

# Policy Characteristics, Electoral Cycles, and the Partisan Politics of Climate Change

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## Abstract

Domestic policies are the cornerstone of the new global climate governance architecture. However, what motivates vote-seeking politicians to pursue climate policies remains remarkably unclear, as the climate politics literature suggests that climate policies are usually not perceived as a vote winner. The present article revisits this issue and argues that a better understanding of the relationship between electoral competition and climate policy making requires taking into account differences both in party ideologies and in policy characteristics. Studying twenty-nine democracies between 1990 and 2016, the analysis finds that climate policy production overall tends to increase as the election approaches due to increases in “soft” policies, such as subsidies, research grants, and information instruments, and relatively stable production rates of “hard” policies like taxes and regulations over the electoral term. Regarding partisan politics, left governments are found to produce more hard, but not more soft, climate policies than center and right governments, especially before elections. This suggests that partisan and electoral incentives are important reference points in the fight against climate change.

The new global climate governance architecture relies fundamentally on domestic policies. However, the current pledges are not sufficient to successfully limit global warming to 2 °C, let alone 1.5 °C (Rockström et al. 2017). Thus, to reach this collective goal, states must rapidly ratchet up the ambition of their national policies (Le Quéré et al. 2019). This situation stresses the need to better understand the motivations of national policy makers for producing climate policies.

Thanks to the growing literature, we already have some understanding of national climate policy making and its drivers (Bernauer 2013; Cao et al. 2014;

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Harrison and McIntosh Sundstrom 2007; Jordan et al. 2018; Purdon 2015). Comparative studies generally show growth in both the number and the ambition of national climate policies, as well as substantial cross-national differences (Bättig et al. 2008; Dubash et al. 2013; Schoenefeld et al. 2019). Such differences have been explained by, for instance, varying membership in international networks and learning effects (Hakelberg 2014; Hildén 2011; Tews et al. 2003) or the presence of democratic institutions, which are understood to provide more public goods than autocratic structures do (Bayer and Urpelainen 2016; Böhmelt et al. 2016). To explain climate policy variation among democracies, scholars have highlighted differences in citizen preferences and ideologies (Berry et al. 2015; Matisoff 2008); interest group strength (Cheon and Urpelainen 2013; Fredriksson et al. 2004); and types of institutions, economic organization, and governments (Bernhagen 2008; Dolšák 2001; Lachapelle and Paterson 2013; Schaffer and Bernauer 2014). Finally, there is growing evidence that political competition is key for understanding energy and climate policy making in democracies (Aklin and Urpelainen 2013; Breetz et al. 2018; Stokes 2016).

Despite these and additional advances, I see one important gap in climate politics research, namely, relating to the relationship between electoral competition and climate policy. Specifically, I see two unsettled questions in this context. The first is *whether* parties, and left–right differences in particular, matter for climate policy making, given that there is not much consensus on this point in the literature (Aklin and Urpelainen 2013; Fankhauser et al. 2015a; Garmann 2014; Harrison and McIntosh Sundstrom 2007; Jensen and Spoon 2011; Neumayer 2003; Tobin 2017; Ward and Cao 2012). The second question, which has so far received much less attention, is *when* governments and policy makers produce climate policy. In other words, we lack knowledge about whether and what kind of electoral cycles exist in the climate policy field. In fact, large-*n* studies dealing with electoral cycles in climate policy making do not seem to exist. However, a few large-*n* studies have included measures of the electoral calendar in their models. Interestingly, they have found either negative election effects, which imply negative electoral incentives associated with climate policy making (Aklin and Urpelainen 2013; Fankhauser et al. 2015a) or no effects at all, which could mean that climate policy is simply not very electorally salient (Garmann 2014). However, it is unclear to what extent these conclusions can be generalized. In particular, they appear remarkably at odds with the continuous increase in climate policies and legislation worldwide as well as increasing concern about climate change and support for climate policies among citizens (Capstick et al. 2015; McCright et al. 2015). This begs the question of whether governments and policy makers may after all (under certain conditions) pursue climate policies with a view to claiming political credit and attracting voters.

In this article, I revisit these two questions and highlight that to study the relationship between electoral competition and climate policy, it is important to consider not only partisan preferences and the electoral calendar but also the characteristics of the climate policies under study, a factor that has been widely

overlooked in previous cross-national studies (especially large-*n* studies). In other words, the article highlights that partisan and electoral incentives will relate not only to the amount and timing of climate policy activity but also to its characteristics (Franzese 2002, 369). For this purpose, I distinguish between “hard” and “soft” climate policies. The former produce costs that are more visible and impose behavioral constraints or negative economic incentives, whereas the latter involve costs that are less visible and focus on positive economic incentives, information, or voluntary cooperation. These differences are expected to result in varying potential for mobilizing conflicting interests, leading to specific patterns of climate policy making across the electoral calendar and under different partisan compositions of government.

To test the arguments, I use comprehensive data on the production of national energy-related climate policies and measures in twenty-nine democracies between 1990 and 2016. Contrary to previous conclusions, the results show that climate policy making tends to increase as an election gets closer. This is due to soft policies, such as subsidies and informational instruments, which are introduced in greater numbers than hard policies like taxes and regulations—especially before elections. Regarding partisan politics, the results show that left governments generally introduce more climate policies than center and right governments. Most importantly, left governments are found to produce more hard, but not more soft, climate policies than center and right governments, especially before elections. This suggests that left governments are not only more willing than other governments to take the electoral risk of burdening voters with more visible costs of climate action but also may actually perceive such policies as an opportunity to win votes. Overall, the results demonstrate that parties matter in climate policy making and that positive electoral incentives are systematic features of this policy field.

## Partisan Politics and Climate Policy

Partisan and electoral cycles in public policy making arise as governments adjust their policy choices and the timing of their political action with a view to their constituents’ interests and their reelection prospects. Such patterns have long been identified for fiscal, economic, and social policy (Besley and Case 1995; Dubois 2016; Franzese 2002; Hibbs 1977; Nordhaus 1975; Potrafke 2017; Wehner 2013). However, whether similar patterns exist for climate policy making is not obvious. Classic partisan theory associates higher levels of state intervention and larger public sectors with left governments, while right governments pursue lower inflation and less government intervention (Hibbs 1977). Therefore, being generally more accustomed to intervening in the economy, left parties may also be expected to intervene more intensely on behalf of the climate and the environment. However, left parties could just as well be more cautious to pursue environmental and climate policies because they tend to increase costs for heavy-polluting industries that employ a significant share of workers—their traditional

core constituency (King and Borchardt 1994). Similarly, if energy demand is inelastic, rising energy prices will tend to hurt workers more than capital owners and thus be more harmful to the voter base of left parties (Garmann 2014, 2).

