a response to new international treaties on the issue but rather as a consequence of other countries' decisions to tighten their existing standards. However, this effect holds true only for member states in the EU. In this context, geographical proximity also seems to constitute a strong driver for both the adoption and accommodation of emission standards. Interestingly, economic variables (such as a country's trade dependency or its reliance on foreign investment) do not have a significant positive impact, which contradicts claims made in the literature (see, e.g., Sonnenfeld, 2008). In our analysis, this applies to processes of both policy diffusion and policy accommodation.

Environmental commitment heavily depends on a country's ability to comply with its self-imposed standards. As soon as emission levels increase (or the degree of perceived problem pressure rises), policy makers become reluctant to adopt emission standards thereby resisting public demand for regulation. This finding is a highly interesting one since it qualifies the importance of domestic factors for both the adoption and accommodation of policies concerning air pollution. In other words, not the domestic factors are decisive for accommodation, but the transnational diffusion mechanisms, albeit with the important exception of learning. Nonetheless, we must conclude that policy adoption and accommodation constitute different processes that follow different decision-making logics. We believe that this finding is the most innovative contribution that this study makes to the state of research. However, rather than revealing clear-cut patterns of either a race-to-the-bottom or a race-to-the-top, our findings suggest that there are 'contained' downward pressures that deter (EU) states from going beyond certain externally set minimum standards.

Still, the EU plays a fundamental role in furthering the adoption of these standards in member states. Peer pressure leads EU countries to emulate their neighbours when it comes to accommodating existing policy instruments. Our findings show that within this supranational framework, countries decide to tighten (or accommodate) their emission standards once other member states have done so. Therefore, these results reveal new insights concerning the dynamics of environmental policy making in the EU. In order for a policy innovation to diffuse and to have a sustainable impact on future policy accommodation, states must be supranationally integrated (see also Massey and Biesbroek, 2014, for similar conclusions). Thus, the EU's visible and direct efforts in promoting multilateral agreements indeed promise to have a positive indirect effect on the coordination of environmental policies between countries (see, e.g., Schreurs and Tiberghien, 2007; Schulze and Tosun, 2013) and the creation of peer pressure among (EU) countries in environmental policy making.

This analysis is only the starting point for future research in this area, as a number of questions remain. Do these findings also hold for policies on other direct or indirect greenhouse gases? Further analyses are required to systematically contrast processes of policy adoption and accommodation for different pollutants in order to provide more robust evidence for our preliminary findings. Furthermore, there exist many ways in which the theoretical constructs of interest could be operationalised in a more refined manner, which should then allow for a more rigorous test of the theoretical expectations put forward. It seems particularly promising to use a more nuanced measurement of economic competitiveness as, for example, developed by Cao and Prakash (2012). The authors' measurement is based on the degree of similarity between the export profiles of countries in the sample. It follows the assumption that countries emulate environmental policies from countries or competitors with similar trade structures. The use of this more advanced operationalisation could indeed help to disentangle the relative effects of economic competitiveness and other types of emulation. To be sure, given the way how we measured emulation the observed patterns could potentially be driven by the similarity of geographically proximate countries' trade structures, which clearly needs to be addressed by future studies.

Considering the climate change impacts currently being observed in physical and ecological systems (Adger et al., 2005), additional research is needed to explore what happens to policy innovations promoted by international organisations that seek to mitigate climate change. How do climate policy choices relate to past decisions, given a country's pre-existing policy mix? How effective can climate policy innovations be when they are subsequently modified in order to accommodate them to national

institutional and policy contexts? What is the role of scientific uncertainty? These are among the research questions we deem important to advance the state of research regarding the diffusion of climate policy innovations. We believe that a focus on post-adoption dynamics may be helpful to address these and other research questions posed in the literature, such as whether public policy supports or undermines climate change adaptation (see, e.g., Urwin and Jordan, 2008; Burch, 2010; Biesbroek et al., 2010; Duit et al., 2010). We hope that this study inspires future research addressing these topics.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.gloenvcha.2014.04.001.

