A polarized climate? Party sorting over climate change and the environment among candidates and voters in Europe

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Contents

Abstract

Political polarization over climate change has been blamed for lack of climate policy progress in several countries, most notably the US and Australia. However, no systematic comparative study exists of party sorting – the degree to which opinion on a given issue correlates with partisan attachment – over climate change and the environment. This article develops a measure of such party sorting using both individual-level party candidate and voter data for the two largest parties in each country. It shows that party sorting over these issues varies strongly across 15 developed countries, with Danish candidates for political office disagreeing the most. Furthermore, it shows that this variation is largely mirrored among the voting public. Surprisingly and contrary to existing argument based on single-country cases, this comparative study finds that party sorting is not associated with less effective climate policy, but rather that the opposite might be the case.

Keywords

Climate change, environment, polarization, parties, climate policy

Introduction

A latent but under-explored hypothesis in the political science literature states that political polarization, understood as strong or increasing distance between major political parties on an issue, leads to bad policy or no policy at all on certain issues. A task force set up by the American Political Science Association in 2013 reported that polarization has rendered the US Congress «incapable of solving a variety of vexing collective problems, which often require the payment of short- and medium-term costs for long-term gains», with climate change a major example of such policy failure (Mansbridge et al. 2013).

Climate change and the environment constitute one of the principal areas in which strong partisan disagreement is seen as having a detrimental effect on policy. For example, Dunlap and McCright (2008) argue that «the existing divide on global warming between political elites poses a serious impediment to creating and implementing an effective federal climate policy with any potential of significantly reducing [US] greenhouse gas emissions», and conjecture that «the political divide within the general public may further inhibit the creation of effective climate policy.» Tranter (2013) argues that political polarization over climate change constitutes «one of the strongest impediments to progressive climate change policy» in Australia.

What are the mechanisms behind the expected detrimental effect of party sorting on climate change policy? A key factor is the long-term character of climate change and other environmental issues. If policies introduced by one party are likely to be undone by the other main party once in office, long-term investments renewable energy and other low-carbon options may be put on hold, notably by private actors. Strong disagreements between major parties thus risks «unhinging the implementation of long-standing policies, and increasing the resistance to any change» (Kim et al. 2013).

However, comparative evidence supporting these claims is scarce, especially from outside the English-speaking world. If the conjecture that partisanship leads to less or weaker policy output holds, we should expect stronger climate policy in countries with less political disagreement over climate change and the environment, and less policy output where political leaders and the public stand further apart on these issues.

Consequently, this paper seeks to answer the following research questions: To what extent do major party candidates agree or disagree on climate change and the environment across countries? Does this variation also exist among voters? And is party sorting of elite and public opinion associated with weaker climate policy?

Party sorting and the environment

Key questions in the literature about party sorting and political polarization revolve around the extent to which the opinions notably of US elected officials and the voting public stand far apart, whether they are becoming more polarized than before and what are the sources of this difference (DiMaggio et al. 1996, Fiorina et al. 2006, Abramowitz and Saunders 2008, Fiorina et al. 2008). Generally, polarization indicates a condition in which objects stand further apart on some measure, relative to a non-polarized state. DiMaggio et al. (1996) list four conceptualizations of polarization in the social sciences: Statistical variance, bimodality, ideological coherence, and intergroup differentiation. Polarization as statistical variance may for example be seen in opinions on single topics such as nuclear power or wind turbines: If large portions of the population are either strongly in favour or strongly against, variance will be greater. Conversely, if most people say they are neither for nor against (say, by picking option 4 on a 1–7 Likert scale), variance and polarization will be low.

The same example may also be used to illustrate polarization as bimodality. If few people choose the neutral middle options on a scale from strong opposition to strong support, the response distribution will have two modes, indicating polarization. Conversely, a tendency to choose central response options, as well as clustering around either support or opposition, will produce a single mode and suggest low polarization. The share of respondents choosing the middle option on the left–right scale is used by Iversen and Soskice (2013) to measure variation in ideological polarization across countries.

The idea of polarization as ideological coherence relates to the degree to which an individual's opinion on one issue is predictable based on that individual's opinions on other issues. DiMaggio and colleagues' fourth and final conceptualization of polarization as intergroup differentiation is defined as the extent to which social groups, defined by select indicators such as age, gender and occupation, differ in their responses to a given question.

In this article, I will explore variation in party sorting over climate change and the environment, operationalizing party sorting as the average difference between individuals' responses to opinion survey questions based on their association with a major political party. Thus, party sorting on a given question (say, the perceived seriousness of climate change) will be high if the average response of voters for party A differs strongly from the average response of party B. If the average responses are equal, by contrast, party sorting will be zero.

Note that this definition does not require high statistical variance or bimodality of opinion in the population at large for a polarized state to exist. What matters is the

degree to which the variation in the population is distributed along party lines, and notably between the two major parties of each country. Polarization thus defined relates to the degree to which an issue is taken up as a political cleavage and affects parties' policy positions and how citizens vote. In the words of Fiorina and Abrams (2008), «subpopulations can sort themselves out in ways that heighten their differences … while population distributions remain unchanged» (578).

While party sorting on climate change and the environment has been studied to some extent in a small number of countries, comparative research on the topic is scarce. Based on data from the World Values Survey collected in 47 countries, Kvaløy et al. (2012) find that individuals self-identifying on the moderate right worry less about global warming than self-identified centrists. They do not find a significant difference between individuals identifying as moderate leftists and self-identified centrists. Nawrotzki (2012) finds that relatively lower support for environmental protection among conservatives is confined to the wealthiest democracies where the environment is already the most protected. Both studies rely on self-reported political ideology placement, which is a problematic indicator of political positions both because it is divorced from support for political alternatives in the form of parties and because self-reported ideology is strongly mediated by access to political information (Iversen and Soskice 2013).

Besides the US studies mentioned above, a few single-country studies from the English-speaking world find party sorting on climate change and the environment. In the UK, climate scepticism is significantly higher among individuals intending to vote for the Conservatives, but overall levels of scepticism remain low (Poortinga et al. 2011). By contrast, significant party sorting on the issue is found in Australia, both at the candidate and voter level (Tranter 2013).

