

Comparing the Material and Political Determinants of Cooperation
in the International Climate Regime

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Submission Date: 7/18/2012

Introduction

Climate change is one of the most pressing issues on a global scale facing policymakers, and its impacts are increasingly affecting natural and man-made systems.¹ As a transnational and intertemporal policy issue, it is often acknowledged that climate change requires a global response. Climate change is a classic “tragedy of the commons”: states face material incentives and no repercussions from adding to the level of greenhouse gases (GHGs) in the atmosphere, unless some sort of global governance is instated. Furthermore, as carbon dioxide is removed from the atmosphere over a period of 20-200 years, the benefits of action taken and financed now will not be experienced until the future. National political and economic organizations, in which future benefits beyond election and business cycles are heavily discounted, are poorly equipped to deal with this intertemporal aspect of climate change.

The international community, however, has not been particularly adept in its response. Since the United Nations Framework Convention on Climate Change (UNFCCC) was produced at the Rio de Janeiro Earth Summit in 1992, states have varied widely in their support for the regime and its principal update, the Kyoto Protocol. Some developed nations, notably those in Western Europe, have committed themselves to ambitious reductions of GHGs and called on other states to do so, whereas others have refused to ratify the Protocol or to a second commitment period, or renounced commitments already made. At the 17th session of the Conference of the Parties in Durban in 2011, member states agreed to continue negotiations toward an agreement that would include all nations and would be finalized by 2015. As the period between now and 2015 will be a critical time in determining long-term policy outcomes, the question of what motivates states’ cooperation is of key import.

The factors influencing states’ actions in the international realm are complex and multidirectional. While the conventional view of international relations scholarship is that states seek to maximize their material interests,² political science and political economy scholarship has demonstrated how domestic political factors also explain states’ actions at the international level.³ The goal of this paper is to identify which between material and political determinant have played a greater role in determining states’ levels of cooperation in the international climate regime. It seeks to answer the question: can states’ levels of cooperation be more readily explained by their material interests, or more by their domestic political institutions and circumstances?

An empirical study by Harvard professor Paul Bodnar found only weak correlation between states’ material interests and their cooperation in the global climate regime (Bodnar, 2004). This provides ample basis for my study: material interests are

¹ E.g. Stern, Nicholas (2006). *Stern Review on the Economics of Climate Change*. HM Treasury.

² E.g. Morgenthau, Hans and Kenneth Thompson (1985). *Politics Among Nations*. New York: McGraw-Hill.

³ E.g. Lantis, 2006; Shreurs and Tiberghien, 2007; Bättig and Bernauer, 2009.

perhaps a necessary, but not sufficient, condition of support for a climate treaty, and political and other factors also likely play a role. Similarly, a study by Bättig and Bernauer found that democracy had a positive effect on levels of political commitment to climate change mitigation, but did not examine specific political mechanisms (Bättig and Bernauer, 2009). There are no studies to my knowledge that compare the relative importance of specific material interests and political factors.

I will limit my discussion to Annex 1 countries under the Kyoto Protocol, as only they were called upon to make legally binding reductions commitments during the first reduction period (2008-2012). My methodology will be as follows: I will begin with a discussion of the material and political factors determinants I propose to examine. Then I will present three pairings of countries to compare the relative impact of political and material factors in each. Finally, I will conclude with a summary of results and implications.

Material Determinants

The conventional wisdom of international relations scholarship is that states are rational actors that seek to maximize their utility, or material gain.⁴ While many believe that states also have reason to cooperate with each other, and may make concessions in order to do so, few would deny that states usually, or always, consider their material interests to at least some degree in the international arena. Under international climate treaties, states negotiate individual reduction commitments, which subsequently require changes in domestic policy. The extent to which states cooperate in such treaties, therefore, is related to states' perception of the costs and benefits of the domestic action required.

A concern shared widely among actors is that national commitments to greenhouse gas (GHG) reductions will harm the economic competitiveness of the industrial sector. This is mainly due to the fact that most policies implemented by governments and geared toward reducing GHG emissions include as a key component reductions in high emitting sectors. Because of this, states with larger industrial sectors can be expected to experience greater opposition toward GHG reduction policies, both on the national and international levels. Indeed, the effect of such opposition has been demonstrated at the national level: a 2010 survey by the European Bank for Reconstruction and Development found that larger industrial sectors were correlated with lower implementation levels of domestic climate change policy (EBRD, 2010).