Such ambivalent arguments have led scholars to study whether policy makers' environmental policy preferences cut across the left–right spectrum of party competition and whether they influence environmental policy making (Bäck et al. 2015; Carter 2013; Dalton 2009; Facchini et al. 2017; Jahn 2016; Neumayer 2003, 2004; Schulze 2014). Interestingly, for climate policy making more specifically, the empirical evidence is fairly divided. Some studies have associated left governments with more climate policies and better climate performance (Garmann 2014; Neumayer 2003; Tobin 2017), while others fail to identify significant ideological differences or stress the importance of environmental policy preferences (Bayer and Urpelainen 2016; Jensen and Spoon 2011; Ward and Cao 2012).

Despite a divided empirical literature, there are, arguably, plausible reasons to expect that left–right differences matter for climate policy making. To this end, let us reconsider the formation of parties' climate policy preferences in more detail—especially the role of public opinion, party competition, and existing policy preferences—and how these mechanisms relate to the left–right dimension (see Ladrech and Little 2019). First, surveys consistently show that public opinion on climate change matches fairly well with individuals' left–right orientation, with the left usually expressing greater concern about a changing climate and greater willingness to act on measures for its protection (Dunlap et al. 2016; Hornsey et al. 2016; McCright et al. 2015). Thus, partisan differences along the left–right dimension may be expected if policy makers are responsive to this uneven preference allocation. Interviewing policy makers and experts from Ireland and Denmark, Ladrech and Little (2019) find supporting evidence that an uneven distribution of climate concern has indeed influenced parties' climate policy preferences and strategies, with left-of-center parties being particularly aware of their more concerned constituents. Second, parties are generally more inclined to attract voters from parties that are closer to them on a particular dimension (Adams and Somer-Topcu 2009). The greatest electoral challenge on the climate change issue arguably comes from green parties, which are still the party family with the most pro-environment policy positions (Carter 2013; Neumayer 2004). Green parties are also, with a few exceptions, closer to the left, so they arguably pose a greater threat to traditional left parties. We can thus expect that other left parties show stronger accommodative behavior and more climate policy activity in response to successful green parties (issue owners) than do parties on the right (Fagerholm 2016; Jahn and Korolczuk 2012; Kitschelt 1994; Spoon et al. 2014). Third, it is well known that responding to climate change requires particularly rapid and profound transformations of national economies and individual lifestyles and thus substantial state-led interventions. Left governments are specifically known for more interventionist policies, and left voters tend to expect these policies from their representatives. Thus, existing policy preferences associated

with traditional left–right politics may induce left governments to become more active in climate policy making than other governments (Båtstrand 2014; Ladrech and Little 2019). Finally, research suggests that climate policy involves more positional disagreement and stronger alignment with the left–right dimension than does environmental policy more generally, the latter arguably being closer to a valence issue (Carter et al. 2018; Farstad 2018). If this is the case, we can also expect that left–right differences are more likely to manifest in climate policy making. In summary, facing more concerned voters and a greater electoral threat from green parties, as well as expectations for more state intervention in a politicized policy field, left governments can be expected to experience stronger electoral incentives to pursue climate policies than other governments. This leads to the first hypothesis:

*H1: The introduction of climate policies becomes more likely under a left government.*

## Electoral Cycles

Although the issues of electoral cycles and partisan politics are closely intertwined, there is much less empirical work concerning the effect of the electoral calendar on climate policy making. The general expectation of electoral cycles in public policy making goes back to Nordhaus (1975), who argued that incumbent governments are likely to boost output and lower unemployment in pre-election periods to maximize their chances of reelection. Subsequent work has stressed that the existence and shape of electoral cycles may depend on many other factors, such as partisan preferences, information asymmetries, and institutional limitations (De Haan and Klomp 2013; Dubois 2016).

However, when is a good time for governments to pursue climate policies? Assuming that climate policies place a constraint on domestic economic actors, new climate policies may induce electoral incentives akin to the introduction of a new tax or charge. The latter are known to be less frequently introduced before elections if reelection is at stake (Besley and Case 1995). Moreover, if the industrial sector is more strongly affected by climate policies, this tendency may be reinforced. As Cazals and Sauquet (2015, 266) note, the industrial sector is typically represented by particularly important lobbies that provide campaign contributions and many jobs to workers that may become threatened by new constraints. Under the threat of losing these votes and substantial lobby support, governments may strive to delay climate policy making to postelection periods that are less critical.

Recent studies have found evidence in line with these arguments. For example, Fankhauser et al. (2015a, 59) find a negative interaction effect between a democracy variable and election year on the passage of climate legislation and therefore argue that “climate legislation is not generally seen as a vote winner” in democracies. Aklin and Urpelainen (2013) find that the election year exerts a negative influence on the growth of renewable energy shares. Finally, Cazals

and Sauquet (2015) find that democratic countries are less likely to ratify international environmental agreements in the pre-election period, while the opposite holds true for autocracies.

As already mentioned, these findings of negative electoral incentives stand in marked contrast with the ever-increasing amount of climate policy worldwide as well as increasing climate concerns of citizens, particularly among democracies. This begs the question of whether the pursuit of climate policies is in fact predominantly unpopular for vote-seeking politicians and whether it is even possible to identify systematic efforts by policy makers to win votes through more active climate policy making. List and Sturm (2006) offer support for a similar conjecture, finding that US governors strategically manipulate environmental policies when their reelections are at stake to attract additional voters. Similarly, McAlexander and Urpelainen (2020) find that both Democratic and Republican legislators are more likely to cast pro-environment votes before an election, catering to a public that is generally in favor of environmental policies.

However, given that the empirical evidence so far predominantly associates climate policy making with negative electoral incentives, I state the second hypothesis in this way and put it up to the empirical test:

*H2: The introduction of climate policies becomes less likely as the election approaches.*

The next section discusses conditions under which positive electoral incentives may be more likely.