Note also that while theoretical differences exist between climate change and environmental protection more generally, the two issues tend to be perceived by the public as strongly related (Lorenzoni and Pidgeon 2006) and have generated the same sets of coalitions in favour or against political action (McCright and Dunlap 2011, Sabin 2013).

Effects on policy

Does party sorting of public opinion on climate change have an effect on climate policy? I define climate policy output as the degree to which a country introduces policies contributing to the goal of limiting human-made interference with the climate system, notably through emission reduction efforts.

The conventional wisdom is that greater party sorting over climate change leads to ineffective climate policy. Since climate change is a collective action problem and

requires some focused short-term efforts to avoid more diffused damages in the longer term, a degree of agreement on the problem is needed among legislators to produce an effective response. Thus, if half the legislature or population disagrees that climate change should be given priority, substantial climate policy is difficult to sustain over several electoral cycles.

By contrast, a political issue that is contested may also attract political attention by parties eager to increase their vote shares. Contestation may in turn lead to more and potentially better policy on the issue. An inverse causation appears possible in that countries with an active climate policy are likely to see more hotly debates over such policy. The mechanism would be that climate policy instruments such as taxes and regulations create winners and losers, who are then likely to mobilize through the party system to shape, slow, or speed up further policies (Nawrotzki 2012).

Hypotheses

The discussion so far yields the following two hypotheses:

- H1: Party sorting of candidate opinion over climate and the environment is associated with party sorting of public opinion on the same issue area.
- H2: Party sorting of candidate opinion over climate and the environment is associated with lower levels of climate policy output.

Data and methods

Climate change and other environmental issues have increased their electoral salience over the past decades, but remain subservient to economic issues such as employment and redistribution in virtually all major political parties. Instead, «niche» parties have formed to push environmental causes in most developed countries, with varying rates of success (Meguid 2008). While niche parties are important advocates of the issues they emphasize, parliamentary majorities and cabinet formation almost always requires the support of at least one major party. The positions of major parties thus arguably matters more for policy than the strength of niche parties. Yet comparative research on the environmental policies of major parties remains scarce (Carter 2013). I will therefore concentrate on major party candidates and voters in this article.

Selecting countries and parties

I select countries based on the availability of candidate and voter opinion surveys as outlined below. This restricts the study to EU countries plus Australia, Iceland, Norway and Switzerland. For the purposes of calculating party sorting, I choose two

parties in each country based on election and polling data. The parties are listed in Appendix 1.

I then classify the two largest parties so that one is placed on the left and the other on the right. The selection of parties does not take into account membership in traditional party families, with the consequence that for example Ireland's Labour Party is excluded from the study because Fine Gael and Fianna Fáil, two centre–right parties, are supported by more respondents in the survey. I treat Belgium as having two separate party systems: One Francophone and one Flemish-speaking, each with potentially different dynamics of competition (Detterbeck and Hepburn 2010).

The study is motivated by the desire to find party sorting on climate and environmental opinion among two clearly defined opposing sides. This implies that the party systems under study should have two major parties that vie for a substantial share of the votes. Party sorting of opinion in multiparty system would also have been interesting, but measurement is much more difficult than two-way party sorting, not least because party fractionalisation becomes an important confounding factor. Thus, for the purpose of the current study, countries are excluded if fewer than ten percent of the respondents reported having voted for the second-largest party.

Party candidates

To measure party sorting on environmental issues among major party candidates, I use opinions from the Comparative Candidate Survey (CCS) (Pekari et al. 2013). This survey provides data from polling performed between 2005 and 2011. Looking at the two largest parties in each country (listed in Appendix 1) the highest number of candidate responses was submitted from candidates representing the Swiss People's Party (864 over two elections); the lowest number came from the Netherlands, the Social Democratic PvdA (22).

In ten of the countries surveyed under the CCS, the candidates were asked to record their agreement or disagreement with the following statement:

> Stronger measures should be taken to protect the environment.

Answers on a five-point scale were standardized from zero (strong disagreement) to one (strong agreement). The mean score of this variable is .73, with a standard deviation of .26.

In addition, the CCS asks candidates to write down the three most important issues facing their country:

> Most important problem of [country] today?

> Second most important problem of [country] today?
>
> Third most important problem of [country] today?

The answers are either coded based on pre-defined categories, varying by country, or reported in each candidate's own words. In Estonia, Portugal and Switzerland, no pre-defined categories for climate change or the environment existed, yielding no variation between parties. Among the 11 party systems with data on this variable, the shares of major party candidates selecting climate change or the environment as a top issue range from .03 (Austria) to .37 (Norway).

Voters

To compare party differentiation of public opinion on climate change and the environment across countries, an international opinion poll is needed. Such a study requires public opinion data using the same survey questions across countries, combined with data on respondents' political choices or attachments. Data fulfilling these criteria are found in the Eurobarometer opinion poll no. 71.1 of January-February 2009 (European Commission 2009).

The Eurobarometer survey provides sample sizes in excess of 500 for most EU countries, to a maximum of 1,300 for Germany. For each country, the two largest parties are identified based on the vote frequencies reported in the Eurobarometer survey. Countries where fewer than 300 respondents reported having voted for one of these major parties are not included in the analysis.

The Eurobarometer survey contains opinions related to climate change, basic demographics, and party voted for in the most recent election. The principal survey question prompts respondents to rate climate change as a problem on a ten-point scale:

> And how serious a problem do you think climate change is at this moment? Please use a scale from 1 to 10, «1» would mean that it is «not at all a serious problem» and «10» would mean that it is an extremely serious problem «.

I will refer to this variable as «climate concern» in the following. A second climate opinion variable to be used is based on a request to enumerate major problems in the world:

> In your opinion, which of the following do you consider to be the most serious problem currently facing the world as a whole?

Respondents were asked to identify up to three problems, either selecting from a list of eight specific problems (including climate change, terrorism, and economic downturn) or offering their own suggestions. It is likely that suggesting climate change as one of eight options enhances the likelihood that respondents would

select this option, relative to the candidate survey where no items were suggested. The resulting individual-level variable is set at one if a respondent mentioned climate change as a major world problem, and zero if climate change was not mentioned. I will call this variable «climate mention».