Similarly, states that are heavily dependent on fossil fuels as an energy source face greater costs in transitioning toward a low-carbon energy model. As these states will experience resistance in reducing emissions from the energy sector in the short run, they are less likely to make reduction commitments on the international level. It can also be

⁴ E.g. Morgenthau, Hans and Kenneth Thompson (1985). *Politics Among Nations*. New York: McGraw-Hill.

expected that states for which fossil fuel products comprise a large portion of exports will approach an international treaty with more caution, as such a treaty might adversely demand for their products. On the other hand, a global climate regime would benefit states that have a comparative advantage in alternative energy technologies, as they are better poised to reduce domestic energy emissions, and international demand for their products may increase.

Another way to gauge how states assess the material costs of cooperating in a climate change regime is to look at actual emissions trends as a generalization of states' emissions abatement costs. All other things equal, countries whose emissions have declined from the base year of the treaty to the present day (e.g. Russia) should be more cooperative in an international climate regime, because they expect to be able to meet targets more easily and with minimum disruption to their economies. In contrast, countries whose emissions are climbing due to economic development (e.g. India, China) might be less supportive of an international regime, as reducing emissions or limiting emissions growth could have a disruptive effect on their economies.

While the material determinants outlined above are comprised of the actual and perceived costs of mitigation action, another way to assess material costs is to look at the potential costs of *not* taking action—i.e., the damages states can expect to incur from climate change. Such damages are extensive; however, in the context of this study, the costs of inaction can be considered mostly negligible, as all states are industrialized or transitioning Annex 1 countries that have a comparatively high capacity for adaptation.

Summary of Material Determinants

- (1) Size of the carbon-intensive sector, defined by the percent contribution of this sector to national GDP, averaged from 1995 to 2012. Data was obtained from the World Bank.⁵
- (2) Relative dependence on exports of fossil fuel products, measured by the percent fuels (coal, oil, and gas) comprise of total exports, averaged from 1995 to 2012. Data was obtained from the World Bank.
- (3) Relative use of fossil fuels for domestic energy, measured by the percent of fossil fuels in the country's primary energy supply, averaged from 1995 to 2012. Data was obtained from the World Bank.
- (4) National investment in clean energy, as measured by percent growth of electricity production from renewable sources (excluding hydroelectric) between 1995 and 2012, and the five-year growth rate of investment between 2005 and 2010. The former data was obtained from the World Bank, and the latter from Bloomberg (Pew, 2010).

⁵ <http://data.worldbank.org/>

- (5) The opportunity cost of abatement, as measured by emissions trends between 1990 and 2010. This data was obtained from the UNFCCC's website, and is based on national reports.⁶

Political Determinants

Because states' responses to developments in the international arena occur under the sphere of domestic politics, such responses are subject to the context of homegrown electoral interests, national discourse, and domestic political institutions. The role of these interests, ideas, and institutions in determining states' level of cooperation in the international climate regime has been of interest to political science scholars.⁷ In my analysis I will focus on certain factors: the electoral structure of state legislatures, the distribution of authority, the effect of multi-level governance and leadership, the political orientation of the government, and the direction of public opinion.

Among different types of electoral systems, it has been argued that proportional representation allows for a greater representation of voters' environmental interests (Schreurs and Tiberghien, 2007). Proportional representation systems tend to result in inclusive governments with a greater number of parties than majoritarian electoral systems, which tend to result in dominance by two large parties. A greater number of parties in turn means that parties with explicit environmental agendas, such as the green parties active in Europe and elsewhere, are able to participate in governance. The effective number of parties and the relative representation of green parties, then, can be used as indicators to measure how the electoral system lends itself to cooperation in the climate regime.

If authority is highly concentrated within a government, it may be easier for policymakers who are personally committed to particular goals to act (or, conversely, for policymakers to easily avoid action). When authority is more dispersed, even highly motivated policymakers might not be able to pass climate change policies, as opponents can easily take advantage of multiple veto points. In this regard, it has been observed that parliamentary systems are more aggressive in implementing climate change policies (Dolsak 2001) and more successful in ratifying international treaties (Lantis, 2006) than presidential systems.

