

# Leaders and Laggards: Climate Policy Ambition in Developed States

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## Abstract

In 1992 the United Nations identified twenty-four “Annex II” states as being “developed” and holding the greatest responsibility for reducing emissions. Since then, the ambitions of these states toward mitigating climate change have varied significantly. This article is the first to employ fuzzy-set qualitative comparative analysis (fsQCA) to analyze climate policy variation among the Annex II developed states. The presence of a left-wing government is shown to be sufficient for ambitious climate policy, as is having high GDP per capita in conjunction with close links to the EU and few political constraints. The analysis highlights Austria’s surprisingly unambitious climate policy, which is explained, following elite interviews, by the state’s unique social partnership governance model and unusual fuel tourism industry. Overall, fsQCA proves a useful method for examining variables in combination and for case study selection, although limited by the number of variables it can assess.

National policy ambition remains a cornerstone of global efforts to mitigate climate change. At the 2015 Paris Conference of the Parties (COP; see Dimitrov 2016), the submission of Intended Nationally Determined Contributions—climate change targets formulated by every state—underlined the role of state-level actors. The body that oversees these annual COPs, the United Nations Framework Convention on Climate Change (UNFCCC), was created in 1992 and identified twenty-four states, known as “Annex II,” as being economically developed.<sup>1</sup> These Annex II states—including France, Japan, and the US—were seen as holding the greatest capacity and obligation to reduce emissions. However, there has been significant variation in the levels of climate policy ambition exhibited within this group since 1992—for example, between the leading members of the European Union (EU) and the more laggardly US (Skjørseth

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1. Turkey was included as an original member but was removed in 2002; this study examines only the other twenty-three states.

et al. 2013). Why are some developed states more ambitious in their responses to climate change than others?

The literature seeking to explain climate policy variation is small but burgeoning (Bättig and Bernauer 2009; Bernauer and Böhmelt 2013; Lachapelle and Paterson 2013). Harrison and Sundstrom (2007) assessed the climate policies of developed states and those in transition, but no published article has analyzed the factors that explain variation within the Annex II group. Annex II is especially important since these states might be expected to formulate the most ambitious climate policies, because of their greater emissions and economic development; any deviation from such a performance could signal obstacles to mitigation that emerging economies might also face. To address this knowledge gap, fuzzy-set qualitative comparative analysis (fsQCA; see Ragin 2000; Schneider and Wagemann 2012) is employed here. This method of analysis enables variables to be assessed in combination to identify necessary and sufficient conditions, and it is effective at isolating individual case studies to be analyzed in greater detail (Ragin 2000; Ragin 2008; Schneider and Wagemann 2010; Schneider and Wagemann 2012). Indeed, Purdon (2015, 8) highlighted that assessments of necessity and sufficiency open up new possibilities for conducting small-*n* and medium-*n* research, which may be of use to comparative climate politics. Although fsQCA was used by Never and Betz (2014) to explain climate policy implementation among emerging economies, and by Sewerin (2014) to analyze the greenhouse gas emission trends of fifteen democratic states' administrations, it has not previously been employed to examine variations in the ambition of climate change *policy* or among the Annex II countries. QCA has become an increasingly popular research method in recent years (Braumoeller 2015, 472) but has also received criticism (see Krogslund et al. 2015 and the response by Rohlffing 2016).

My objective here is to assess factors in combination that may explain developed states' climate ambitions, as well as to identify a small number of cases that deserve further investigation as part of a nested analysis (Lieberman 2005). First I identify four important yet contested themes within the literature, and then go on to explain the fsQCA method and operationalize its causal conditions. The results demonstrate that a left-wing government alone is sufficient to produce ambitious climate policy. This finding suggests that climate change remains a party-identified political issue. Additionally, the combination of EU membership, high gross domestic product (GDP) per capita, and the absence of political constraints is also sufficient for a state to formulate ambitious climate policy.

I point out Austria as a particularly intriguing case, because its extremely low score for climate policy ambition contrasts with its previous reputation as an environmental leader. The analysis of why this should be is supported by eight elite semistructured interviews and identifies Austria's social partnership governance model and fuel tourism industry as obstacles that specifically hinder ambition toward climate change, but not the protection of the local environment.

I conclude with an argument that fsQCA offers a useful means of analyzing variables in combination and selecting cases for further investigation, but that it is limited by the number of variables it can assess.