Climate policy output

To test the hypothesis that party sorting produces ineffective policy, a measure of climate change policy is needed. There are a number of indexes to choose from (Bättig and Bernauer 2009, Bättig et al. 2008, Dolšak 2009, Saul and Seidel 2011, Lachapelle and Paterson 2013, Burck et al. 2013). Most existing work mixes the degree of actual climate policy enactment with factors such as emission levels and emission trends. The latter type of indicator is less than optimal because emission trends are usually determined by trends in economic output and fuel prices rather than active policy, the prime example being the rapid decline in emissions from Russia, Ukraine, and other post-Soviet states after their heavy industries collapsed in the 1990s (Henry and Sundstrom 2010). Furthermore, policy indexes such as those by Dolšak (2009) and Lachapelle and Paterson (2013) do not distinguish strongly between the set of developed, mostly EU countries included in the present article.

Consequently, I choose to derive climate policy «output» from two sources: the policy component of the Germanwatch Climate Change Performance Index (Burck et al., 2013) and the index of political commitment to climate change mitigation developed by Bättig and Bernauer (2009). Both indicators have the advantage of seeking to evaluate policy performance, excluding emission trends, while providing ample variation among the countries included in the study. This is not least important given that the EU determines major aspects of the climate policies of most of the countries in the study.

Methods

The principal method to be used is cross-country comparison of average opinion scores for candidates and voters belonging to each major party, and of party sorting with policy output. T-tests will be used for assessing intergroup differences within each country, and Pearson's R will be employed to assess the strength and significance of correlations. To compare countries to each other and candidates to voters, left–right differences within each country on the various opinion variables will be calculated. They will generally express the average score for candidates and voters on the left minus the average score for candidates and voters on the right. The only exception is that for the purposes of comparing party sorting with climate

policy output, the absolute value of the distance between parties will be used rather than the raw difference. This is because climate policy output is conceptualized as a valence issue not related to the left–right scale.

Results

Candidate party sorting over the environment

Table 1 shows the differences between the two major parties of each of the 15 countries (16 party systems) in which the Comparative Candidate Survey has been conducted. I in nine of the cases, candidates for the left-of-centre party are significantly more in favour of environmental protection than their right-of-centre counterparts. This holds even in cases with few respondents, notably Denmark and the Netherlands. In the four remaining cases, there is no discernible difference between the two. In half of the countries, the difference is greater than one half of one standard deviation.

Country	Left	Right	Difference	p(T>t)	N
Switzerland	0.95	0.45	0.50	0	864
Denmark	0.86	0.48	0.37	0	55
Germany	0.75	0.52	0.23	0	708
Australia	0.85	0.65	0.21	0	157
Sweden	0.83	0.65	0.18	0	517
Iceland	0.72	0.53	0.19	0	128
Belgium (Fl.)	0.84	0.69	0.15	0	111
Portugal	0.90	0.76	0.15	0	211
Netherlands	0.77	0.65	0.12	0.04	53
Norway	0.84	0.73	0.11	0	277
Finland	0.72	0.63	0.10	0.016	147
Austria	0.75	0.69	0.06	0	382
Belgium (Fr.)	0.84	0.81	0.03	0.26	91
Ireland	0.80	0.79	0.01	0.44	196
Greece	0.93	0.92	0.01	0.37	79
Hungary	0.68	0.70	-0.01	0.64	213
Total	0.84	0.62	0.21	0	4189

Table 1. Candidate opinion on environmental protection by major party.

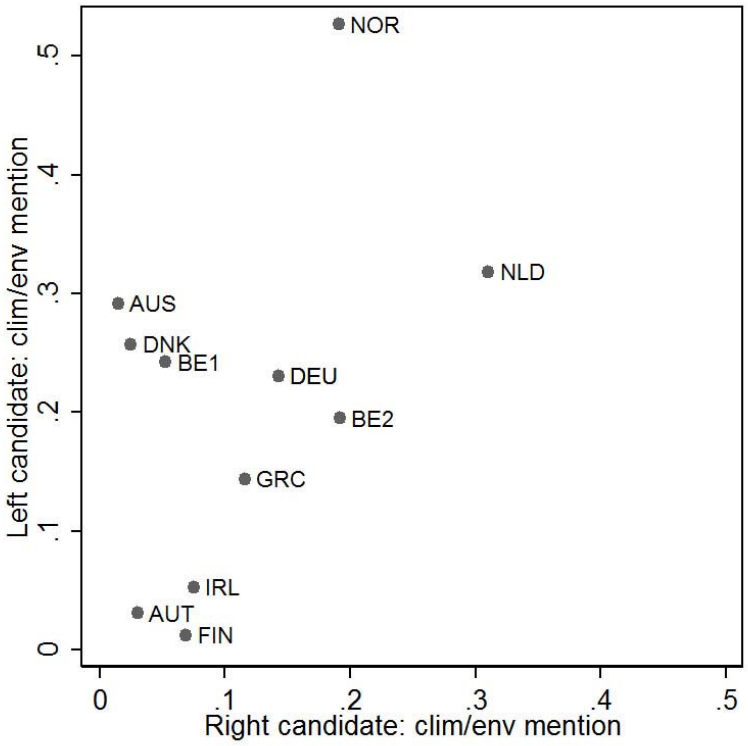
The table shows the mean environmental score by country and major party, with the difference and the T-test score assigned to the probability that the score for the party classified as «left» is higher than that for the party classified as «right».

Two conclusions may be drawn from this table. First, political disagreement between major parties over environmental issues is common. Second, such disagreement varies strongly between countries, as major party candidates in countries such as Ireland and Hungary show no discernible difference over environmental issues.

At the same time, Table 1 does not say how important environmental questions are to these candidates relative to other issues such as the economy, crime, and immigration. Specifically, supporting more environmental protection in an isolated survey question does not require prioritizing this issue over others, and support may thus be shallow.

By contrast, asking candidates to identify what they think are the three most important problems implies real prioritization. Figure 1 shows the difference in identification of climate change or the environment as a top-three concern by candidates of the left and right in the 11 party systems where this type of question was asked.[1] Note that the priority questions were not asked in uniform ways, with some studies reporting completely open answers and others answers categorized into groups provided by researchers. Cross-country comparison is therefore discouraged. Countries where no candidates mentioned climate change or the environment have been excluded from the graph for the same reason.