## Climate Policy Characteristics

Policy characteristics are an established driver of environmental policy innovation and diffusion—usually alongside domestic and international factors (Jordan et al. 2013; Tews et al. 2003). However, despite recent advances (e.g., Hughes and Urpelainen 2015; Madden 2014; Matisoff and Edwards 2014; Pahle et al. 2018), the potential of policy characteristics for understanding climate policy change and diffusion has yet to be used to full capacity (Jordan and Huitema 2014, 724; Keohane 2015; see also Makse and Volden 2011).

To incorporate policy characteristics into our understanding of how partisan and electoral competition affects climate policy making, I rely on established policy literature distinguishing between different policy instruments and governance principles. The primary goal is to derive testable hypotheses about how policy choice relates to electoral competition. I therefore opt for a parsimonious and substantive rather than procedural distinction between “hard” and “soft” climate policies grounded in the taxonomy of policy instruments established by Vedung (1998) and extended by Steurer (2011) (see also Schaffrin et al. 2015). The taxonomy distinguishes between regulatory (“sticks”), economic (“carrots”), informational (“sermons”), cooperative (“ties”), and organizational (“adhesives”) policy instruments. This model is appropriate for the present

analysis because the starting point for the distinctions is the relationship between public authorities and private actors and the degree of authoritative force (see also Sager 2009, 539–540). In the following, I draw on this basis to conceptualize the relationship between governments and voters in climate policy making.

The main argument is that different climate policies can be broadly placed into two categories—hard and soft—based on their degree of authoritative force, which can be associated with the visibility of the costs they produce. Hard climate policies include bans and regulations (“command-and-control” instruments), which aim to control the behavior of citizens and firms by limiting their choices. For instance, emissions standards define the spheres of legal versus illegal behavior and lead to directly visible costs for the addressees, for example, car industries (Meckling and Nahm 2018). In contrast, economic policy instruments do not require addressees to change their behavior, but they establish positive and negative incentives to achieve such changes. However, different types of economic instruments vary in their emphasis of these incentives. I therefore depart from previous studies (see Schaffrin et al. 2015; Steurer 2011) and do not place carbon taxes and tradable permit schemes in the same category as other economic and financial instruments, such as subsidies and tax rebates. Rather, the former are considered hard policies because they usually involve negative economic incentives, punishing carbon-intensive behavior, and highly visible costs that can invoke considerable opposition from large, well-organized groups of heavy emitters of greenhouse gases (Madden 2014, 6; see also Shwom et al. 2010).

Soft climate policies, by contrast, impose costs that are less visible to voters and organized interests, mainly because they are paid through the general revenue system.<sup>1</sup> This includes soft economic instruments, which emphasize positive financial incentives rewarding carbon-saving behavior. Subsidies and tax rebates for the purchase of solar panels or energy efficient retrofits, as well as research grants for the development of climate-friendly technologies, fall into this category. Such policies can also create an electoral advantage by stimulating supporter coalitions, such as low-carbon industries, through quickly generating and distributing benefits and investing in localized capital. These specific beneficiaries may later become important allies in the political struggle for “harder” climate policies (Jacobs 2016; Pahle et al. 2018). Soft policies also include informational tools, such as energy-efficiency labels or campaigns, that essentially aim to transfer enough knowledge to induce the desired behavior. Finally, voluntary agreements between industry and government as well as institutions and strategies supporting policy implementation can also be considered soft policies (Steurer 2011). In general, the characteristics of soft policies can be expected to involve less controversial policy processes or, as Madden (2014, 7) outlined, to produce costs that are diffuse enough to avoid strong opposition.

However, what kind of policy-making patterns can be associated with hard and soft climate policies? Generally, soft policies should outnumber hard policies

1. Costs may even be passed on to future generations via deficit spending.

because policy makers from almost all camps seek to signal their commitment to climate protection and distribute specific benefits while minimizing electoral risks. Soft policies may be also more prevalent simply because they elicit less opposition and therefore make it easier to achieve necessary consent in the domestic policy process. However, apart from this general pattern, the two types of policies may be associated with diverging electoral cycles. On one hand, we should see more soft policies as the election gets closer, given that, in most countries, a majority of the public generally supports climate change policies (McCright et al. 2015), and policy makers therefore seek to increase their demonstration of climate activism (see List and Sturm 2006; McAlexander and Urpelainen 2020). In this case, softer policies will be the preferred choice, as they offer an opportunity to avoid blame through less visible costs and to claim credit for specific benefits.<sup>2</sup> On the other hand, policy makers should eschew hard climate policies as the election gets closer to avoid strong opposition and punishment at the polls. To be sure, I understand that policy makers also pursue hard policies (for whatever reasons) but prefer not to highlight them in the run-up to elections. This leads to the next hypothesis:

*H3: The introduction of hard (soft) climate policies becomes less (more) likely as the election approaches.*

Having incorporated policy characteristics into expectations on electoral cycles, we now need to reconsider partisan incentives. The general argument was that left governments have stronger electoral incentives to introduce climate policies than other governments. To demonstrate greater climate activism, left governments could therefore also produce more hard climate policies (along with soft policies), precisely because they are more visible and therefore send a stronger signal to voters who are more concerned about climate change. Moreover, left parties' existing policy preferences for more state intervention are generally more in line with hard climate policies than those of other parties (Båtstrand 2014). Overall, I therefore expect that not only will left governments be more willing than other governments to impose more visible costs upon voters but they may actually perceive hard climate policies as an opportunity to win additional votes and prevent voter loss to green parties. Second, if this is the case, it is also plausible to expect that left governments will not only not bother delaying the introduction of hard climate policies until after the election but may actually increase the production of hard policies ahead of it (in addition to increasing the production of soft climate policies). However, I would not expect stark partisan differences for

2. By pursuing direct investments and subsidies, policy makers may in fact seek credit for both economic stimuli, especially for green industries, and climate protection. These two motivations are not mutually exclusive. However, differing partisan and electoral incentives can still be expected, because policy makers can decide, based on their preferences, toward which industries and sectors (not) to target their stimulus policies.

soft climate policies because the latter are more likely to attract voters and parties from the left and right alike. This leads to the final hypothesis:

*H4: The introduction of hard climate policies becomes more likely under a left government, especially as the election approaches.*

## Analytical Scope and Data

There is an ongoing debate on how to measure climate policy and its changes (see, e.g., Dupuis and Biesbroek 2013; Knill et al. 2012; Schaffrin et al. 2015). Here, I use the International Energy Agency's (IEA) Policies and Measures Database, which covers past and existing energy-related government policies and measures aimed at reducing greenhouse gas emissions for all IEA member states and a number of additional countries (see also Cao and Ward 2016; Hughes and Urpelainen 2015). The country sample is restricted to IEA member states, as their governments had the opportunity to regularly review the data (in contrast to non-IEA members). The analysis therefore includes all twenty-nine IEA member states (as of 2016) observed from 1990 through 2016.<sup>3</sup> This amounts to 783 country-years, of which 183 have no policy activities and 600 have at least one climate policy introduced at the national level.

As summarized in Table 1, I distinguish between hard and soft climate policies using the IEA's categorization of policies into different types and subtypes. Hard policies include climate-related taxes and carbon trading mechanisms, user charges, codes and standards, and general auditing and monitoring schemes,<sup>4</sup> which all impose directly visible costs for private actors. In contrast, soft policies include direct investments, grants and subsidies, policy development and reform, informational tools, and voluntary approaches, all involving costs that are less visible. As the IEA database can assign policies to several types, the coding process started off with classifying a policy as "soft" only if it does not simultaneously belong to any of the policy subtypes defined as "hard." In a second step, all the (prima facie) hard policies were reviewed to check whether they are in fact hard policies according to the outlined arguments. This led to the reclassification of several policies as soft, such as industry codes and standards that are voluntary. Moreover, policies that are predominantly soft but have some hard elements attached, for example, research funds and demonstration projects where recipients are audited and monitored were reclassified.<sup>5</sup>

3. Mexico joined the IEA in 2018 as the organization's thirtieth member.

4. Monitoring and reporting mechanisms can be important "hard" components even of governance frameworks that are soft in principle (Knodt and Schoenefeld 2020).

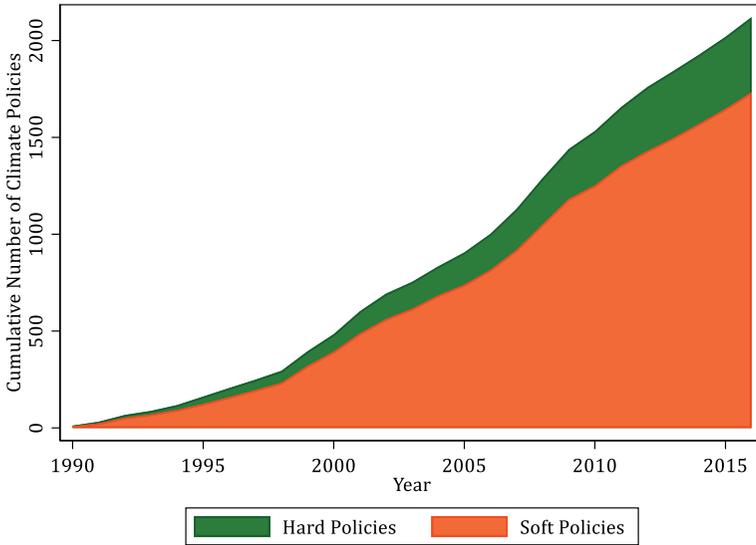
5. Feed-in tariffs (FIT) are distinguished further between more-visible-cost systems paid through user charges and less-visible-cost systems paid through the general budget. Data collection also involved extensive desk research for policies in the IEA database that had unclear or missing information.

**Table 1**

## Two Categories of Climate Policies

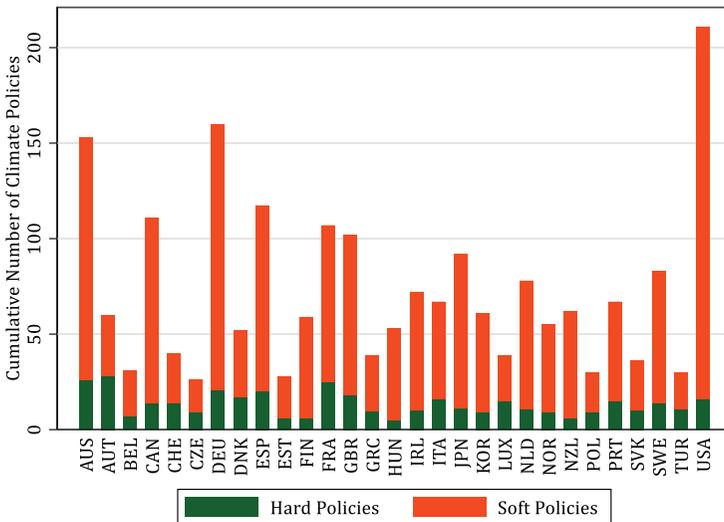
<i>Hard Climate Policies</i>	<i>Soft Climate Policies</i>
<p>Regulatory instruments and economic instruments with negative incentives. Costs are more visible (directly borne by firms and individuals).</p> <ul style="list-style-type: none"> <li>• Taxes and tradable permit schemes</li> <li>• User charges</li> <li>• Codes and standards (building codes and product standards, sectoral standards, vehicle fuel-economy and emissions standards)</li> <li>• Obligation schemes and other mandatory requirements</li> <li>• Mandatory auditing and monitoring schemes</li> </ul>	<p>Economic instruments focusing on positive incentives, public investments, organization, informational and voluntary instruments. Costs are less visible (mainly paid through the general budget).</p> <ul style="list-style-type: none"> <li>• Direct investments, grants and subsidies, loans, tax relief</li> <li>• Policy development and reform (policy support, including institutional creation and strategic planning)</li> <li>• Research, development, and deployment (RD&amp;D) (including demonstration projects, research programs for technology deployment and diffusion and for technology development)</li> <li>• Information and education (including advice/aid in implementation, information provision, performance labels, professional training and qualification)</li> <li>• Voluntary approaches (negotiated agreements between public–private sector, public voluntary schemes, unilateral commitments by private sector)</li> </ul>

*Source:* Author's elaboration based on IEA (2020).