## Theory

Even with increasing attention being paid to nonstate actors in the UNFCCC model (Hale 2016), national climate policy is of acute importance due to the state's primary roles in policy formulation and implementation and as a facilitator of global climate agreements (Purdon 2015, 5). A number of indices with differing components have been developed to measure variation in national climate mitigation policy ambition (e.g., Bernauer and Böhmelt 2013; Burck et al. 2008; World Wide Fund for Nature [WWF] 2011). Targets for future emission reductions are a defining feature of these efforts. Targets that go beyond windfall reductions and are greater than those created by similar states are, for the purposes of this article, defined as more ambitious. For instance, Ireland committed to a 20-percent reduction in emissions by 2020 based on 2005 levels, whereas Portugal's target was to limit emissions *growth* to 1 percent above 2005 levels (European Commission 2012). Additionally, policies that receive adequate funding, are legally binding rather than voluntary, feature specific targets for emission reductions rather than broad goals, and minimize the need to purchase carbon credits for meeting these goals are considered more ambitious.

Explaining variations in ambition, however, is challenging. Epistemologically, I agree with Christoff and Eckersley (2011, 444) that it is "near-futile" to find a small set of factors that shape climate policy. However, by seeking to do so, we can identify broad patterns that explain the outputs of a majority of developed states, and identify specific cases of interest for further in-depth analysis. Lachapelle and Paterson (2013, 555) suggest that political variables are of limited explanatory power regarding climate policy when examined on their own. Here, using fsQCA, my goal is to identify how variables can work in combination with one another to influence outcomes. As such, I identify four important themes (ideological, international, institutional, and economic factors) in the existing literature regarding impacts upon environmental policy ambition. In line with fsQCA practice (Schneider and Wagemann 2012, 296), explicit hypotheses were not developed for each theme. These themes deserve greater exploration because their impacts on policy ambition are contested in the existing literature.

Regarding the ideological theme, there is evidence that climate change may be championed by parties across the political spectrum. For instance, a traditional priority of left-wing parties is to support workers, even in environmentally damaging industries, which may make these parties resistant to certain environmental protection measures (Neumayer 2003). Meanwhile, parties on the political right that identify nature as sacred may favor environmental protection for religious reasons (Dietz et al. 1998, 465). For Carter (2013),

although left-wing parties do adopt more pro-environment positions, issue salience between left and right is only marginal and fluctuates over time. Similarly, Harrison (2007) suggests that partisanship offers at best only a partial explanation of the US-Canada divergence. However, the twin objectives of state-led economic policy and environmental protection do find much support on the left. Consequently, left-wing parties have been shown to be more supportive of environmental issues (Neumayer 2003). More recently, particularly in the US, it appears that party polarization on climate change has increased, with Republican politicians increasingly expressing climate-skeptic sentiments (Dunlap et al. 2016). Few of the Annex II countries have had Greens in parliament or government. As such, government partisanship on a left-right spectrum is assessed as a variable that may influence climate policy ambition.

Second, international factors may shape a state's climate or environmental policies. For Knill, Shikano, and Tosun (2014, 74), "the degree of institutional interlinkages of countries is the main determinant of environmental policy adoption." The EU is the most integrated international market in the world. Wurzel and Connelly (2011) suggest that international interlinkages correlate positively with environmental protection. In particular, during the seven-year period covered by the present analysis (2006–2012), the EU sought to build a "green myth" as part of its international identity (Lenschow and Sprungk 2009). In 2005, Jänicke found EU membership to be the most significant factor when explaining climate policy. Similarly, for Liefferink et al. (2009, 696), EU membership was the most powerful factor explaining a strong domestic environmental policy output. However, the EU's climate leadership has been hindered by a struggling emissions trading scheme, a comparative reduction in influence due to the rise of high-emitting emerging economies, and a Eurozone crisis that is hindering member states' ability to invest in climate policy (Skovgaard 2014). Indeed, Madden (2014, 581) finds that EU membership currently has a modestly negative impact on policy outputs, perhaps because of the volume of minor policies adopted by EU states. Thus, a state's relationship with the EU is the second variable I assess.

Third, institutional factors, particularly constraints (here also known as *veto points*; see Tsebelis 1999), within governance models have been identified as shaping environmental performance. Democracy has been highlighted as a particularly important explanatory factor for environmental ambition (Bättig and Bernauer 2009; Neumayer 2002). More specifically, corporatist states are identified as being more environmentally friendly, arguably due to the inclusion of potentially affected actors within the decision-making process (Jahn 1998; Liefferink et al. 2009; Scruggs 1999). Madden (2014) finds that having a greater number of veto points negatively affects climate policy adoption. Therefore, the degree of political constraints in a governance model is the third variable I investigate.