At the same time, comparison within countries shows that environmental concerns are emphasized equally by mainstream parties in countries such as Austria, Greece, and the Netherlands. By contrast, parties on the left put more emphasis on climate change and the environment in party systems such as Australia, Denmark, Flemish-speaking Belgium, Norway and to some extent Germany. In these cases, the difference between candidates on the «most important problem» dimension is statistically significant at conventional levels. In no country is a right-of-centre party significantly more pro-environment than that of the left, although Finland would be the strongest candidate for such a position. This ordering thus agrees relatively well with the variation in party sorting on climate change and the environment seen in Table 1.



1

Party sorting on climate change among voters

To what extent do voters for major agree or disagree on climate change? Table 2 shows differences between respondents who report having voted for one of the two major parties in each of the 22 party systems (21 countries) in the 2009 Eurobarometer study. The difference is largest in The Netherlands, Great Britain, and Denmark, where it is more than one-half of one point on the scale of climate concern ranging from zero to ten. In nine of the cases, the difference between the left and the right is statistically significant at the five per cent level in such a way that voters on the left are more concerned with climate change than voters on the right.

Specifically, respondents who report having voted for the British Conservatives, Dutch Christian Democrats, or Danish Liberals rate climate change as a significantly less serious problem than their compatriots who voted for the British or Dutch Labour party or the Danish Social Democrats, respectively. The difference in these cases lies between one-quarter and one-third of one standard deviation of the climate concern variable. Flemish-speaking Belgium, Italy, Portugal, France, Sweden and Greece display the same effect, but the magnitude is less.

By contrast, in five of the cases – Finland, Romania, Ireland, Poland, and French-speaking Belgium, voters on the right are on average more concerned about climate change than voters on the left. This difference does not, however, reach similar levels of significance as the nine cases where the left shows more climate concern. Finally, no difference is seen between voters on the left and right in the Czech Republic, Germany, Slovakia, Estonia, Slovenia, Spain, Austria and Hungary.

Table 2 thus confirms with voter data the findings from party candidates in Table 1 that party sorting over climate change and the environment varies substantially across countries.

Country	Left	Right	Difference	p(L>R)	N
The Netherlands	6.9	6.1	0.8	**.000**	456
Great Britain	6.7	6	0.7	**.001**	506
Denmark	7	6.4	0.6	**.001**	493
Belgium (Fl.)	7.1	6.6	0.5	**.039**	261
Italy	7.8	7.3	0.5	**.005**	365
Portugal	7.8	7.3	0.5	**.013**	395
France	8.2	7.7	0.5	**.004**	507
Sweden	7.3	7	0.3	**.048**	512
Greece	8.8	8.6	0.2	**.016**	544
Czech Republic	7.4	7.2	0.2	.11	492
Germany	7.8	7.6	0.2	.067	793
Slovakia	7.7	7.5	0.2	.11	401
Estonia	6.3	6.2	0.1	.32	417
Slovenia	8.7	8.6	0.1	.33	425
Spain	7.3	7.2	0.1	.53	542
Austria	7.2	7.2	0	.50	510
Hungary	8.3	8.3	0	.49	608
Finland	7.1	7.2	-0.1	.74	393
Romania	8	8.2	-0.2	.79	417
Ireland	7.1	7.3	-0.2	.91	531
Poland	7.1	7.3	-0.2	.74	476
Belgium (Fr.)	7.3	7.6	-0.3	.86	228
Total	**7.5**	**7.3**	**0.2**	**.000**	**10272**

Table 2. Voter concern about climate change by major party.

The table shows the mean climate concern by country and major party, with the difference and the T-test score assigned to the probability that the score for the party classified as «left» is higher than that for the party classified as «right».

How salient is climate as an issue to the same voters? Table 3 again shows the average differences between voters for major parties by country, this time on the binary indicator of whether the respondent chose climate change as one of three «major world problems» question. Again, the variation is substantial. Among the six countries where voters on the left show a significantly stronger tendency to pick climate change, five are also found among the countries with significant party sorting on the «climate seriousness» variable. Note, at the same time, that voters for parties on the right are significantly more concerned than voters on the left in two party systems: Finland and Francophone Belgium. The left thus has no monopoly on attention to climate change.

Country	Left	Right	Difference	p(L>R)	N
Denmark	0.67	0.54	0.13	**.001**	497
Sweden	0.88	0.76	0.13	**.0001**	514
Poland	0.39	0.28	0.11	**.010**	490
Netherlands	0.62	0.51	0.10	**.013**	458
Great Britain	0.49	0.39	0.10	**.014**	516
Italy	0.46	0.38	0.08	.072	375
Greece	0.72	0.64	0.08	**.030**	544
Portugal	0.29	0.22	0.07	.068	413
France	0.51	0.45	0.06	.094	514
Hungary	0.67	0.62	0.06	.078	610
Germany	0.67	0.66	0.01	.35	797
Romania	0.52	0.51	0.01	.41	460
Spain	0.44	0.44	0.01	.44	561
Czech Republic	0.32	0.32	0.00	.54	499
Belgium: Flemish-speaking	0.45	0.45	0.00	.52	263
Slovakia	0.55	0.55	-0.01	.54	408
Estonia	0.32	0.34	-0.02	.66	425
Slovenia	0.61	0.63	-0.02	.66	428
Ireland	0.57	0.59	-0.02	.70	542
Austria	0.61	0.66	-0.05	.89	518
Finland	0.57	0.67	-0.10	**.97**	394
Belgium: Francophone	0.52	0.68	-0.16	**.99**	228
Total	0.54	0.53	0.01		10454