The concentration of authority is also a key concept in explaining the unique role played by the European Union in leading the climate change negotiations. While the EU's proactive stance appears puzzling at first considering the diversity of viewpoints and emission reduction capacities among member states, rotating leadership in the European Council has encouraged each member state to leave its "imprint" in the negotiations. This system of "collective entrepreneurship" has meant that the most

⁶ <http://unfccc.int/>

⁷ E.g. Victor, 2006; Schreurs and Tiberghien, 2007; Harrison and Sundstrom, 2007; Bättig and Bernauer, 2009.

proactive countries, as opposed to the least, have had their agendas promoted at the international level (Shreurs and Tiberghien, 2007).

Government orientation should also matter for several reasons. Left-wing governments are more likely to employ tax-based policies, which can be used to stimulate clean energy development and penalize carbon emissions. Left-wing voters also view government intervention and market-shaping policies more favorably than right-wing voters. Finally, it has been observed that green parties most often form coalitions with left-wing parties (Burchell, 2002). For these reasons, a left-leaning administration can be considered more likely to support an international climate regime than a right-leaning one.

Finally, voters' awareness of climate change as a policy issue will determine the extent to which policymakers feel compelled to deliver climate-related results, including cooperation in the international climate regime. The 2007–2008 Gallup Poll, which asked participants in 128 countries “how much they know” about climate change, can be used as a measure of how voters are aware of climate change in relation to other potentially conflicting policy issues.

Political Determinants Summary

- (1) The effective number of political parties, which describes the degree of party fragmentation in the legislature, averaged from 1995 to 2011. Values are obtained from Michael Gallagher's book *The Politics of Electoral Systems*.⁸
- (2) The percentage share of legislative seats held by the green party, averaged over the years that the green party has been a governing party, and obtained from the Election Results Archive of the Center on Democratic Performance.⁹
- (3) Whether the state is parliamentary or presidential.
- (4) Whether the state is a member of the European Union.
- (5) Government orientation, describing the orientation of the ruling party or coalition, averaged from 1995 to 2009. Values obtained from the “Database of Political Institutions” (Beck, et al., 2001).
- (6) Voters' awareness of climate change, as measured by the percentage of respondents that declared they know “something” or “a great deal” about climate change. Data obtained from the Gallup Poll.¹⁰

⁸ Gallagher, Michael and Paul Mitchell (eds) (2008), *The Politics of Electoral Systems*, Oxford and New York: Oxford University Press.

⁹ <http://cdp.binghamton.edu/>

¹⁰ <http://www.gallup.com>

Measuring Cooperation

States' levels of cooperation in the international climate regime can be measured in a number of ways, and several political economy scholars have come up with methods of quantifying them.¹¹ For my analysis I will borrow a measure created by Bättig et al, comprised of five indicators: (1) a UNFCCC indicator that measures if and how quickly a state ratified the UNFCCC, (2) a Kyoto Protocol indicator that measures if and how quickly a state ratified the Kyoto Protocol, (3) a reporting indicator that measures if a state has submitted national communications on time, (4) a finance indicator that measures how timely a state's payments to the UNFCCC have been, and (5) an emission indicator that measures a state's improvement in per capita emissions (Bättig et al, 2008). The scores for Canada, Russia, and Japan have been downgraded due to Canada's withdrawal from the treaty and the other states' statements of non-cooperation in a second commitment round. The results are indicated below in Fig. 1 (highest possible score is six).

Fig. 1 – States' Cooperation Levels (Bättig et al, 2008)

Australia	Canada	France	Germany	Japan	Russia	UK	US
2.54	2.02	4.24	4.85	2.34	2.99	4.92	2.53

¹¹ E.g., Bodnar, 2004.

