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The Political Economy of Climate Aid: Domestic Energy Interests and Domestic Institutions

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by

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Abstract

The Political Economy of Climate Aid: Domestic Energy Interests and Domestic Institutions

Kristina A. Rohrer

In the face of the global climate crisis, wealthy states have pledged international aid to support mitigation and adaptation in developing countries. Existing studies of climate aid have three limitations. Results regarding donor preferences are inconsistent. Climate aid is viewed as the same as other types of foreign aid, and donors are treated as unitary actors, ignoring domestic interests and domestic institutions. As a result, existing research does not provide a comprehensive explanation for variation in state contributions to climate aid. This project seeks to unpack the black box of donor state preferences, examining the relative influence of the fossil fuel and renewable energy industries on donor states' climate aid contributions as a proportion of total overseas development assistance. The research tests three sets of hypotheses: (1) The fossil fuel industry is likely to be influential when it is a major provider of the energy consumed in the state; (2) The renewable energy industry is likely to be influential when it has potential to be a major energy provider in the future; (3) The domestic institutional context in which these industries operate shapes the relative influence of both industries. The dissertation employs a cross-sectional time series analysis from 2002-2015 to investigate these relationships in 28 OECD donor states. The findings are that more renewable electricity production and more fossil fuel consumption within a state is correlated with higher amounts of climate aid provided by that state. In addition, when the renewable energy industry is growing at a faster rate than the fossil fuel industry, this is correlated with more climate aid provided by that state, specifically when that state has strong democratic institutions. The

results expand our understanding of what shapes donors' climate preferences and what additional barriers exist to climate aid.

1. Introduction

In a world of limited resources, what are the politics behind how money is allocated to combat climate change in the international system? What determines how much donors contribute to combating the most important issue of today? Or perhaps more accurately phrased, what stops them from contributing more? In the past few years, we have seen a global pandemic, increasing conflict causing unprecedented humanitarian crises, a war in Europe and of course a global climate crisis. With so many problems to address at home and abroad, what drives where states put their financial resources? This dissertation focuses on explaining what accounts for variation in how much donors contribute to climate aid, defined as foreign aid in support of environment sustainability and aid to biodiversity, climate change mitigation, climate change adaptation and desertification (OECD 2022).

Climate change is a problem given increasing priority on the agendas of states today. In many advanced industrialized countries, the majority of people view climate change as a major threat to their societies and this view has been rising sharply in recent years (Fagan and Huang 2019). The International Panel on Climate Change (IPCC) 2018 report found that average global temperatures have increased 1°C from pre-industrial levels. Furthermore, at the current rate of a 0.2°C average temperature increases per decade, if nations remain on their current trajectories, the globe could reach an average global temperature rise of 3ºC from preindustrial levels by 2100 (IPCC 2018). A temperature increase of this magnitude would have disastrous effects on global socio-ecological systems.

The IPCC recommends limiting the rise in global average temperature to 1.5ºC, which will require “rapid, far-reaching and unprecedented changes in all aspects of society” (IPCC

2018, pg. 15). Achieving this goal will be expensive. The United Nations Development Programme (UNDP) estimates that the necessary behavioral shift in the energy sector alone, to keep warming limited to 1.5ºC, will require an annual average investment of US $2.4 trillion from 2016 to 2035 (UNDP 2019). However, it is not only mitigation that is costly. Proceeding with business as usual will result in increasingly severe climate impacts and rising adaptation costs. We are already experiencing the economic costs of climate change through increasingly severe weather events. Weather disasters have always been costly to deal with, but the increasing severity and frequency of weather events fueled by climate change exacerbates the expense of dealing with the aftereffects, as well as the corresponding global economic losses that result from the loss of life and damage to infrastructure (Ritchie & Roser 2019). In 2017, for example, Hurricane Maria devastated the US territory Puerto Rico and resulted in US $5.4 billion of federal assistance from FEMA to help with recovery efforts (FEMA 2019) despite the costs of damage amounting to an estimated US $100 billion (Coto 2018). But the scope of climate change related expenses is much greater than that just more severe weather. The world will also experience rising sea levels that endanger coastal residents, food shortages due to drought and desertification and many more (Brown 2009).

Combating climate change by reducing carbon emissions and dealing with the impacts from climate changes that we already face is an expensive problem, with which all states have to contend. Developing countries in particular are going to require financial assistance to combat climate change and implement measures to adapt to its effects. The question of financing is particularly crucial for developing countries as they lack the capacity to deal on their own with the problems they will soon face. Moreover, the aforementioned impacts of

climate change will be the most acute for many of these countries despite their having contributed the least to causing the climate problem (Bowen et al. 2017).

One solution to this problem is international climate aid. Discussions regarding environmental aid have been a major focus of international summits since 1972. Marcoux et al. (2013) write…

> "Global negotiations over the environment in Stockholm in 1972 and continuing now 40 years on at Rio+20, a consistent demand of developing countries has been that any requirement to pursue economic development in a way that is less damaging to the global environment will need to be paid for, in part, by developed countries. Both sides recognize the costs of adjustment will be substantial and that any international co-operation will be premised upon a substantial resource transfer from north to south" (pg. 1).