Table 3. Voter mention of climate change as top three issue, by major party

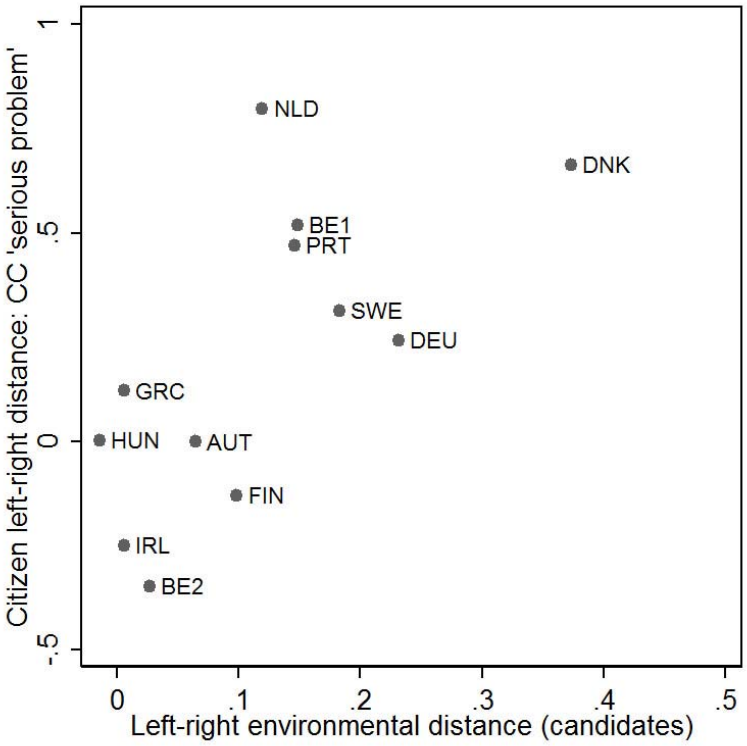
The table shows the propensity of respondents to nominate climate change as one of three most important policy issues, by country and major party, with the difference and the T-test score assigned to the probability that the score for the party classified as «left» is higher than that for the party classified as «right».

It is also possible to show that generic left–right placement has no independent, significant effect on climate concern or importance of climate change as a world problem (see Supplementary Table 1). This suggests that public opinion on climate change is influenced more by the communication of party leaders (cf. Brulle et al., 2012) than by individuals' initial ideological leanings.

Based on these two tables models, party sorting of climate change opinion appears stronger in countries in Northwest Europe overall, although exceptions such as Greece and Italy exist. This agrees with Nawrotzki's (2012) main finding. Furthermore, in a majority of countries there is little evidence of party sorting of climate change opinion. It should also be noted that in cases such as Finland and Francophone Belgium, the party differences in both tables indicate that citizens voting for the right-of-centre parties are relatively more concerned about climate change and mention it more often as a major world problem than their left-of-centre compatriots. The same is seen in Ireland, a special case since both the largest parties are right-of-centre.

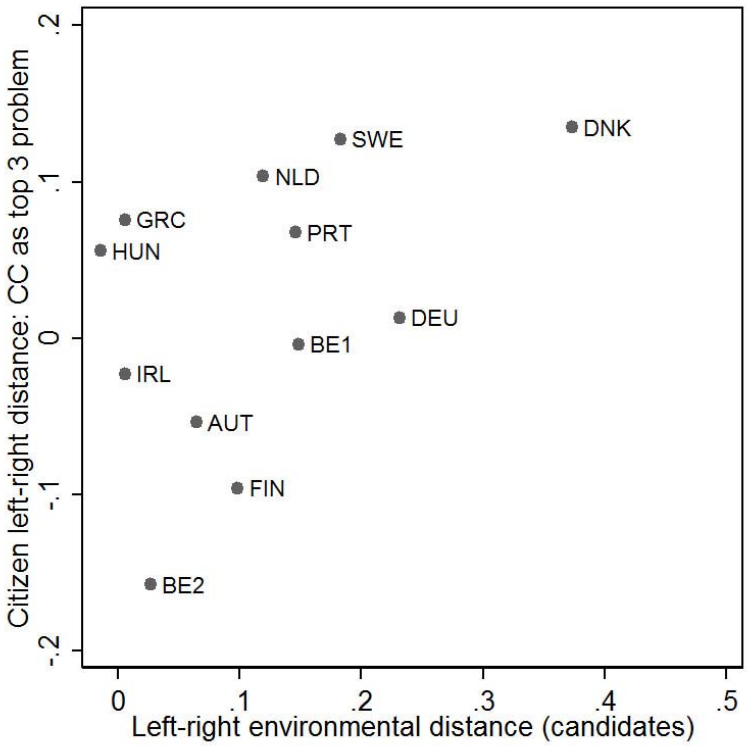
Is candidate party sorting correlated with voter party sorting?

The data so far have shown substantial variation in the degree of party sorting over climate change and the environment across a selection of developed countries. Hypothesis 1 above states that these measures should correlate, on the expectation that elite opinion drives public opinion on issues of this kind. To test the hypothesis, Figure 2 plots country averages of voter climate concern over country averages of candidate environmental opinion.



The relationship between the distances in opinion across voters and candidates is strong and significant (r=.67; p=.017; n=12), even with a low number of cases. Denmark and the Netherlands are found above the median on both measures, whereas Finland and the Francophone party segment of Belgium, where voters on the right are marginally (but insignificantly) more concerned about climate change than their fellow citizens on the left, have among the lowest distances between elected officials on the environmental dimension. The result remains strong and significant (r=.60, p=.050; n=11) even if Denmark is excluded. The finding also holds if Ireland is held outside the analysis because of its unusual party system dominated by two centre-right parties.

I find a similarly positive but not as strong result between candidate opinion and citizens' propensity to mention climate change as one of the three most serious world problems (r=.47; p=.13; n=12), see Figure 3. Sweden, which saw the second-greatest partisan mean difference on this measure, also scores third highest on the candidate distance measure. Thus, the pattern of the left–right distances at the party and voter levels shows that candidates and voters follow each other closely in terms of climate concern and opinion on environmental protection. The data are consistent with the expectation that party sorting among candidates drives party sorting among voters, although further research is needed to establish the causal direction.



Increasing party sorting over time?