**Figure 1**  
Cumulative Number of Climate Policies in Twenty-Nine IEA Member States, 1990–2016

Following this distinction, the data set identifies 388 hard and 1,733 soft national climate policies. Following the theoretical arguments, the focus is on the number, or “density,” of different types of policies and not their content or expected outcomes. However, this also means that the analysis does not



**Figure 2**  
National Stocks of Climate Policies in 2016

distinguish further between different levels of policy “intensity,” for example, different tax or grant levels.<sup>6</sup> Figure 1 presents the cumulative number of climate policies aggregated over the country sample and shows rapid growth, especially since the late 1990s. Figure 2 presents the national stocks of hard and soft policies introduced across the countries under study as of 2016. The largest overall stock of energy-related climate policies (211 policies) exists in the United States. The Czech Republic, by contrast, has only introduced twenty-six policies, while the sample average is approximately seventy-three policies.

## Empirical Analysis

Table 2 gives a first impression regarding the main research questions by showing the mean number of climate policy introductions over the course of the electoral term and different types of government. I identify left, center, and right governments based on the Seki–Williams measure of the partisan complexion of government (2014), which is an updated version of the Woldendorp et al. (2000) index, placing governments on an ideological scale between 1 and 5. I define right governments as marked by either right party dominance or right-center complexion in government and parliament (index values of 1 and 2), center governments by a balanced situation (index value of 3), and left governments by either left-center complexion or left party dominance (index values of 4 and 5).<sup>7</sup> In this context, one drawback of the yearly periodization of the data set should be noted; namely, for election years, it cannot precisely identify whether a given policy was introduced before or after the election date. As the Seki–Williams measure is also a weighted average in election years, I use the index values for the dominant context in these years. Therefore, the results for the election year should generally be taken with a grain of salt.

The first thing to note is that the mean of all policies is highest in the year before an election, is second highest in the election year, and decreases if two or more years are left in the electoral term. This runs counter to the expectation that approaching elections exert a negative effect on climate policy making. If anything, this finding hints at positive incentives for introducing climate policies as the election approaches. Neither do these descriptive results suggest that hard climate policies are less likely to be introduced in the run-up to elections. At best,

6. Despite important advances (Howlett and Cashore 2009; Knill et al. 2012; Schaffrin et al. 2015; Schmidt and Sewerin 2019), the measurement of policy intensity remains particularly challenging, especially in aggregate analyses facing complex policy mixes. Open questions include, for example, how to measure, aggregate, and relate different policy components to one another; how to consider different contexts; and finally, how this influences policy processes and the behavior of policy makers (for a recent discussion, see Capano and Howlett 2020).

7. This is a reasonable simplification, as no governments are dominated by the left and only a few are dominated by the right in the data set. I extended the Seki–Williams data to 2016 and added data for South Korea. Data on electoral terms come from the Database of Political Institutions (DPI) (Cruz et al. 2018).

**Table 2**

Climate Policy Introductions by Years Left in the Electoral Term in Twenty-Nine IEA Member States, 1990–2016

Years	All Governments				Left Governments				Center Governments				Right Governments			
	Mean	SE	Lower	Upper	Mean	SE	Lower	Upper	Mean	SE	Lower	Upper	Mean	SE	Lower	Upper
<i>All Policies</i>																
0	2.82	0.30	2.22	3.42	3.52	0.61	2.30	4.75	2.11	0.33	1.45	2.77	2.99	0.56	1.86	4.11
1	3.14	0.27	2.60	3.67	3.53	0.54	2.44	4.62	3.46	0.64	2.16	4.77	2.67	0.32	2.03	3.30
2	2.68	0.19	2.30	3.05	2.92	0.35	2.21	3.62	2.64	0.36	1.92	3.37	2.52	0.30	1.94	3.11
3	2.57	0.21	2.16	2.98	2.60	0.34	1.93	3.27	2.91	0.42	2.06	3.76	2.31	0.33	1.65	2.97
4	1.91	0.33	1.26	2.56	3.00	0.90	1.03	4.97	1.83	0.76	0.17	3.50	1.52	0.35	0.80	2.24
All years	2.71	0.12	2.48	2.94	3.11	0.22	2.67	3.55	2.66	0.21	2.25	3.07	2.49	0.18	2.15	2.84
<i>Hard Policies</i>																
0	0.43	0.06	0.31	0.54	0.75	0.17	0.41	1.09	0.32	0.09	0.14	0.50	0.32	0.07	0.18	0.45
1	0.51	0.07	0.38	0.64	1.05	0.16	0.74	1.37	0.15	0.07	0.01	0.29	0.28	0.06	0.16	0.40
2	0.52	0.06	0.41	0.63	0.73	0.12	0.50	0.97	0.53	0.12	0.30	0.77	0.36	0.06	0.23	0.49
3	0.56	0.06	0.44	0.68	0.65	0.12	0.41	0.89	0.56	0.11	0.35	0.77	0.49	0.09	0.32	0.66
4	0.44	0.09	0.25	0.62	0.58	0.29	0.08	1.09	0.50	0.23	-0.01	1.01	0.36	0.11	0.13	0.58
All years	0.50	0.03	0.44	0.55	0.79	0.08	0.65	0.92	0.41	0.05	0.31	0.50	0.36	0.03	0.29	0.42
<i>Soft Policies</i>																
0	2.40	0.292	1.83	2.96	2.77	0.53	1.70	3.84	1.79	0.30	1.19	2.39	2.67	0.56	1.56	3.78
1	2.63	0.25	2.13	3.13	2.47	0.48	1.52	3.43	3.31	0.65	2.00	4.62	2.39	0.30	1.78	2.99
2	2.16	0.18	1.81	2.50	2.18	0.31	1.57	2.80	2.11	0.32	1.48	2.75	2.16	0.28	1.60	2.72
3	2.01	0.19	1.64	2.38	1.95	0.31	1.33	2.56	2.35	0.40	1.56	3.15	1.81	0.29	1.25	2.38
4	1.47	0.30	0.88	2.06	2.42	0.76	0.74	4.10	1.33	0.66	-0.11	2.76	1.16	0.34	0.46	1.86
All years	2.21	0.11	2.00	2.42	2.32	0.19	1.94	2.71	2.26	0.20	1.87	2.65	2.13	0.17	1.80	2.47

Column 1 reports the mean number of climate policy introductions for the number of years left in the electoral term. Column 2 gives the standard error (SE). Columns 3 and 4 report the upper and lower bounds of 95 percent confidence intervals.

there appears to be a rather small decrease over the electoral term. In contrast, Table 2 shows that soft policies are, on average, more likely to be introduced in the year before an election (mean number of policies of 2.63) than in all other years of the electoral term, especially when compared to nonelection years. Thus, in general, there might be a positive electoral incentive to introduce soft climate policies, while the situation appears to be more complex for hard policies. The following parts concentrate on government ideology as a potential conditioning factor.