References

Adger, N.W., Arnell, N.W., Tompkins, E.L., 2005. Successful adaptation to climate change across scales. Glob. Environ. Change 15, 77–86.
Andonova, L., Mansfield, E.D., Milner, H.V., 2007. International trade and environmental policy in the postcommunist world. Comp. Polit. Stud. 40, 782–807.
Armingeon, K., Weisstanner, D., Engler, S., Potolidis, P., Gerber, M., Leimgruber, P., . Comparative Political Data Set I (23 OECD Countries). http://www.ipw.unibe.ch/content/team/klaus_armingeon/comparative_political_data_sets/index_ger.html.
Bauer, M.W., Jordan, A., Green-Pedersen, C., Héritier, A. (Eds.), 2012. Dismantling Public Policy: Preferences, Strategies, and Effects. Oxford University Press, Oxford.
Berkhout, F., Haug, C., Hildingsson, R., Stripple, J., Jordan, A., 2010. Exploring the future: the role of scenarios and policy exercises. In: Jordan, A., Huitema, D., van Asselt, H., Rayner, T., Berkhout, F. (Eds.), Climate Change Policy in the European Union. Confronting the Dilemmas of Mitigation and Adaptation. Cambridge University Press, Cambridge.
Bernauer, T., Kalbhenn, A., Koubi, V., Spilker, G., 2013. Is there a "Depth versus Participation" dilemma in international cooperation? Rev. Int. Organ. 8, 477–497.
Bernhagen, P., 2008. Business and international environmental agreements: domestic sources of participation and compliance by advanced industrialized democracies. Glob. Environ. Polit. 8, 78–110.
Berry, C.R., Burden, B.C., Howell, W.G., 2010. After enactment: the lives and deaths of federal programs. Am. J. Polit. Sci. 54, 1–17.
Biesbroek, G.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. Glob. Environ. Change 20, 440–450.
Box-Steffensmeier, J.M., Jones, B.S., 2004. Event History Modeling: A Guide for Social Scientists. Cambridge University Press, Cambridge.
Braun, D., Gilardi, F., 2006. Taking 'Galton's problem' seriously: towards a theory of policy diffusion. J. Theor. Polit. 18, 298–322.
Budge, I., Klingemann, H.-D., Volkens, A., Bara, J., Tanenbaum, E., 2001. Mapping Policy Preferences: Estimates for Parties, Electors and Governments 1945–1998. Oxford University Press, Oxford.
Burch, S., 2010. Transforming barriers into enablers of action on climate change: insights from three municipal case studies in British Columbia, Canada. Glob. Environ. Change 20, 287–297.
Burstein, P., Linton, A., 2002. The impact of political parties, interest groups, and social movement organizations on public policy: some recent evidence and theoretical concerns. Soc. Forces 81, 381–408.
Cao, X., Prakash, A., 2012. Trade competition and environmental regulations: domestic political constraints and issue visibility. J. Polit. 74, 66–82.
Cazals, A., Sauquet, A., 2013. When does cooperation win and why? Political cycles and participation in international environmental agreements. CERDI Études et Documents 20.
De Francesco, F., 2012. Diffusion of regulatory impact analysis among OECD and EU member states. Comp. Polit. Stud. 45, 1277–1305.
Dobbin, F., Simmons, B., Garrett, G., 2007. The global diffusion of public policies: social construction, coercion, competition, or learning? Ann. Rev. Sociol. 33, 449–472.
Dupuis, J., Biesbroek, R., 2013. Comparing apples and oranges: the dependent variable problem in comparing and evaluating climate change adaptation policies. Glob. Environ. Change, http://dx.doi.org/10.1016/j.gloenvcha.2013.07.022.
Duit, A., Galaz, V., Eckerberg, K., Ebbesson, J., 2010. Governance, complexity, and resilience. Glob. Environ. Change 20, 363–368.
Finnemore, M., 1996. National Interests in International Society. Cornell University Press, Ithaca, NY.
Frank, D., Hironaka, A., Schofer, E., 2000. Environmental protection as a global institution. Am. Sociol. Rev. 65, 122–127.
Franzese Jr., R.J., 2002. Electoral and partisan cycles in economic policies and outcomes. Ann. Rev. Polit. Sci. 5, 369–421.
Gilardi, F., 2008. Delegation in the Regulatory State: Independent Regulatory Agencies in Western Europe. Edward Elgar, Cheltenham.
Gilardi, F., 2012. Transnational diffusion: norms, ideas, and policies. In: Carlsnaes, W., Risse, T., Simmons, B. (Eds.), Handbook of International Relations. Sage, Los Angeles.