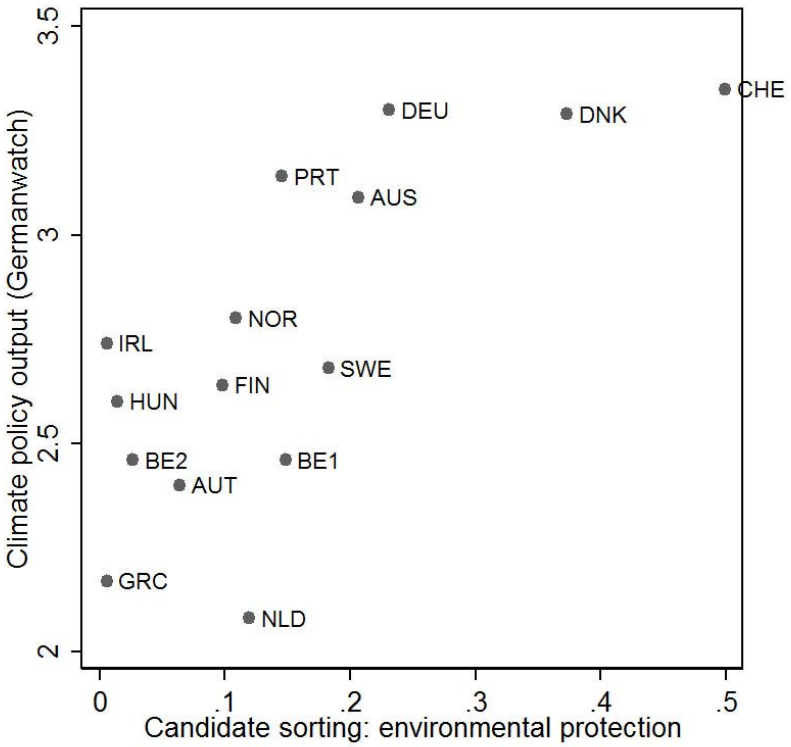
A prominent question in the party sorting literature is whether party positions are becoming more polarized, both generally (Fiorina and Abrams 2008) and as regards climate change (McCright and Dunlap 2011). The candidate data available to address whether such a polarization is taking place over environmental protection is limited to three countries: Switzerland, Germany and Portugal. These countries have candidate data over two election cycles.

The data show that the distance between Swiss major-party candidates increases moderately from .48 in 2007 to .52 in 2011. In Portugal, the change is minuscule, from .14 (2009) to .15 (2011). In Germany, the distance between the SPD and CDU/CSU contracts somewhat from .25 in 2005 to .21 in 2009. There is thus no conclusive evidence for increasing polarization on environmental issues in these countries.

Relationship between party sorting and climate policy

So far, I have shown ample variation in party sorting over climate change and environmental issues. To what extent does such party sorting correlate with climate policy? Hypothesis 2 above stated the expectation that greater party sorting over the environment and climate change would lead to less ambitious climate policy output.

Figure 4 shows the relationship between party sorting over the environment among major party candidates and the Germanwatch index component indicating national climate policy output. The relationship is positive and significant (r=.74, p=.0018, n=15). Removing the outlier Swiss and Danish cases reduces the relationship somewhat (r=.60, p=.03, n=13). Most importantly, however, the Germanwatch data show no negative relationship between party sorting and climate policy output, and thus go against Hypothesis 2.



It is also possible to show the correlation between the Bättig/Bernauer index and party sorting among voters on the degree of climate concern. Again, the relationship between party sorting and policy is positive, albeit weakly so (r=.29, p=.24, n=18) and thus also provides no support for Hypothesis 2.

Including the variable on party sorting over climate mention, it is possible to calculate six pairwise correlations between national climate policy output (two variables) and political party sorting over climate and the environment (three variables). All coefficients are positive, although they range from .078 to .74 in the Germanwatch case and from .0022 to .29 in the Bättig and Bernauer case. There is thus no evidence of public opinion party sorting holding back national climate policy. Indeed, a positive relationship between party sorting and policy output appears more in line with the data.

Discussion and conclusion

This article has shown ample variation in party sorting over climate change and the environment among candidates for political office across 15 party systems. In some countries, candidates for the largest left-of-centre party are more in favour of environmental protection than candidates for the main right-of-centre party. In other countries, there is no significant difference between the two sides.

The robustness of this finding is confirmed by similar patterns of party sorting among voters on the issue of climate change. Thus, it is very likely that the measure of party sorting shown in this article constitutes a good indicator of overall party sorting in the countries involved.

By contrast, the evidence does not support the expectation, common in the literature, that party sorting over climate change and the environment has a negative effect on climate policy output. The fear that intense partisanship generates resistance to change and long-term policy thus appears unfounded, at least in the European context. An alternative conjecture more consistent with the data is that relatively ambitious domestic climate and environmental policies produces more party sorting as its effects are being felt and constituencies both in favour and against such policies policy grows. Future research involving changes in candidate and voter opinion over time, as well as accounting for additional factors such as economic output, is needed to pursue this alternative hypothesis.

What is the significance of these findings, and what are their limitations? First, this article has established that partisan disagreement over climate change and the environment does not in itself lead to stalemate in the area of climate policy. Rather, the data are consistent with an approach acknowledging that the issue of climate change is both comprehensive and difficult. Questions about the scale, timing and fairness of domestic climate policy cannot easily be framed such that one is either «for» or «against» climate action. Different expectations for technological development and the possibilities of behavioural change make the issue even more complex.

Consequently, debate over climate change policy should be expected and welcomed. This is especially the case when various policies are starting to make themselves felt by the public and by affected interest groups. Winners and losers from various policy initiatives should then be expected to voice their preferences through political parties, amplifying public debate and likely contributing to party differentiation on various aspects of climate policy.

While disagreement and polarisation are healthy in a democratic society, also when it comes to climate and environmental policy, it remains important to distinguish between different types of disagreement. On the one hand there will be divergent opinions about what approaches to climate change are best – say, between technological fixes and nudging toward behavioural change. There are also differences in the degree to which party candidates and voters see climate change as a salient problem next to other issues such as the economy, health, and education.

On the other hand, some countries see ample divergence over whether climate change is happening, is largely human-made and constitutes an important problem. The latter type of party sorting is dramatically different from the former, as it denies climate change status as a policy problem that needs addressing. While this article has emphasized debates of the former kind, future research should examine more closely the differences in policy effects between party sorting over preferred climate change solutions and priority versus the effects of party sorting between science acceptance and denial.

While such differences of the structuring of disagreements may be essential, party sorting over climate change may also relate to acceptance of government intervention. In this context, candidates and voters on the left are likely to be more accepting of government intervention in the form of taxes and regulations often suggested as fundamental climate policy instruments. By contrasts, individuals preferring free-market approaches are less likely to accept these solutions, which in turn may inform views both on climate policy and climate science (Lewandowsky et al. 2013). Future research should examine whether candidates and voters on the left and right support different types of climate policy instruments. A possible hypothesis would be that individuals on the left are relatively more likely to embrace proposals to increase subsidies, say, for renewable energy and public transport, whereas individuals on the right may have a relatively stronger affinity for cutting subsidies, say, for fossil fuel consumption or meat production.