Fourth, several studies have shown that economic development is linked to environmental outputs (Börzel 2002; Liefferink et al. 2009). For example,

Jänicke (2005, 136–137) argues that the most important characteristic of green states is their high economic development. In the US, a rise in climate skepticism has been linked to the Great Recession (Scruggs and Benegal 2012). However, Madden (2014) argues that GDP per capita has had a modestly negative relationship with major climate policy adoption. For Bättig and Bernauer (2009, 298), economic growth (measured as GDP per capita) has no significant effect on policy output, and Kachi et al. (2015) have likewise shown that individuals' perceptions of their own economic situations have no significant effect on climate policy support. Lastly, Kim and Wolinsky-Nahmias (2014) find that a national population's attitude toward climate change is not straightforwardly related to national affluence. This uncertainty over the extent to which economic development—particularly among individuals—may influence climate policy ambition is the rationale for the fourth variable I investigate: GDP per capita.

## Method

### *Critique*

Despite the increasing numbers of studies that have used fsQCA, views of it have become increasingly polarized. Critics highlight the apparent existence of false positives (Braumoeller 2015), problems with multiconfigurational causality and temporality (Fischer and Maggetti 2016), an alleged inability to make causal claims via set-theoretic methods (Munck 2016), and failure to demonstrate why set theory offers distinct advantages over statistical modeling (Paine 2016). In response, proponents emphasize that the method rests upon different assumptions than statistical approaches do (Thiem et al. 2016), and they highlight alleged weaknesses in critical applications (Rohlfing 2016). I apply fsQCA in line with its proponents' best practices; the discussion highlights the apparent benefits and limitations of the method for analyzing comparative climate policy ambition. As such, I do not interpret the results as providing a definitive explanation of climate policy variation, nor do I argue that fsQCA is preferable to other approaches, such as regression analyses. Instead, fsQCA enables variables to be tested in combination, offers a robust means for case study selection, and is a nascent and high-profile approach that has yet to be applied to the important issue of climate policy variation. Thus, fsQCA may complement other methods, such as regression analyses, as part of a pluralistic methodological approach.

### *Application*

Ragin (2000, 222) warns that “when causation is complex, no single cause may be either necessary or sufficient” to explain an outcome. In response, fsQCA is used to identify necessary and sufficient factors by examining conditions in combination (“configurations”), as well as in isolation (Schneider and

Wagemann 2012, 296–297). The objectives of this article are to assess factors in combination that may explain developed states' climate ambitions and to identify cases that deserve further investigation from this larger set, via a process known as “nested analysis” (Lieberman 2005). The fsQCA approach is based on set theory and built upon Boolean algebra, and it enables cases to be graded on either a categorized or a continuous scale from 0 to 1 (Ragin 2000, 292–294). After scores have been allocated, the presence of necessary and of sufficient conditions is assessed separately (see Schneider and Wagemann 2012). Necessary conditions are rarely identified in the social sciences.

As part of the sufficiency assessment, truth tables list every possible configuration. Due to the large number of theoretical combinations, certain configurations, known as “logical remainders,” may not be found empirically, in a situation known as “limited diversity” (Ragin 2000, 107).<sup>2</sup> Due to this phenomenon, the total number of possible configurations should be similar in number to the quantity of cases under examination. This constraint limits the number of conditions that may be employed. For a medium-*n* analysis of twenty to forty cases, it is suitable to employ four conditions (Berg-Schlosser et al. 2009). This methodological limitation represents a weakness of fsQCA; while researchers must rationalize why certain conditions should be selected, complex phenomena are shaped by many factors. Moreover, this limitation contrasts with the principle that methods should not drive theoretical decisions (King et al. 1994).

When researchers interpret results, each solution pathway features scores for “consistency” and “coverage,” which are calculated differently according to whether necessity or sufficiency is being assessed. In both cases, “consistency” refers to the degree to which the cases that share a causal configuration will result in the outcome (see Ragin 2008, 44). Perfect consistency is almost impossible, due to the sheer number of potential variables involved in determining an outcome. The established threshold within the literature for the minimum consistency threshold for a sufficient condition or configuration of conditions is 0.75 (Ragin 2008, 46). “Coverage” assesses the extent to which the causal configuration accounts for empirical instances of the outcome. Ragin (2008, 45) notes that “just as it is possible in correlational analysis to have a significant but weak correlation, it is possible in set-theoretic analysis to have a set relation that is highly consistent but low in coverage.” Coverage is divided into two scores. “Raw coverage” denotes the extent to which all of the cases in the outcome are explained by a single solution pathway; “unique coverage” highlights the extent to which cases are explained *uniquely* by an individual solution pathway (Schneider and Wagemann 2012, 332–334). Finally, it is recommended that configurations resulting in the *negation* of the outcome—here, “not ambitious” climate policy—also be examined (Schneider and Wagemann 2010, 12).