Graham, E., Shipan, C.R., Volden, C., 2008. The Diffusion of Policy Diffusion Research. Working Paper. Ohio State University and University of Michigan.
Gray, V., 1973. Innovations in the state: a diffusion study. Am. Polit. Sci. Rev. 67, 1174–1185.
Haas, E.B., 1980. Why collaborate? Issue-linkage and international regimes. World Polit. 32, 357–405.
Hibbs Jr., D.A., 1992. Partisan theory after fifteen years. Eur. J. Polit. Econ. 8, 361–373.
Holzinger, K., Knill, C., 2005. Cross-national policy convergence: causes, concepts and empirical findings. J. Eur. Publ. Policy 12, 764–774.
Holzinger, K., Knill, C., Sommerer, T., 2008. Environmental policy convergence: the impact of international harmonization, transnational communication, and regulatory competition. Int. Organ. 62, 553–587.
Howlett, M., Joshi-Koop, S., 2011. Transnational learning, policy analytical capacity, and environmental policy convergence: survey results from Canada. Glob. Environ. Change 21, 85–92.
Huber, J., 2008. Pioneer countries and the global diffusion of environmental innovations: theses from the viewpoint of ecological modernisation theory. Glob. Environ. Change 18, 360–367.
Huitema, D., Jordan, A., Massey, E., Rayner, T., van Asselt, H., Haug, C., Hildingsson, R., Monni, S., Stripple, J., 2011. The evaluation of climate policy: theory and emerging practice in Europe. Policy Sci. 44, 179–198.
Jahn, D., 2006. Globalization as 'Galton's problem': the missing link in the analysis of diffusion patterns in welfare state development. Int. Organ. 60, 402–431.
Jordan, A., Bauer, M.W., Green-Pedersen, C., 2013. Policy dismantling. J. Eur. Publ. Policy 20 , http://dx.doi.org/10.1080/13501763.2013.771092.
Jordan, A., Huitema, D., forthcoming. Policy innovation in a changing climate: sources, patterns and effects. Global Environ. Change (forthcoming).
Jordan, A., Huitema, D., van Asselt, H., Rayner, T., Berkhout, F. (Eds.), 2010. Climate Change Policy in the European Union. Confronting the Dilemmas of Mitigation and Adaptation. Cambridge University Press, Cambridge.
Jordan, A., Lenschow, A. (Eds.), 2008. Innovation in Environmental Policy? Integrating the Environment for Sustainability. Edward Elgar, Cheltenham.
Jordana, J., Levi-Faur, D., Fernández-i-Marín, X., 2011. Global diffusion of regulatory agencies: channels of transfer and stages of diffusion. Comp. Polit. Stud. 44, 1343–1369.
Klingemann, H.-D., Volkens, A., Bara, J., Budge, I., McDonald, M., 2006. Mapping Policy Preferences II: Estimates for Parties, Electors, and Governments in Eastern Europe, the European Union and the OECD 1990–2003. Oxford University Press, Oxford.
Knill, C., Tosun, J., 2009. Hierarchy, networks, or markets: how does the EU shape environmental policy adoptions within and beyond its borders? J. Eur. Publ. Policy 16, 873–894.
Knill, C., Debus, M., Heichel, S., 2010. Do parties matter in internationalised policy areas? The impact of political parties on environmental policy outputs in 18 OECD countries, 1970–2000. Eur. J. Polit. Res. 49, 301–336.
Knill, C., Schulze, K., Tosun, J., 2012. Regulatory policy outputs and impacts: exploring a complex relationship. Regul. Govern. 6, 427–444.
Lenschow, A., Liefferink, D., Veenman, S., 2005. When the birds sing. A framework for analysing domestic factors behind policy convergence. J. Eur. Publ. Policy 12, 797–816.
Maggetti, M., Gilardi, D., 2014. How Policies Spread: A Meta-Analysis of Diffusion Mechanisms. University of Zurich. Available: http://www.fabriziogilardi.org/resources/papers/meta-analysis-diffusion.pdf (accessed 27.03.14).
Magnani, E., 2001. The Environmental Kuznets Curve: development path or policy result? Environ. Model. Softw. 16, 157–165.
Massey, E., Biesbroek, R., 2014. The diffusion of adaptation policies across Europe. Global Environ. Change 29, 434–443.
Matisoff, D., Edwards, J., forthcoming. Kindred spirits or intergovernmental competition? The innovation and diffusion of energy policies in the American states (1990–2008). Environ. Polit. (forthcoming).