A natural next step in this line of research is to add more parties to the two largest in each country. It seems plausible that at least some of the variation in party sorting over climate change and the environment derives from the presence and

absence of either environmental or populist «niche» parties. Conducting such an analysis requires a considerable amount of work, however, as the potential complexity of the party landscape increases exponentially with the number of parties included.

A first step could be to substitute coalition partners for single parties as main actors on the left and right; a second step could be to control for the presence and strength of green parties in each of the party systems studied here. Examining the role of significant third (or fourth) parties such as the Irish Social Democrats and the Finnish Centre Party could also yield insights about the dynamics of party sorting in multiparty systems.

The direction of the causal link should also be elucidated further in future research. Generally, party sorting is by most observers seen as a top-down process, by which party leaders provide cues to party followers (Fiorina and Abrams 2008). Time-series data for three countries have been offered in this article, but more is needed for a robust analysis.

Finally, the methodological approach developed in this article to study party sorting comparatively may also be used on issues other than climate change and the environment. Research questions relevant to future research include whether the patterns of party sorting found on environmental issues also divide countries and parties on other issues such as immigration, health care and redistribution. Do different issues polarize major parties of the left and right in different countries, or is party sorting relatively constant across issues, varying more by country?

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References

Abramowitz, A.I. and Saunders, K.L. (2008) Is Polarization a Myth? *The Journal of Politics,* 70(02), 542–555.

Burck, J., Marten, F. and Bals, C. (2013) The Climate Change Performance Index: Results 2014. *Germanwatch* [online].

Bättig, M. and Bernauer, T. (2009) National Institutions and Global Public Goods. *International Organization,* 63(2).

Bättig, M.B., Brander, S. and Imboden, D.M. (2008) Measuring countries' cooperation within the international climate change regime. *Environmental Science & Policy,* 11(6), 478–489.

Brulle R.J., Carmichael J. and Jenkins J.C. (2012) Shifting public opinion on climate change: an empirical assessment of factors influencing concern over climate change in the US, 2002–2010. Climatic Change: 1-20.Carter, N. 2013. Greening the mainstream: party politics and the environment. *Environmental Politics,* 22(1), 73–94.

Detterbeck, K. and Hepburn, E. (2010) Party Politics in Multi-Level Systems. *In:* Erk, J. and Swenden, W. eds. *New Directions in Federalism Studies.* Routledge, 106–125.

DiMaggio, P., Evans, J. and Bryson, B. (1996) Have American's social attitudes become more polarized? *American journal of Sociology*, 690–755.

Dolšak, N. (2009) Climate Change Policy Implementation: A Cross-Sectional Analysis. *Review of Policy Research,* 26(5), 551–570.

Dunlap, R.E. and McCright, A.M. (2008) A widening gap: Republican and Democratic views on climate change. *Environment: Science and Policy for Sustainable Development,* 50(5), 26–35.

European Commission (2009) Eurobarometer 71.1: European Parliament and Elections, Economic Crisis, Climate Change, and Chemical Products, January–February 2009. GESIS

Fiorina, M.P., Abrams, S.A. and Pope, J.C. (2008) Polarization in the American Public: Misconceptions and Misreadings. *The Journal of Politics,* 70(02), 556–560.

Fiorina, M.P. and Abrams, S.J. (2008) Political polarization in the American public. *Annu. Rev. Polit. Sci.,* 11, 563–588.

Fiorina, M.P., Abrams, S.J. and Pope, J.C. (2006) *Culture War? The Myth of a Polarized America.* Longman.

Henry, L.A. and Sundstrom, L.M. (2010) Russia and the Kyoto Protocol: from hot air to implementation? *In:* Harrison, K. and Sundstrom, L. M. eds. *Global commons, domestic decisions: the comparative politics of climate change.* MIT Press, 105–137.

Iversen, T. and Soskice, D. (2013) The Political Economy of Mass Polarization in Advanced Democracies. *Annual Meeting of the American Political Science Association, Chicago, Aug 29–Sept 1.*

Kim, Y.M.*, et al.* (2013) Ambivalence Reduction and Polarization in the Campaign Information Environment The Interaction Between Individual-and Contextual-Level Influences. *Communication Research,* 40(3), 388–416.

Kvaløy, B., Finseraas, H. and Listhaug, O. (2012) The publics' concern for global warming: A cross-national study of 47 countries. *Journal of Peace Research,* 49(1), 11–22.

Lachapelle, E. and Paterson, M. (2013) Drivers of national climate policy. *Climate Policy,* 13(5), 547–571.

Lewandowsky, S., Oberauer, K. and Gignac, G.E. (2013) NASA Faked the Moon Landing—Therefore, (Climate) Science Is a Hoax: An Anatomy of the Motivated Rejection of Science. *Psychological science,* 24(5), 622–633.

Lorenzoni, I. and Pidgeon, N. (2006) Public Views on Climate Change: European and USA Perspectives. *Climatic Change,* 77(1–2), 73–95.

Mansbridge, J.*,* et al. (2013) *Negotiating Agreement in Politics*.

McCright, A.M. and Dunlap, R.E. (2011) The politicization of climate change and polarization in the American public's views of global warming, 2001–2010. *The Sociological Quarterly,* 52(2), 155–194.

Meguid, B.M. (2008) *Party competition between unequals: Strategies and electoral fortunes in Europe.* Cambridge University Press.

Nawrotzki, R.J. (2012) The Politics of Environmental Concern: A Cross-National Analysis. *Organization & Environment*.

Pekari, N., Rosset, J. and Lutz, G. (2013) Comparative Candidates Survey – 2005–2011 [Dataset – cumulative file]. Lausanne: Distributed by FORS – Swiss Centre of Expertise in the Social Sciences.

Poortinga, W.*,* et al. (2011) Uncertain climate: An investigation into public scepticism about anthropogenic climate change. *Global Environmental Change,* 21(3), 1015–1024.

Sabin, P. (2013) *The bet: Paul Ehrlich, Julian Simon, and our gamble over Earth's future.* New Haven, Conn.: Yale University Press.

Saul, U. and Seidel, C. (2011) Does leadership promote cooperation in climate change mitigation policy? *Climate Policy,* 11(2), 901–921.