Pair Comparisons

1 – Germany and Australia

Material Determinants

	Percent of GDP from industry, 1995-2012 average	Fossil fuel energy consumption (% of total), 1995-2012 average	Fuel exports (% of merchandise exports), 1995-2012 average	Percent growth of renewable electricity production, 1995-2012	Five-year growth rate of renewable investment, 2005-2010	Percent change in total GHG emissions, 1990-2010
Australia	25.45	94.09	23.38	457.90	62.5	13.62
Germany	29.92	82.79	1.71	1616.32	75.3	-21.72

Political Determinants

	Effective Number of Parties, 1995-2012 average	Percent of seats held by green parties, 1995-2012 average	Parliamentary/ Presidential	EU?	Government orientation, 1995-2009 average (1 – right, 3 – left)	Percentage knowing “something” or “a great deal” about CC
Australia	3.35	5.04	Parliamentary	No	1.53	97
Germany	4.48	8.8	Parliamentary	Yes	1.93	96

Cooperation Levels

Australia	Germany
2.54	4.85

While Germany played a leading role in establishing the EU agenda for the international climate negotiations and convincing other countries to accept ambitious emissions cuts,¹² Australia has been a cautious participant, initially refusing ratification and not joining the Protocol until 2007. Both countries are currently on track to meet their requirements; however, Germany has agreed to an eight percent *cut* in emissions, with a voluntary target of 21%, whereas Australia negotiated an eight percent *increase* in emissions, both from 1990 levels. Looking to the future, Germany continues to demonstrate leadership: it argued at Durban for an ambitious treaty for the post-2012 period while agreeing to participate in a second round of commitments. In contrast, Australia joined a group of countries calling for a legal framework rather than a treaty, not to be established before 2015, with no mechanism for guaranteeing ambitious cuts from industrialized nations.¹³

¹² E.g. Goodenough, Patrick, “German Leader to Press Bush on Kyoto Protocol,” *CNS News*. July 7, 2008.

¹³ *Earth Negotiations Bulletin*, Volume 12 Number 534, December 13, 2011.

What best explains this difference? Political institutions in both countries can be considered conducive to cooperation. Both governments have parliamentary legislatures, in which political parties must form coalitions and authority is highly concentrated. Green parties have served as governing parties in both governments' legislatures. The green party in Germany, however, can be considered to have had more influence as it has occupied more seats for a longer period of time. In Australia, the green party has not been able to initiate legislation, as Australia's electoral system prevents minor parties from entering the House of Representatives, which serves as the introductory chamber for most bills. However, the direct influence of the green party in determining Germany's climate change stance is questionable. The green party was, in fact, initially hesitant about supporting climate change policy, as it was loudly championed by the nuclear lobby (Hatch, 2007).

There are few other differences between Germany and Australia in terms of non-institutional political variables. Public awareness of climate change is high in both countries. Both countries experienced left- and right-leaning governments between 1995 and the present. The most recent shift, however, was in the opposite direction, with Germany moving from left to right in 2005, and Australia moving from right to left in 2007. The shift could be said to have more meaning for Australia than for Germany. While Angela Merkel's conservative government continued to take a supportive stance toward environmental policy and the Kyoto Protocol, it was Kevin Rudd's left-leaning government that decided to ratify the Kyoto Protocol in 2007.

Compared to political factors, material interests provide a clearer explanation of the two countries' levels of cooperation. Germany is clearly less dependent on fossil fuels than Australia, both as an energy source and as an export commodity. Australia has a highly developed coal extraction industry. Black coal is the country's single largest export, comprising 16 percent of all commodity trading in 2011, and the government has announced that domestic coal supplies will last for nearly 100 years.¹⁴ Because of this, the country would face significant economic disruption if forced to implement large GHG reductions.

On the other hand, the growth in renewables tells an opposite story for Germany. With 1616% growth between 1990 and 2010, Germany had 36.2 GW of renewable energy capacity in 2009, compared to only 3.3 GW in Australia.¹⁵ Germany's head start in clean tech can help to explain why it would be more willing to accept ambitious cuts in the future; it relies less on fossil fuels for its own electricity, and domestic suppliers of renewable energy technology would stand to profit for increased demand for their products.

¹⁴ Department of Resources, Energy, and Tourism, Australian Government (<http://www.ret.gov.au>), 2012.

¹⁵ International Energy Agency (iea.org), 2012.

In addition to fossil fuel dependency, emissions trends can explain the countries' behaviors. While Germany's emissions have been continually decreasing since 1997 due to the collapse of industry in the East, Australia's have risen over 13% between 1990 and 2010. Looking at the years between 1990 and 2000 is also telling: while Germany's emissions decreased 16.9%, Australia's increased 8.44%.¹⁶ The opposite trends in emissions during the years that Kyoto Protocol was negotiated means that Germany was, and continues to be, more confident of its ability to meet challenging reduction goals, whereas Australia would, for the reasons detailed above, need to make fundamental changes to its industry in order to do so.