2. When using fsQCA software (Ragin et al. 2006), these logical remainders are then deleted from the truth table.

## Operationalization

The operationalization of the outcome and each condition are listed below, with the scores for each case shown in Table 1. The most recent data available for the outcome and conditions cover 2006 to 2012, inclusive. This period

**Table 1**  
Data Matrix of the Cases, Outcome Scores, and Causal Conditions

<i>Cases</i>	<i>Outcome</i>				
	<i>Ambitious Climate Policy (ambclimpol)</i>	<i>Left-Wing Government (leftgov)</i>	<i>EU Membership (eumember)</i>	<i>Political Constraints (polcon)</i>	<i>High GDP per Capita (highgdp)</i>
<i>State</i>					
Australia	0.46	0.75	0.00	0.22	0.84
Austria	0.00	0.43	1.00	0.62	0.83
Belgium	0.40	0.36	1.00	1.00	0.69
Canada	0.00	0.00	0.00	0.00	0.74
Denmark	0.93	0.14	1.00	0.41	0.86
Finland	0.45	0.32	1.00	1.00	0.67
France	0.92	0.07	1.00	0.90	0.51
Germany	1.00	0.29	1.00	0.72	0.70
Greece	0.24	0.36	1.00	0.30	0.15
Iceland	1.00	0.64	0.66	0.81	0.73
Ireland	1.00	0.21	1.00	0.56	1.00
Italy	0.09	0.25	1.00	0.31	0.45
Japan	0.03	0.07	0.00	0.77	0.38
Luxembourg	0.37	0.50	1.00	0.79	1.00
Netherlands	0.29	0.25	1.00	0.84	0.99
New Zealand	0.18	0.39	0.00	0.02	0.25
Norway	1.00	0.75	0.66	0.89	1.00
Portugal	1.00	0.79	1.00	0.08	0.00
Spain	0.50	0.82	1.00	0.00	0.33
Sweden	1.00	0.11	1.00	0.32	0.81
Switzerland	0.74	0.25	0.66	0.34	1.00
UK	1.00	0.64	1.00	0.30	0.53
US	0.00	0.00	0.00	0.30	1.00

concludes twenty years after the creation of the Annex II category, providing adequate time for each state to assume a clear policy position on climate change. Furthermore, it represents a key period in contemporary climate policy, as it covers three years on either side of the landmark yet broadly ineffective Copenhagen COP in 2009. The raw data for each of the conditions are included in the online supplementary file (S2 to S4),<sup>3</sup> except for EU membership, because this condition is not derived from raw data.

### *The Outcome*

First, to translate the highly complex policy positions that determine the “ambition” of climate change policy into an fsQCA scale, data are drawn from the annual Climate Change Performance Index (CCPI) developed by Germanwatch and CAN International (e.g., Burck et al. 2008). Although the CCPI analyzes a variety of indicators, I used only the scores for national climate policy, provided by the authors of the index. The CCPI has been criticized by Bernauer and Böhmelt (2013) because its scores are drawn from a large range of experts via a questionnaire. However, their suggested replacement, the Climate Change Cooperation Index, is less preferable here, because its data end in 2008 and its policy components relate to international engagement, such as ratification of the UNFCCC, rather than to domestic policy details, such as emission reduction targets. The data employed by Lachapelle and Paterson (2013) are also less suitable here, since they analyzed policy according to instrument type rather than the ambition of the targets developed. To assess the reliability of the CCPI coding, I compared its findings with the WWF Climate Policy Tracker (CPT), which was conducted only in 2010 and 2011 and applied to only fifteen of the twenty-three Annex II states. The CPT scale was alphabetical, from A to G, but only the grades D to F were allocated. The comparison of the grades is included in the supplementary file (S1). France, Portugal, and the UK were noticeably more ambitious in the CCPI than in the CPT, but otherwise the CCPI and CPT reveal the same four states to be more ambitious, and the other eight less so.

As such, the states were graded using the CCPI, such that 1 equaled “ambitious climate policy” and 0 denoted “not ambitious climate policy,” and an average score for each state for the period was assigned. When the cases’ average climate policy scores were plotted in order of value, Canada and the US were significantly lower than the rest; thus the next lowest case, Austria, was selected as the threshold for 0. This calibration process is established practice (Ragin 2008) to ensure that unusually low scores do not skew the overall fuzzy-set scale. Similarly, a high-scoring group comprising Germany, Iceland, Portugal, Sweden, and the UK was far higher than the other cases. The next highest

3. See all the supplementary files at: [http://www.mitpressjournals.org/doi/suppl/10.1162/GLEP\\_a\\_00433/suppl\\_file/GLEP\\_a\\_00433\\_supp.pdf](http://www.mitpressjournals.org/doi/suppl/10.1162/GLEP_a_00433/suppl_file/GLEP_a_00433_supp.pdf).

cases—Ireland and Norway (which received the same score)—were therefore graded as the threshold for 1. The other states were then graded on a continuous, linear scale.