Inspecting the distribution of policy production under different partisan governments, the mean number for both hard and soft policies is generally highest under left governments, followed by center and right governments. Most interestingly, the mean number of hard climate policies tends to increase under left governments as the election approaches, while the exact opposite pattern can be observed for center and right governments. Thus, the relatively stable production rates of hard policies over the electoral term are in fact a result of opposing trends across different types of partisan government. Notably, there is no such partisan discrepancy in the production of soft policies, which tend to increase under all types of partisan government as the election approaches. I continue with multiple regression analysis to control for various other factors that may also affect climate policy production.

### *Control Variables*

The first control variable denotes the participation of a green party in government, as this party family may have a particularly strong policy impact on climate policy making once in office. Second, the parliamentary seat share of green parties controls for the electoral threat from green issue owners and any policy effect associated with their role in parliament (Jensen and Spoon 2011). Third, an indicator of majority government takes into account that minority governments might have to secure additional parliamentary support to introduce climate policies. Fourth, the degree of institutional and political constraints (veto players) may also affect climate policy making. Therefore, the widely used index developed by Henisz (2000) is included. Next, climate policy-making may be subject to nonlinear path dependencies as existing climate policies first stimulate more policy making but later decrease the need for further policies because aspects are increasingly already addressed (Fankhauser et al. 2015a). This is taken into account by including domestic stocks of climate policy introductions and their square term. In this, I test whether stocks of soft climate policies pave the way for more hard policies, as the sequencing literature argues. Finally, there might be a (perceived) trade-off between climate policies and economic growth as well as a propensity of richer countries to introduce more climate policies. GDP growth rates and the GDP per capita are included to capture such effects.

A last set of controls refers to international influences. First, I control for IEA membership, as some member states have only joined the IEA during the observation

period. Second, the EU's potential impact on national climate policy is considered by distinguishing members and nonmembers (Avrami and Sprinz 2019; Schreurs and Tiberghien 2007). Third, a dummy variable is included that takes on a value of 1 for countries hosting a UN climate conference (COP) in the year of the meeting and the subsequent two years (Fankhauser et al. 2015b) as well as a dummy variable indicating whether a country has ratified the Kyoto Protocol. Finally, other countries' climate policies can create stimuli (diffusion mechanisms) for countries to follow suit. The average stock of climate policies introduced among a given country's neighboring IEA members is added to control for such effects.

### *Estimation Issues*

The dependent variable is a positive count of national energy-related climate policies introduced over each year. The standard analytical approach in this situation would be to estimate negative binomial regression models. Country and year fixed effects would moreover account for time-invariant unobserved country characteristics, such as electoral rules and temporal dynamics like technological advances or growing public concern about climate change. Using country-fixed effects would also be feasible given substantial within-country variation in policy introductions (standard deviation of 2.8) exceeding between-country variation (standard deviation of 1.65). Unfortunately, there is no generally recommended fixed effects negative binomial estimator (Allison and Waterman 2002). I therefore follow recent examples (Bove and Böhmelt 2016; Gleditsch and Polo 2016) and log transform the dependent variable after adding 1, which allows one to run linear panel regressions with country and year dummies. Table 3 shows the main results.<sup>8</sup>

### *Regression Findings*

First, model 1 shows evidence that left governments are associated with more climate policy activity. The coefficient of the left government dummy variable is positive, as expected, and significant at the 5-percent level, thus supporting the first hypothesis. More precisely, controlling for the effect of the electoral cycle and all other variables in the model, the number of new policies increases by approximately 21 percent under a left government if compared to a center or right government. Second, judging by the associated nonsignificant coefficient, the electoral calendar does not appear to matter for climate policy production, thus rejecting the second hypothesis. This conclusion also holds when the electoral

8. The appendix ([https://doi.org/10.1162/glep\\_a\\_00593](https://doi.org/10.1162/glep_a_00593)) to this article includes summary statistics and data sources for all variables as well as a battery of robustness checks, which all confirm the main conclusions. For instance, I use the share of hard and soft policy production instead of counts, add center and right governments to the models, and measure government ideology in terms of the cabinet seat shares and in terms of left-right and environmental policy positions derived from manifesto data. I also add further control variables, estimate negative binomial regression models without fixed effects, and drop each country in turn to see whether results are driven by particular countries.

**Table 3**  
Climate Policy Production in Twenty-Nine IEA Member States, 1990–2016

	<i>All Policies</i>		<i>Hard Policies</i>		<i>Soft Policies</i>	
	(1)	(2)	(3)	(4)	(5)	(6)
Left government	0.192** (0.075)	0.190** (0.075)	0.212*** (0.038)	0.212*** (0.039)	0.087 (0.078)	0.085 (0.078)
Years left in term	-0.017 (0.020)		0.018 (0.013)		-0.030 (0.021)	
Years left in term = 0		0.076 (0.105)		-0.014 (0.068)		0.102 (0.122)
Years left in term = 1		0.105 (0.106)		0.001 (0.074)		0.111 (0.125)
Years left in term = 2		0.063 (0.100)		0.032 (0.077)		0.053 (0.122)
Years left in term = 3		0.046 (0.105)		0.059 (0.069)		0.018 (0.120)
Greens in government	-0.135 (0.080)	-0.130 (0.082)	0.050 (0.095)	0.051 (0.096)	-0.196*** (0.064)	-0.193*** (0.064)
Green seats	-0.008 (0.021)	-0.007 (0.021)	-0.005 (0.010)	-0.004 (0.010)	-0.009 (0.020)	-0.009 (0.020)
Majority government	0.001 (0.098)	0.000 (0.099)	-0.028 (0.061)	-0.029 (0.061)	-0.005 (0.091)	-0.005 (0.091)
Political constraints	0.351 (0.426)	0.341 (0.424)	-0.247 (0.275)	-0.257 (0.279)	0.326 (0.432)	0.322 (0.432)