In conclusion, compared to political factors, a combination of material factors provides a clearer explanation as to why Germany has been consistently more supportive of the international global climate regime than Australia. While support from the green party and the phenomenon of "collective entrepreneurship" in the EU likely played a role in determining Germany's strong support, the goals eventually reached were unambitious enough given Germany's established declining trend in emissions, and provided enough flexibility and exceptions for German businesses (Hatch, 2007), that the industrial lobby was willing to accept them. On the other hand, while Australia's left-leaning party hurried to ratify the Protocol in 2007, the fundamental economic problems that the country would face if it were to adopt ambitious emissions cuts continue to prevent it from doing so.

¹⁶ UNFCCC (<http://unfccc.int/>), 2012.

2 – Japan and the UK

Material Determinants

	Percent of GDP from industry, 1995-2012 average	Fossil fuel energy consumption (% of total), 1995-2012 average	Fuel exports (% of merchandise exports), 1995-2012 average	Percent growth of renewable electricity production, 1995-2012	Five-year growth rate of renewable investment, 2005-2010	Percent change in total GHG emissions, 1990-2010
Japan	29.65	81.45	0.83	67.43	51.1	-0.99
UK	25.57	88.03	8.55	841.92	127.4	-23.47

Political Determinants

	Effective Number of Parties, 1995-2012 average	Percent of seats held by green parties, 1995-2012 average	Parliamentary/ Presidential	EU?	Government orientation, 1995-2009 average (1 – right, 3 – left)	Percentage knowing “something” or “a great deal” about CC
Japan	3.68	0	Parliamentary	No	1.27	99
UK	3.45	0	Parliamentary	Yes	2.6	97

Cooperation Levels

Japan	UK
2.34	4.92

The UK and Japan were the 71st and 73rd countries to ratify the Kyoto Protocol, respectively. While both committed to sizeable reductions in the first commitment period (eight and six percent reductions, respectively, compared to 1990 levels), only the UK will meet its reduction goals. Japan has struggled since ratification to maintain a negative emissions balance in relation to 1990 levels, and, after the disastrous earthquake of 2011 and the subsequent loss of nuclear power, will see a sharp increase in emissions from fossil fuels use.

The UK has been one of the most ardent supporters of ambitious reduction commitments from developed nations. In formulating the EU’s position for the Copenhagen talks in 2009, the UK was in favor of “almost unilateral” increases in the EU’s target, without any commitments by third party countries.¹⁷ At the Durban talks in 2011, the UK indicated it would participate in a second round of commitments for the Kyoto Protocol, while also calling for a legally binding commitment for all countries (“Durban,” 2012). This stance contrasted sharply to Japan’s, which has formally announced that it will not participate in any future commitment periods for the Kyoto

¹⁷ “EU countries get cold feet on raising climate goals,” *Yahoo News*. October 14, 2009.

Protocol, as it believes that “setting the 2nd commitment period will lead to solidifying the unfair and ineffective framework beyond 2012.”¹⁸

Looking at the political variables, the two salient differences are the UK’s membership in the EU and the political orientation of the parties. In all other regards, the UK and Japan have very similar political structures: both legislatures are parliamentary and neither has active political participation by green parties. Awareness of climate change is high in both countries.

While the UK government had a more leftward political orientation between 1990-2009, climate change action enjoys a wider base of support in the UK, even among right-leaning political groups. For example, the Conservative Party was in full support of The Climate Change Act 2008, which commits the country to an 80% reduction of remissions by 2050 compared to 1990 levels, and aims to enable a “low-carbon economy.” The right-leaning newspaper *The Telegraph* has run several editorials supporting the UK and the EU’s climate change agenda and criticizing the US’ withdrawal from the Kyoto Protocol.¹⁹ Because of this, it is implausible to state that leftward political orientation in the UK itself was a deciding factor for its cooperation in the global climate change regime.