Meseguer, C., 2005. Policy learning, policy diffusion, and the making of a new order. Ann. Am. Acad. Polit. Soc. Sci. 598, 67–82.
Meyer, J.W., Frank, D.J., Hironaka, A., Schofer, E., Brandon-Tuma, N., 1997. The structuring of a world environmental regime, 1870–1990. Int. Organ. 51, 561–623.
Mickwitz, P., Aix, F., Beck, S., Carss, D., Ferrand, N., Gorg, C., Jensen, A., Kivimaa, P., Kuhlicke, C., Kuindersma, W., Manez, M., Melanen, M., Monni, S., Pedersen, A.B., Reinert, H., van Bommel, S., 2009. Climate Policy Integration, Coherence and Governance. Partnership for European Environmental Research, Helsinki.
Neumayer, E., 2002. Do democracies exhibit stronger international environmental commitment? A cross-country analysis. J. Peace Res. 39, 139–164.
Oberthür, S., Tänzler, D., 2007. Climate policy in the EU: international regimes and policy diffusion. In: Harris, P.G. (Ed.), Europe and Global Climate Change: Politics, Foreign Policy and Regional Cooperation. Edward Elgar, Cheltenham.
Ragusa, J., 2010. The Lifecycle of public policy: an event history analysis of repeals to landmark legislative enactment, 1951–2006. Am. Polit. Res. 38, 1015–1051.
Rogers, E.M., 2003. Diffusion of Innovations. Free Press, New York.
Schaffrin, A., Sewerin, S., Seubert, S., forthcoming. The innovativeness of national policy portfolios: climate policy change in Austria, Germany and the United Kingdom. Environ. Polit. (forthcoming).
Schreurs, M.A., Tiberghien, Y., 2007. Multi-level reinforcement: Explaining European Union leadership in climate change mitigation. Glob. Environ. Polit. 7, 19–46.
Schulze, K., 2014. Do parties matter for international environmental cooperation? An analysis of environmental treaty participation by advanced industrialized democracies. Environ. Polit. 23, 115–139.
Schulze, K., Tosun, J., 2013. External dimensions of European environmental policy: an analysis of environmental treaty ratification by third states. Eur. J. Polit. Res., http://dx.doi.org/10.1111/1475-6765.12011.
Selin, H., Deveer, S.V., 2003. Mapping institutional linkages in European air pollution politics. Glob. Environ. Polit. 3, 14–31.
Shipan, C.R., Volden, C., 2008. The mechanisms of policy diffusion. Am. J. Polit. Sci. 52, 840–857.
Sonnenfeld, D.A., 2008. Globalisation and environmental governance: is another world possible? Glob. Environ. Change 18, 341–342.
Spatareanu, M., 2007. Searching for pollution havens the impact of environmental regulations on foreign direct investment. J. Environ. Dev. 16, 161–182.
Spar, D.L., Yoffie, D.B., 2000. A race to the bottom or governance from the top? In: Prakash, A., Hart, J.A. (Eds.), Coping with Globalization. Routledge, London.
Stadelmann, M., Castro, P., 2014. Climate policy innovation in the South - domestic and international determinants of renewable energy policies in developing and emerging countries. Global Environ. Change 29, 413–423.
Tews, K., 2005. The diffusion of environmental policy innovations: cornerstones of an analytical framework. Eur. Environ. 15, 63–79.
Tews, K., Busch, P.-O., Jörgens, H., 2003. The diffusion of new environmental policy instruments. Eur. J. Polit. Res. 42, 569–600.
Tosun, J., 2012. Environmental monitoring and enforcement in Europe: a review of empirical research. Environ. Policy Govern. 22, 437–448.
Tosun, J., 2014. Agricultural biotechnology in Central and Eastern Europe: determinants of cultivation bans. Sociol. Rural., http://dx.doi.org/10.1111/soru.12046.
Urwin, K., Jordan, A., 2008. Does public policy support or undermine climate change adaptation? Exploring policy interplay across different scales of governance. Glob. Environ. Change 18, 180–191.
Volkens, A., Lacewell, O., Lehmann, P., Regel, S., Schultze, H., Werner, A., 2011. The Manifesto Data Collection: Manifesto Project (MRG/CMP/MARPOR). Wissenschaftszentrum Berlin für Sozialforschung, Berlin.
Walker, J.L., 1969. The diffusion of innovations among American states. Am. Polit. Sci. Rev. 63, 880–899.