**Table 3**  
(Continued)

	<i>All Policies</i>		<i>Hard Policies</i>		<i>Soft Policies</i>	
	(1)	(2)	(3)	(4)	(5)	(6)
Domestic stock <sup>a</sup>	0.010** (0.004)	0.010** (0.004)	-0.001 (0.003)	-0.001 (0.003)	0.014*** (0.004)	0.014*** (0.004)
Domestic stock <sup>2,a</sup>	-0.000** (0.000)	-0.000** (0.000)	0.000** (0.000)	0.000** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
GDP growth	0.009 (0.009)	0.009 (0.009)	0.006 (0.004)	0.006 (0.004)	0.006 (0.011)	0.006 (0.011)
GDP p.c. (log)	0.100 (0.080)	0.103 (0.078)	-0.007 (0.034)	-0.004 (0.033)	0.107 (0.073)	0.107 (0.071)
IEA member	0.120 (0.146)	0.121 (0.146)	0.117* (0.059)	0.117* (0.060)	0.054 (0.159)	0.055 (0.159)
COP host	0.196 (0.139)	0.188 (0.143)	0.028 (0.078)	0.021 (0.077)	0.223 (0.150)	0.220 (0.153)
Kyoto ratification	-0.156 (0.182)	-0.151 (0.182)	0.091 (0.080)	0.092 (0.081)	-0.265* (0.150)	-0.262* (0.151)
EU member	-0.066 (0.184)	-0.066 (0.184)	-0.058 (0.097)	-0.058 (0.097)	-0.028 (0.186)	-0.029 (0.186)
Diffusion (neighbors)	-0.000 (0.002)	-0.000 (0.002)	0.002* (0.001)	0.002* (0.001)	-0.001 (0.002)	-0.001 (0.002)
Observations	768	768	768	768	768	768
Log likelihood	-618.545	-618.190	-343.896	-343.121	-626.950	-626.706
R <sup>2</sup>	0.469	0.469	0.231	0.233	0.453	0.454

All models include country and year fixed effects. Standard errors are in parentheses and clustered by country.

<sup>a</sup>Estimates are for stocks of all climate policies in models 1, 2, 5, and 6 and stocks of soft policies in models 3 and 4.

\* $p < 0.10$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

effect is estimated in terms of separate coefficients for the remaining years in the electoral term, treating four years left as the reference category (model 2). Models 3/4 and 5/6 show results split between hard and soft climate policies. The results do not support the existence of an electoral climate policy cycle conditional on the distinction between hard and soft policies (thus rejecting hypothesis 3). Rather, in line with the general literature on electoral cycles (De Haan and Klomp 2013; Dubois 2016), this suggests that the effect may be more complex and possibly conditional on other variables, such as partisan preferences. Comparing the effect of left government across the models indicates that the partisan effect is indeed conditional on policy type, as expected. The coefficients are highly significant for hard policies and insignificant for soft policies, suggesting that left governments produce more hard climate policies than center and right governments, but not more soft policies (thus supporting hypothesis 4).

Regarding the control variables, rather surprisingly, the results suggest that green representation in government has no effect on hard policies and is actually associated with fewer soft policies. However, the negative effect is not particularly robust and disappears, for instance, in models without fixed effects or if excluding years before 1999, which is when the IEA started to collect policy data (see the appendix, here: [https://doi.org/10.1162/glep\\_a\\_00593](https://doi.org/10.1162/glep_a_00593)).<sup>9</sup> The results also suggest that previous experience with climate policy production has a positive effect on the introduction of additional soft policies and that this effect levels off at some point. The situation appears to be different for hard policies, where domestic stocks of soft policies only seem to exert a positive effect at higher levels.

To further test hypothesis 4, I next introduce interaction terms between government partisanship and the election cycle. Table 4 presents the results. As hypothesized, the results show that left governments are associated with the production of more hard climate policies but are unrelated to the production of soft policies as the election approaches. In model 3, the coefficient of the interaction term is negative and significant as expected, while the coefficient is insignificant in model 5. Precisely, according to model 3 and holding all other variables at their means, the number of hard climate policies increases by approximately 30 percent in the pre-election year under left government or by almost 160 percent compared with a center or right government in the same year.

Inspecting the *p*-values of the interaction term can already be termed a rather conservative strategy in testing for the presence or absence of an interaction effect (Pepinsky 2018). However, the presence of an interaction effect still assumes sufficient common support across values of the moderator and linearity. I investigate both issues by employing the binning estimator routine developed by Hainmueller et al. (2019). The results are presented in Figure 3.

9. The data also show that governments with green parties actually produce both more hard and more soft policies on average than left, center, and right governments without green party representation. I therefore recommend that these results not be overstated. Convincing explanations of this result and the absence of a green party effect would likely require further in-depth study of those government coalitions with green party participation.

**Table 4**

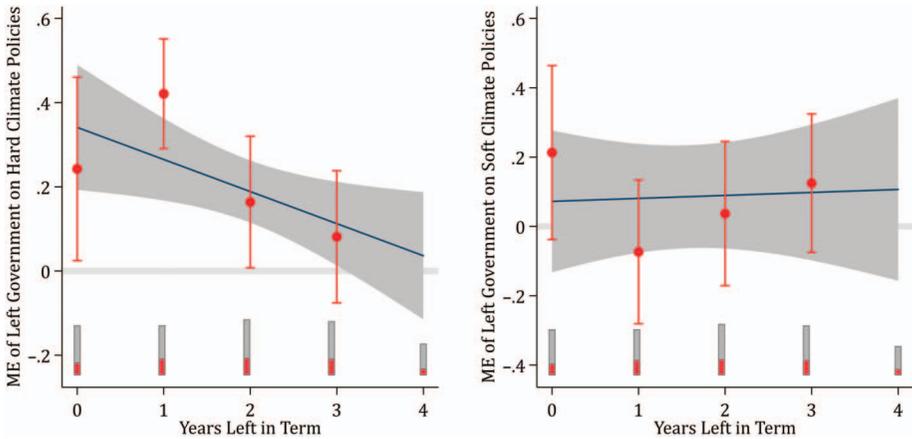
Climate Policy Production in Twenty-Nine IEA Member States, 1990–2016, Interaction Effects