Other arguments have been made that the UK had special political motives to support the Kyoto Protocol; in particular that Prime Minister Tony Blair sought to prove his independence from the US, especially after his administration had been criticized for its central role in the invasion of Iraq. However, it can be argued that this particular political consideration also applies to the Japanese government, as Japan was also a member of the “coalition of the willing.” Furthermore, the fact that a Japanese city name was given to the treaty should have exerted special political and emotional pressure on the Japanese government to lend its support.

Looking at material determinants provides a clearer explanation for the two countries’ differences in support. There is wide difference in emissions trends, as well as an almost tenfold difference in the growth of renewable energy production between 1995 and 2010. Since 1990, the UK government has initiated large-scale privatization of energy-consuming industries and liberalized its electricity and gas systems, which improved energy efficiency and also resulted in a change from coal to gas (the “dash for gas”), dramatically lowering emissions. It is estimated that these policy changes, enacted in the early 90s, contributed about half of the total reductions in GHG emissions since 1990.²⁰ Japan, on the other hand, had already made the shift to gas and reduced its coal consumption to 18 percent of total electricity by 1988, based on diversification efforts

¹⁸ Ministry of Foreign Affairs (mofa.go.jp), 2012.

¹⁹ E.g. Lean, Geoffrey. “Conservatives have always been green.” *The Daily Telegraph*, June 19, 2009; Rudd, Roland, “EU must lead the world on climate change,” *The Daily Telegraph*, July 11, 2009.

²⁰ Clark, Pilita. “CO2 emissions at lowest levels in 40 years.” *Financial Times*. March 29, 2012.

following the two oil crises in the 1970s. In other words, Japan had already taken advantage of the “dash for gas” reductions by 1990, the base year for calculations.

Similarly, Japan’s economy was already more energy-efficient than the UK’s by 1990. In 1990 Japan consumed 134 kg of oil equivalent per \$1000 (constant 2005 PPP) of GDP, compared to 160 kg of oil equivalent by the UK. In 2010, the figures were 125 kgoe for Japan and 101 kgoe for the UK. While Japan still has room to improve its energy efficiency, the fact that UK had more wiggle room at the base year meant that it could cut emissions at a lower cost than Japan. Like Germany, the UK was more confident of its ability to meet challenging reduction goals, whereas Japan would need to make fundamental changes to its economy in order to do so.

Furthermore, the UK has been significantly more proactive than Japan in its investments in renewable energies since 1990, indicating that it anticipates growth in, and intends to support, these sectors in the future. Considering the national law passed in 2008 that promises a decrease of 80% emissions from 1990 by 2050, the UK seems serious about transitioning its economy to a low-carbon model. The UK, like Germany, has taken greater action to reframe material interests as compatible with future reductions in emissions. In summary, looking at historical trends and current initiatives, it is apparent that material interests more easily explain the UK’s ongoing support, and Japan’s wariness, of the international climate regime.

3 – Canada and Russia

Material Determinants

	Percent of GDP from industry, 1995-2012 average	Fossil fuel energy consumption (% of total), 1995-2012 average	Fuel exports (% of merchandise exports), 1995-2012 average	Percent growth of renewable electricity production, 1995-2012	Five-year growth rate of renewable investment, 2005-2010	Percent change in total GHG emissions, 1990-2010
Canada	31.46	75.65	16.73	111.63	70.2	46.35
Russia	36.37	91.16	53.5	636.78	0	-54.82

Political Determinants

	Effective Number of Parties, 1995-2012 average	Percent of seats held by green parties, 1995-2012 average	Parliamentary/ Presidential	EU?	Government orientation, 1995-2009 average (1 – right, 3 – left)	Percentage knowing “something” or “a great deal” about CC
Canada	3.78	0.32	Parliamentary	No	2.6	95
Russia	7.72	0	Semi- Presidential	No	1	85

States’ Cooperation Levels

Canada	Russia
2.02	2.99

Canada and Russia are the 99th and 127th parties to ratify the Kyoto Protocol, and Canada is the first and only party to withdraw from the Protocol after ratifying it, in 2011. Originally, Canada had committed to a GHG reduction of 6% from 1990 levels by 2012, but its emissions soared to 46% more than 1990 levels by 2010, making it clear that it would not meet its targets. On the other hand, Russia committed only to not increase its emissions beyond 1990 levels, and has easily overshoot that target by cutting 55 percent off 1990 levels by 2010. Neither country supports the Protocol going forward: both give the reason that the Protocol is flawed because it does not include the world’s largest emitters.