### *The Conditions*

To score the partisanship of states' governments, I used the coding by Armingeon et al. (2015) of OECD states from 1960 to 2013 as part of the Comparative Political Data Index (CPDI). These data use the Schmidt index to grade states' cabinets according to their political makeup, resulting in a 1–5 scale, in which 1 represents no left-wing representation in the government, and 5 represents no right-wing representation (see Schmidt 1996). The scores were averaged for 2006 to 2012 and then translated directly into an fsQCA score, whereby 1 represented a left-wing government and 0 represented a non-left-wing government.

EU membership can be coded relatively simply, with 0 for nonmembers and 1 for members. However, the three states that are not members of the EU but are members of the European Free Trade Association (EFTA) in Annex II—Iceland, Norway, and Switzerland—might be expected to formulate more ambitious environmental legislation to facilitate trade. These three states were therefore coded as 0.66 on a three-point fsQCA scale (0, 0.66, and 1), reflecting that they are not full members of the EU but work closely with the organization on many issues and are subject to the contents of the body of EU law, the *acquis communautaire*.

Political constraints were coded using the Political Constraint Index (POLCON) dataset (Henisz 2012), which builds upon the work of Henisz (2002). The dataset codes the presence of constraints within states, such as an additional chamber in the legislature, the dominance of a rival party within the legislature, and the homogeneity of parties in opposition, among other factors. Political constraints are coded 1, whereas the absence of constraints is 0. When the averages from the POLCON data were plotted, Spain's score was distinctly lower than the rest of the states, so the next lowest score, accorded to Canada, was coded 0. The political constraints of Belgium placed it significantly above the other states; as such, Finland's score, the next highest, was selected as the threshold for 1, with a continuous linear scale formulated from Canada to Finland.

Finally, GDP per capita, sourced from OECD (2015), in US dollars at constant prices and purchasing power parities, with a reference year of 2010, operationalized the economic theme. These data were averaged for 2006 to 2012 so as to find a value for the seven-year period. When plotted in order, the US, Switzerland, Norway, and Luxembourg were significantly higher than all of the other states, so Ireland's next-highest score was selected as the threshold for 1. No grouping of states toward the bottom of the scale was significantly lower than the others, so the lowest GDP per capita value in the set, that of

Portugal, was coded 0. The other states' scores were then calibrated along a continuous linear scale between the scores accorded to Portugal and Ireland. All the coding is shown in Table 1.

## Results and Discussion

Two separate analyses were conducted to ascertain necessity and sufficiency. As expected, none of the causal conditions passed the 0.9 necessity threshold (Schneider and Wagemann 2012, 143). EU membership came very close to such a definition, with a score of 0.89, whereas the other three conditions scored below 0.8. Furthermore, no conditions were necessary for the *negation* of the outcome, a “not ambitious” climate policy. Both sets of results are included in the supplementary file (S5 and S6).

Of the sixteen theoretically possible causal configurations that might be sufficient for ambitious climate policy, six were logical remainders, and ten were found empirically (S7). The minimum consistency threshold for each of the solutions was 0.75, as is recommended in the literature (Ragin 2008, 46). Here only the parsimonious solution is reported, as is common in the literature (e.g., Sutton and Rudd 2015); parsimonious solutions include all logical remainders without evaluation of their plausibility.<sup>4</sup> The solution provides two pathways that are sufficient for ambitious climate policy in developed states (Table 2). Both pathways are above the 0.75 threshold. The overall solution coverage is 0.67. More importantly, the overall solution consistency, 0.82, is also over the 0.75 threshold. These high scores are significant: the solution is strongly consistent and covers a large number of the cases.<sup>5</sup>

The analysis showed that Germany, Iceland, Ireland, Norway, Portugal, Sweden, and the UK formulated the most ambitious climate policies within Annex II between 2006 and 2012, supporting existing research arguing that these European states, and particularly Germany, Sweden, and the UK, are climate leaders (Bernauer and Böhmelt 2013; Jänicke 2005; Skjærseth et al. 2013; Tobin 2015). Future empirical studies of climate policy leadership would be well served by examining these seven states. In contrast, Austria, Canada, and the US were found to be the least ambitious. Austria's surprising inclusion in this group of laggards, having previously been an environmental leader (Börzel 2002), is explored below in a single case study analysis.