	<i>All Policies</i>		<i>Hard Policies</i>		<i>Soft Policies</i>	
	(1)	(2)	(3)	(4)	(5)	(6)
Left government	0.247** (0.106)	0.210 (0.230)	0.341*** (0.077)	0.010 (0.087)	0.072 (0.107)	0.287 (0.243)
Years left in term	–0.008 (0.024)		0.038** (0.014)		–0.033 (0.024)	
Left × Years Left in Term	–0.032 (0.046)		–0.076** (0.034)		0.009 (0.047)	
Years left in term = 0		0.051 (0.115)		–0.067 (0.065)		0.117 (0.129)
Left × Years Left in Term = 0		0.102 (0.268)		0.233 (0.155)		–0.074 (0.278)
Years left in term = 1		0.124 (0.125)		–0.112 (0.067)		0.212 (0.138)
Left × Years Left in Term = 1		–0.052 (0.244)		0.411*** (0.119)		–0.360 (0.246)

Years left in term = 2		0.090		0.004		0.116
		(0.115)		(0.065)		(0.129)
Left × Years Left in Term = 2		-0.079		0.154		-0.250
		(0.247)		(0.108)		(0.270)
Years left in term = 3		0.060		0.057		0.052
		(0.111)		(0.076)		(0.121)
Left × Years Left in Term = 3		-0.042		0.072		-0.162
		(0.260)		(0.106)		(0.250)
Observations	768	768	768	768	768	768
Log likelihood	-618.187	-617.110	-339.755	-334.231	-626.925	-623.607
R <sup>2</sup>	0.469	0.470	0.240	0.250	0.453	0.458

All models include country and year fixed effects and the full set of controls from Table 3. Standard errors are in parentheses and clustered by country.

\* $p < 0.10$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .



**Figure 3**

Marginal Effect Plot and Binning Estimator Based on Models 3 and 5 from Table 4.

The left panel shows the interaction effect for hard policies (model 3) and the right panel for soft policies (model 5). Little surprising, the distribution of observations and treatments over the electoral term is quite balanced, as indicated by the histograms at the bottom. There is one exception, however: there are fewer observations for four years left in the current term given that few countries in the sample maintain five-year election periods. In fact, the treatment effect is not identified in this case. Nevertheless, the left plot is quite consistent with the presence of an interactive effect between left government and the electoral cycle in the case of hard policies as, with the exception of three years left into the electoral term, neither the bins nor the marginal effect estimates cross zero. Moreover, there is only a limited overlap between the bin for one year and the bins for two and three years left in the term. By contrast, the right plot shows marginal effect estimates that slightly increase with more years left in the current term. However, the confidence intervals of both the marginal effects plot and the binning estimator cross zero and therefore confirm that there is no interactive relationship in the case of soft climate policy production.

Regarding linearity, the left panel shows that there might indeed be a problem, mainly related to the estimates for zero and one year left in the term.<sup>10</sup> The Wald test also marginally rejects linearity, with a  $p$ -value of 0.08. In fact, with only a few unique values on the moderator variable, Hainmueller et al. (2019, 166) recommend estimating a fully saturated model using dummy variables and including all interaction terms. I follow this advice in models 2, 4, and 6 shown in Table 4. The results confirm that the production of hard policies increases in the pre-election year under left government (model 4), while all other interaction

10. As already mentioned, the estimates for the election year should generally be treated with caution given the lack of precision with which both partisan government and policy production are measured here.

terms fail to achieve conventional levels of statistical significance. Overall, these results are therefore robustly in line with the fourth hypothesis and indicate that left governments are more likely to introduce hard climate policies before elections. Not only do left governments seem to be more willing to take the electoral risk of imposing more visible costs upon voters but, unlike center and right governments, they may actually perceive such policies as an opportunity to win or keep votes.

## Conclusions

The new global climate governance architecture relies fundamentally on national climate policy making. In this context, this study sought to improve our understanding of the drivers of national policy efforts. In particular, I looked at the role that electoral competition plays in climate policy making, a relationship that can be deemed remarkably puzzling in previous research results. Addressing this puzzle, I expected that electoral incentives in climate policy making would be conditional on government ideology and policy characteristics. To show this, I compiled information on policy characteristics and merged them with data on government partisanship and electoral terms. This is a novel contribution to the climate policy and politics literature, especially to the existing large-*n* studies.

In general, the results show that soft climate policies, such as subsidies and information campaigns, are introduced in greater numbers than hard policies like taxes and standards under all types of partisan government and at all times during the electoral term. Contrary to what the existing literature suggests, the data show that overall, climate policy making in democracies tends to increase as elections get closer. This is due to increases in soft but not hard policies, the latter showing more stable production rates over the electoral term. Furthermore, the results suggest that electoral climate policy cycles vary depending on government ideology, with left governments being more inclined to pursue hard climate policies in the run-up to elections. Overall, these results paint a more nuanced and more optimistic picture of the effects of electoral competition on climate policy outputs than do the results of previous research. They suggest that the timing, nature, and partisan origins of climate policies deserve further attention from both climate politics scholars and climate policy advocates.

Of course, this contribution remains limited in several ways. First, as already mentioned, the data set does not allow for precisely identifying, for election years, which policies were introduced before and after the election date. Thus, more fine-grained time series data on policy introduction as well as partisan (and other) variables may be useful to verify the present initial findings. Second, while this aggregate analysis argues that conflict potential varies for different types of climate policies, it neither derives the conflict potential related to a given policy's intensity (for instance, the level of a given tax or subsidy) nor does it relate to the expected outcomes of a given policy or policy type (see Peñasco et al. 2021). Future research may consider such details to further understand the nature and

conditions of electoral incentives in climate policy making. Finally, future research should further establish what happens to the electoral fortunes of parties after the introduction of climate policies. In other words, studies of partisan differences in climate policy making should be complemented by efforts to determine whether climate policy making actually leads to electoral gains or losses (see, e.g., Stokes 2016).

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