With a more liberal, parliamentary government with green party representation and a higher awareness of climate change, the political factors indicate the Canada should have a higher level of cooperation in the climate regime than Russia. Yet Russia remains a party of the Kyoto Protocol. In this pairing, it is clear that material factors are dominant in determining the outcome. While Russia is even more fossil fuel dependent than Canada, its emissions trajectory, a result of collapse of industry following the fall of the Soviet Union, means that it has absolutely nothing to lose from its zero reduction pledge, and that it would have to take no action at the domestic level. On the other hand, Canada

does depend on fossil fuels for a large percentage of its energy consumption as well as its exports, and would be faced with large and expensive adjustments in its economy if it were to attempt to decrease its emissions. The fact that Russia is growing quickly and its emissions will likely begin to bounce back may also explain its current wariness toward making further commitments.

While material factors are more important than political factors in determining the difference in levels of cooperation in this pairing, it is also true that the political circumstances in Canada played a role in its initial ratification of the Kyoto Protocol, and the timing of its eventual withdrawal. The change of political power from the Liberal Party to Stephen Harper's Conservative Party spelled the fate of the Kyoto Protocol in Canada, as Harper was an outspoken critic. Additionally, the federal system in Canada, where provinces retain a high level of sovereignty, made it exceedingly difficult to implement climate change policies at the national level, as some states opposed them.

Conclusion and Implications

In the three pairings examined in this paper, material interests played a discernably greater role than political factors in determining states' levels of cooperation in the international climate change regime. In particular, it was primarily states' established emissions trajectories that determined whether they were willing to make and follow through with legally binding commitments. The effect of political institutions and circumstances was also apparent, but could not provide as plausible an explanation for states' levels of cooperation. The importance of established emissions trajectories in determining states' final cooperation implies that more care should be taken in designing a treaty that takes into account states' varying opportunity costs for abatement.

While this conclusion could be taken cynically to mean that states will only act in accordance with their material interests, an additional observation is that states with higher levels of growth and investment in renewable energy were also more cooperative in the international climate regime. This means that states that view climate change action as a chance to achieve material gains will be more likely to support climate treaties in the future. States' perception of their material interests in relation to an international climate regime may be changing as the economic viability of sustainable development, corporate social responsibility, energy efficiency, and "green jobs" becomes more apparent, along with further knowledge and empirical observation of the negative effects of climate change.

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Appendix

Mapping of Variables

Material Determinants

	Percent of GDP from industry, 1995-2012 average	Fossil fuel energy consumption (% of total), 1995-2012 average	Fuel exports (% of merchandise exports), 1995-2012 average	Percent growth of renewable electricity production, 1995-2012	Five-year growth rate of renewable investment, 2005-2010	Percent change in total GHG emissions, 1990-2010
Australia	25.45	94.09	23.38	457.90	62.5	13.62
Canada	31.46	75.65	16.73	111.63	70.2	46.35
France	21.97	52.51	3.11	445.86	97.9	-8.61
Germany	29.92	82.79	1.71	1616.32	75.3	-21.72
Japan	29.65	81.45	0.83	67.43	51.1	-0.99
Russia	36.37	91.16	53.5	636.78	0	-54.82
UK	25.57	88.03	8.55	841.92	127.4	-23.47
US	22.75	85.68	3.09	104.54	102.7	8.57

Political Determinants

	Effective Number of Parties, 1995-2012 average	Percent of seats held by green parties, 1995-2012 average	Parliamentary/ Presidential	Feder- alist?	EU?	Government orientation, 1995-2009 average (1 – right, 3 - left)	Percentage knowing “something” or “a great deal” about CC
Australia	3.35	5.04	Parliamentary	Yes	No	1.53	97
Canada	3.78	0.32	Parliamentary	Yes	No	2.6	95
France	5.46	1.55	Semi- Presidential	No	Yes	1.67	93
Germany	4.48	8.8	Parliamentary	Yes	Yes	1.93	96
Japan	3.68	0	Parliamentary	No	No	1.27	99
Russia	7.72	0	Semi- Presidential	Yes	No	1	85
UK	3.45	0	Parliamentary	No	Yes	2.6	97
US	2.16	0	Presidential	Yes	No	1.93	97