4. The complex and intermediate solution pathways are identical and are also provided in the supplementary file (S8).
5. It is prudent to also consider the solutions that are sufficient for the negation of the outcome (see Schneider and Wagemann 2010, 12). Only one solution pathway is sufficient to result in a climate policy that is not ambitious, which was identified by the complex, parsimonious, and intermediate solutions: with a consistency score of 0.89, the combination of non-EU membership, nonpolitical constraints, and a non-left-wing government is sufficient for nonambitious climate policy. This solution pathway has a raw and unique coverage score of 0.29 and is included in the supplementary file (S9 and S10).

**Table 2**

Sufficient Solution Pathways for Ambitious Climate Policy

<i>Solution Pathways</i>	<i>Consistency</i>	<i>Raw Coverage</i>	<i>Unique Coverage</i>
leftgov	0.80	0.53	0.31
eumember AND highgdp AND not polcon	0.86	0.36	0.13

The overall solution coverage is 0.67, and the overall solution consistency is 0.82.

No condition was found necessary for either ambitious or “not ambitious” climate policy. This finding is important, as it suggests that any state can be a climate policy leader. Climate policy ambition was found to be “equifinal”; that is, two solution pathways were sufficient for ambitious climate policy. Schneider and Wagemann (2012, 281) recommend highlighting which cases in particular are explained or not explained (as is common in fsQCA, hence the scores for coverage) by the overall sufficiency solution. Table 3 divides the states into six possible categories, according to the outcome and the presence of solution pathways, and lists the cases that were explained by each pathway.

**Table 3**

Extent to Which State Positions Are Explained by the Sufficient Solution Pathways

<i>Outcome</i>	<i>Solution Pathway</i>	<i>States Covered</i>
Ambitious climate policy	leftgov	Iceland, Norway, Portugal, the UK
Ambitious climate policy	eumember AND highgdp AND not polcon	Denmark, Sweden, Switzerland, the UK
Ambitious climate policy	Neither sufficient solution pathway	France, Germany, Ireland
Not ambitious climate policy	Neither sufficient solution pathway	Austria, Belgium, Canada, Finland, Greece, Italy, Japan, Netherlands, New Zealand, the US
Not ambitious climate policy	leftgov	Australia
Not ambitious climate policy	eumember AND highgdp AND not polcon	None

### *Unexplained Cases*

Luxembourg and Spain were omitted from the analysis due to their scores of 0.5 for left-wing government and climate policy ambition, respectively. Of the remaining twenty-one states in the analysis, four cases were not explained by the analysis, as is common in fsQCA analyses. France, Germany, and Ireland formulated ambitious policy but possessed low scores for left-wing government and high scores for political constraints, and thus were not explained by either solution pathway. As such, further research will be needed to explain the ambitious climate policies of these three states. The fourth unexplained state, Australia, possessed a left-wing government for the period but did not formulate ambitious climate policy. Australia's governing center-left Labor Party sought to create an emissions trading scheme in 2009, only for the Liberal Party and the Green Party to block the bill in the Senate, in the latter party's case due to the proposal's *lack* of ambition (Curran, 2011). Thus, the finding that left-wing government facilitates ambitious climate legislation is supported by four cases (Iceland, Norway, Portugal, and the UK, explored below), whereas Australia provides an unusual example of how climate legislation can be blocked by a Green Party for not being ambitious enough, thus highlighting the need for further research into the role of green parties.

### *Solution Pathway 1*

The finding that having a left-wing government is sufficient for ambitious climate policy helps explain the ambitious policy of Iceland, Norway, Portugal, and the UK. For instance, it was under a center-left Labour government that the UK passed its world-leading Climate Change Act in 2008. Carter and Jacobs (2014) found that party competition, particularly "competitive consensus" driven from the left, enabled the creation of this pioneering legislation. This explanation may be applicable to other developed states; left-wing parties may be challenged by green parties from the left and by pro-environment center parties on the right. Left-wing government is only a sufficient, rather than necessary, condition, meaning that right-wing governments may also formulate ambitious climate policy, as demonstrated in this study by Denmark, France, Germany, Ireland, Sweden, and Switzerland. The US and Canada, which scored 0 for both left-wing government and ambitious climate policy, highlight the prevalence of climate change skepticism on the political right in these states (Dunlap et al. 2016). Our finding is noteworthy, since few empirical studies conducted previously have explored the impact of ideological factors on climate policy across a medium-*n* number of states. Indeed, the identification of left-wing government as individually sufficient for ambitious climate policy challenges Lachapelle and Paterson's (2013, 555) argument that political variables are of limited explanatory power regarding climate policy when examined on their own. This contrast may be due to Lachapelle and Paterson's investigation having explored

broader political factors, such as the presence of democracy, rather than the partisan position of governing parties.