Tranter, B. (2013) The Great Divide: Political Candidate and Voter Polarisation over Global Warming in Australia. *Australian Journal of Politics & History,* 59(3), 397–413.

Appendix: Parties in the study

Country	Left	Right
Australia	Labor	Liberal/National
Austria	SPÖ	ÖVP
Belgium (Flemish)	SP.A-Spirit	CD&V-NV
Belgium (Francophone)	PS	MR
Cyprus	AKEL	DISY
Czech Republic	CSSD	ODS
Denmark	SD	V
Estonia	EK	ER
Estonia	EK	ER
Finland	SDP	KOK
France	PS	UMP
Germany	SPD	CDU-CSU
Great Britain	Labour	Conservatives
Greece	PASOK	ND
Hungary	FIDESZ-KDNP	MSzP
Iceland	Coalition	Independence
Ireland	FG	FF
Italy	PD	PdL
Luxembourg	LSAP	CSV
Netherlands	PvdA	CDA
Norway	Ap	H
Poland	PO	PiS
Portugal	PS	PPD-PSD
Romania	PSD-PC	PD-L
Slovakia	SMER-SD	SDKU-DS
Slovenia	SD (ZLSD)	SDS
Spain	PSOE	PP

Sweden	SAP	M
Switzerland	SP/PS	SVP/UDC

Table A-1: Major parties identified as representing the right and left in each country.

Belgium has two party dyads: One Francophone and one Flemish-speaking. When more than one party appears in a cell, the relevant data are averaged to produce one data point per party per country. Individual parties are separated using semicolons.

Supplementary material

	Model 1		Model 2		Model 3	
Dependent variable	Climate concern (1–10)		Climate concern (1–10)		Climate mention (0–1)	
	Coefficient	Std. err.	Coefficient	Std. err.	Coefficient	Std. err.
Major party vote	-0.239***	0.060				
Gender	0.290***	0.067	0.262***	0.041	0.047	0.042
Age (years)	-0.007*	0.003	-0.004**	0.001	-0.008***	0.001
Informed about CC	0.631*	0.253	0.879***	0.090	1.163***	0.092
Urban	0.028	0.069	-0.001	0.052	0.040	0.053
Left–right self-placement	0.007	0.026				
Major right party binary variables, by country:						
France			-0.365*	0.186	-0.148	0.182
The Netherlands			**-0.777*** **	**0.194**	-0.365	0.192
Germany			-0.250	0.148	-0.049	0.153
Italy			-0.392	0.222	-0.148	0.221
Denmark			**-0.634*** **	**0.187**	**-0.592** **	**0.189**
Ireland			0.222	0.191	0.103	0.189
Great Britain			**-0.740*** **	**0.185**	**-0.426***	**0.184**
Greece			-0.090	0.177	-0.310	0.189
Spain			-0.090	0.190	-0.015	0.186
Portugal			-0.402	0.217	-0.267	0.243
Finland			0.132	0.209	0.370	0.212
Sweden			-0.356	0.182	**-0.970*** **	**0.245**

Austria			0.018	0.187	0.277	0.190
Czech Republic			-0.333	0.188	-0.084	0.196
Estonia			-0.159	0.204	0.044	0.211
Hungary			-0.013	0.169	-0.298	0.174
Poland			0.140	0.202	-0.378	0.208
Slovakia			-0.272	0.247	-0.004	0.243
Slovenia			-0.046	0.204	0.101	0.205
Romania			0.143	0.205	-0.260	0.196
Belgium (Flemish-speaking)			-0.480	0.283	0.068	0.279
Belgium (Francophone)			0.306	0.302	0.518	0.308
			Country fixed effects not shown			
Constant	7.082***	0.274				
R-squared	0.015		0.930			
N. of cases	9411		10178		10315	
* p<0.05, ** p<0.01, *** p<0.001						

Supplementary Table 1: The effect of major party vote on climate change opinion

Effects of most recent individual vote and selected demographic variables on levels of climate concern (Models 1 and 2) and mention of climate change as a major world problem (Model 3). Ordinary least squares regression is used in Models 1 and 2; logistic regression in Model 3. Parameters of particular interest are the regression coefficients on the binary (dummy) variables signifying that a respondent reports having voted for the major centre–right party of the given country. Only respondents voting for either the major centre–right or centre–left party, as enumerated in Table A-1, have been included in the models. Specifying the models with robust standard errors or clustering by country produces no substantive difference.

List of figures with captions

Figure 1: Candidate mention of climate/environment as top issue

The vertical axis expresses the share of candidates from the major centre–left party who mentioned climate change or the environment as one of the three most important problems facing their country. The horizontal axis expresses the same share for major-centre right candidates. The selected parties, two for each country, are given in Table A-1. Belgium's party system is split into two: One Flemish-speaking («BE1») and one Francophone («BE2»).

Figure 2: Candidate and voter party sorting over environmental protection and climate concern

The vertical axis expresses the average responses by country to a question about the seriousness of climate change by respondents having voted for a major centre–left party minus the average responses on the same questions by respondents having voted for a major centre–right party. The horizontal axis expresses the distance between average responses by candidates from the same parties on a survey question about preferences for environmental protection. The selected parties, two for each country, are given in Table A-1. Belgium's party system is split into two: One Flemish-speaking («BE1») and one Francophone («BE2»).

Figure 3: Candidate and voter party sorting over environmental protection and climate salience

The vertical axis expresses the average propensity of respondents having voted for a major centre–left party to mention climate change as a top 3 world problem minus the corresponding rate by respondents having voted for a major centre–right party. The horizontal axis expresses the distance between average responses by candidates from the same parties on a survey question about preferences for environmental protection. The selected parties, two for each country, are given in Table A-1. Belgium's party system is split into two: One Flemish-speaking («BE1») and one Francophone («BE2»).

Figure 4: Environmental opinion party sorting and climate policy output

The vertical axis expresses the national climate policy output component of the Germanwatch Climate Change Performance Index (Burck et al. 2013), where a

higher number means an assessment that implemented domestic climate policy is stronger. The horizontal axis expresses the absolute distance between average responses by candidates from the same parties on a survey question about preferences for environmental protection. The selected parties, two for each country, are given in Table A-1. Belgium's party system is split into two: One Flemish-speaking («BE1») and one Francophone («BE2»).