### *Solution Pathway 2*

EU membership plays a strong role in determining climate policy ambition, since it received a high score for necessity and was featured alongside high GDP per capita and the absence of political constraints in the second sufficiency solution pathway. This solution pathway helps explain the ambitious climate policies of Denmark, Sweden, Switzerland, and the UK (the latter being explained by both solution pathways). Climate change was a flagship issue for the EU in the first half of 2006–2012, as it provided a means for the bloc to assert a global identity (Wurzel and Connelly 2011). Since this period, however, the Eurozone crisis may have reduced the salience of climate change within the EU (Burns and Tobin 2016; Skovgaard 2014). Further research should be conducted on the impact of the crisis on climate policy in Europe since 2012. Moreover, EU member states also ranged in their scores for climate policy ambition from 0 to 1, highlighting the importance of the two other conditions as additional necessary factors within the pathway.

The role of political constraints adds further nuance to Christoff and Eckersley's (2011, 444) claim that "[t]he veto player thesis can illuminate why some states are climate laggards but it cannot explain why some states emerge as climate leaders." Madden (2014) emphasizes the importance of veto points to climate policy in his study of twenty-three OECD states. The present article furthers that work by arguing that states with high scores for political constraints may still be climate leaders—for instance, Iceland and Norway—if they possess left-wing governments. High GDP per capita is the third necessary component of the second sufficiency solution pathway. As states become wealthier, there may be greater pressure from increasingly postmaterialist citizens to create more ambitious climate legislation (Recchia 2002). This finding challenges existing research that has shown economic factors to have limited effect on climate policy ambition (Bättig and Bernauer 2009; Kachi et al. 2015; Kim and Wolinsky-Nahmias 2014). Importantly, as only developed states were included in this study, emissions may not have been reduced, but simply produced elsewhere, most likely in emerging economies (Stern 2004). As such, further research will be needed to ascertain whether increases in GDP per capita improve climate policy when all states are examined, beyond the Annex II grouping.

### *Case Study Selection: Austria*

Ten states qualified for neither solution pathway and also did not formulate ambitious climate policy, thus supporting the two sufficient-solution pathways. Among these states, only Austria, Canada, and the US were graded 0 for climate policy ambition. Previously seen as an environmental pioneer (Börzel 2002),

Austria represents a puzzling case to explain. Austria's lack of ambition may be explained by the inapplicability of either solution pathway, but the reasons for its starkly low score of 0, which was much lower than those of other European laggards, such as Belgium and the Netherlands, are unclear. Eight semistructured interviews (Appendix I) were conducted in February 2014 with Austrian policy-makers to assess and explain the state's apparently low climate ambition.

Supporting the findings, one Green Party politician (interview 8), argued that Austria's climate policy over the period was "not ambitious at all." In 2006, funding for an existing feed-in tariff (FIT) scheme was cut from €260 million a year to €17 million a year (Lofstedt 2008, 2230). Moreover, in 2005, one year before the period under investigation, Austrian greenhouse gas emissions were 26 percent above 1990 levels, far above the Kyoto Protocol target of a 13 percent *reduction* over 2008–2012 (International Energy Agency [IEA] 2007, 25). As such, the state's target under the EU Climate Package for 2013–2020—a 16 percent reduction to these high 2005 levels—cannot be considered ambitious when compared to pioneering European states. For example, Sweden committed to a 17 percent reduction on 2005 levels, having already reduced emissions significantly since 1990 (European Commission 2012). It appears, therefore, that Austria was a laggard during 2006–2012, supporting the coding in this analysis and adding confidence to the reliability of the coding of the other states. What explains Austria's U-turn on its FIT scheme and its unambitious greenhouse gas mitigation targets? Two key factors were identified by the interviewees.

Austria's unique social partnership (*Sozialpartnerschaft*) corporatist governance model comprises three chambers—Agriculture, Commerce, and Labor—plus the Trade Union Federation, which is a *de facto* member. The social partnership is designed to provide these varied interest groups with more direct access to policy-making (Pelinka 1987). In 2004, an "alliance of payers," comprising all four units of the social partnership, demanded a significant reduction in the value and quantity of FITs, arguing that the international competitiveness of Austria was being jeopardized (Brand and Pawloff 2014, 788–790). While the Labor Chamber and unions depicted FITs as increasing electricity bills to poorer Austrians, the Commerce Chamber perceived technological renewables as an extra cost for business. The only pro-environment voice in the social partnership was the Chamber of Agriculture, but, wishing to support rural voters, it favored subsidies for biofuels rather than FITs for wind or solar power. Thus, none of the chambers favored FITs for renewables, and they lobbied hard and effectively for the reduction in funding to the scheme. Since the production of nuclear energy had been banned following a referendum in 1978 (Martinovsky and Mareš 2012, 349–350), the weakening of FITs ensured that the state remained dependent upon coal (9 percent), oil (2 percent), and gas (20 percent) for its electricity production in 2010, hindering its ability to pursue ambitious climate policies (IEA 2014).

Second, Austria's greenhouse gas emissions are elevated by another distinctively Austrian phenomenon. Fuel tourism (*Tanktourismus*) was identified

as a key obstacle to ambitious climate legislation: consumers from neighboring states, particularly Germany and Italy, purchase vehicle fuel in Austria because of its central location and deliberately low fuel prices. Both members of the grand coalition government since 2006 favored the practice, such that “by the late 2000s Austrian fuel taxes had failed to keep pace with larger increases in many neighbouring countries” (Wurzel et al. 2013, 145). During the period considered here, 25–28 percent of motor fuel sales in Austria were attributed to fuel tourism (IEA 2014, 78). As the sales were made within Austria’s borders, they counted toward Austrian emissions, rendering road transport the state’s second-highest source of emissions (IEA 2014, 43). Thus, Austria failed to meet its Kyoto Protocol emissions reduction target for 2008–2012 and was required to buy €700 million of carbon credits to make up the shortfall. Yet, with fuel tourism generating around €1.3 billion each year (Steurer and Clar 2015, 100), the practice was continued throughout 2006–2012. As such, although Austria possesses ambitious policies that protect its *local* environment, the economic appeal of fuel tourism and the lack of a pro-climate voice in the social partnership have inhibited its *transboundary* environmental ambitions. These findings underscore the challenge of addressing climate change even in “pro-environmental” states and undermine Austria’s previous status as an environmental leader.

### *The Utility of fsQCA to Comparative Climate Politics*

As well as an empirical contribution, this article provides some insights into the suitability of fsQCA for measuring climate policy variation. First, by examining conditions in combination, the approach provides a more nuanced understanding of the ways in which variables that affect climate policy can interlink—as shown by the second solution pathway. Second, the method is an effective tool for case study selection (Lieberman 2005), as demonstrated by the identification and subsequent exploration of Austria as a perplexing case, which, once analyzed, supported the coding employed earlier in the analysis and provided new empirical data. However, a particular limitation of fsQCA is its inability to assess a large number of conditions and thus avoid limited diversity, dictated by the number of conditions under investigation. Although proponents of the method argue that this requirement underscores the importance of qualitative knowledge by the researcher(s) on a subject area, this limitation is particularly challenging when seeking to explore a topic as complex as variation in climate policy ambition.

## **Conclusions**

This is the first analysis of climate policy variation within the Annex II group of states, as well as the first to use fsQCA to explain climate policy variation. This investigation has analyzed conditions derived from four contested themes in the literature to find patterns that explain wide variations in climate policy

ambition among developed states. No condition was found necessary for either ambitious or not-ambitious climate policy over 2006–2012, suggesting that any state may be a pioneer, should it wish to pursue pro-climate policies. Climate policy was found to be a partisan issue, with the presence of a left-wing government alone being sufficient to result in ambitious climate policy. The importance of examining variables in combination was demonstrated by the finding that EU membership, high GDP per capita, and fewer political constraints are sufficient, in conjunction, to predict ambitious climate policy. Future research should be directed toward exploring further variables that may affect climate policy variation and examining a wider number of cases beyond developed states. France, Germany, and Ireland should be explored in further detail, to explain why they formulated more ambitious climate policy despite fitting within neither solution pathway. A case study was selected to follow up on the fsQCA, as is good practice, and Austria's unambitious climate policy was attributed to its unique social partnership governance and pursuit of fuel tourism, which between them explain the state's lack of climate policy ambition but continued commitment to the local environment. Finally, fsQCA was found to be an effective method for analyzing variables in combination and for selecting case studies worthy of further research, but the approach is limited by its inability to assess a large range of variables.

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## Appendix

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- Interview 1: NEOS Party of Austria employee, 11.02.14.
- Interview 2: Chamber of Agriculture of Austria employee, 11.02.14.
- Interview 3: Klimafonds of Austria employee, 12.02.14.
- Interview 4: Two Energy Agency of Austria employees, 21.02.14.
- Interview 5: Ministry of Agriculture, Forestry, Environment and Water Management employee, 13.02.14.
- Interview 6: Chamber of Agriculture of Austria employee, 14.02.14.
- Interview 7: Economic Chamber of Austria employee, 14.02.14.
- Interview 8: Green Party of Austria MP, 18.02.14.
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