However, these discussions have always been contentious. Developing countries believe it is not their responsibility to pay for the impacts of environmental harm because they are historically not responsible for the bulk of emissions. Developing countries also do not want to sacrifice potential advances in economic development for the sake of global environmental protection (Pauw 2017; Roberts & Parks 2009; Clemencon 2006; Falkner 1998). On the other hand, developed countries do not want to shoulder the financial burden alone. This division of interests was seen as a core contention between developed and developing nations during negotiations for the Montreal Protocol in 1987, the Kyoto Protocol in 1997 and the Paris Climate Accords in 2015. For the Montreal Protocol, the multilateral financial assistance mechanism finally agreed upon has been seen as critical to the success of the agreement (Falkner; 1998). Providing funding to support transitioning to greener practices has worked in the past and many would suggest it is critical to the future of combating climate change.

Specific discussion of climate aid date back to the 1991, the year which marked the first round of negotiations for the UN Framework Convention in Climate Change. Developing

countries have asked rich developed countries to finance their mitigation and adaption efforts. To date, rich countries have made promises to provide financing and funds have been established as part of the international climate regime to funnel climate aid from rich to poor countries. The largest of these funds that focus on funding primarily mitigation projects are Green Climate Fund (GCF), the Global Environment Facility (GEF), and the Climate Investment Fund (CIF) while the largest fund focusing on adaptation finance is the Adaptation Fund (AF).

At the 2009 Copenhagen Summit, countries agreed climate finance needed to increase, setting a goal of reaching US$ 100 billion a year by 2020. However, they failed to outline a plan designating individual-state contributions (Klock et al., 2018). The US $100 billion per year goal was reaffirmed at the 2015 Paris Climate Accords (Klock et al. 2018). Most recently, in 2022, at the 27th Conference of the Parties in Sharm el-Sheik Egypt, over 190 countries agreed to create a loss-and-damages fund to help poorer countries recover from climate change induced disasters. The details of this fund have not yet been decided, including who should contribute to the fund, how much should they contribute, or who should get paid from that fund.

While these international funds are a positive step, state pledges of climate support are non-binding, and most research shows that states have not followed through on allocating the resources they promised to commit towards dealing with the issue of climate change (Clemencon 2006; Cui & Huang 2018; Klock et al. 2018; Hicks et al. 2008). While tracking progress to climate financing goals is difficult, most estimates find the world falling far short of this goal (Buchner et al. 2021). This shortfall of funding is what motivates much of the climate aid literature. Rich countries do not want to be on the hook indefinitely for financing

the solution for the entire world. This is in part because the exact costs of climate change are not known and in part because rich countries do not want to be held accountable if they do not meet their promises (Uddin 2017). Therefore, to date, the primary mechanism for international climate aid has been through voluntary bilateral assistance from rich countries and levels of climate aid have been increasing over time. In 2010, climate aid accounted for 15% of all bilateral official development assistance (Victor, 2018). This increase is promising but still falls short of global goals.

Scholarship on bilateral climate aid identifies two key mechanisms that work to limit international climate aid. First, climate aid, like reducing carbon emissions, is a public good. Helping developing countries mitigate and adapt to climate change provides a benefit for all states. Transitioning energy sectors to renewable supplies will reduce developing country emissions while adaptation assistance allows these countries to continue to contribute to the global economy and will prevent refugee crises and other humanitarian crises in the future. However, providing public goods like climate aid is challenging for states because in doing so, donors incur concentrated costs but only diffuse benefits. The nature of the problem is that the impact of concentrated costs and diffuse benefits incentivizes states to free ride in the provision of any public good, and it is likely that this is the case with climate aid as well. The solution to this problem is collective action between all states in the international system, yet to date we have not seen the necessary collective action occur.

The second mechanism affecting levels of climate aid focuses on domestic political interests and institutions. A collective action analysis of the climate aid challenge black boxes the intra-state dynamics that may influence state climate aid choices. However, state choices regarding climate aid will also reflect internal politics dynamics. This leads to the core research

question of this dissertation: What explains the variation in the proportion of donor aid dedicated to climate change? Building on the existing literature, I argue that domestic political interests and institutions affect national prioritization processes in aid allocation. Specifically, I argue that the energy sector has vested interests in how much donors allocate to climate aid, and because of this, energy industries can be expected to try to influence state allocation decisions. The industries within the energy sector most affected by the distributional impacts of climate aid will be the fossil fuel industry and the renewable energy industry. I argue that each industry's ability to influence a donor state's climate aid allocations is likely to depend on their relative ability to influence national policy. This, in turn, depends on their potential to be a major energy provider in the future and the domestic institutional context in which they operate.

This dissertation proceeds in five main chapters. Following this introduction, the second chapter provides an overview of the broader literature on foreign aid and then focuses in on a review of the literature on climate aid. The literature review covers two questions in both the foreign aid and climate aid literatures: Who gives aid and why and who receives aid and why? Chapter two then discusses why foreign aid and climate aid are important and then draws lessons from the foreign aid literature to inform how climate aid can be more effective. Chapter two concludes with a discussion of the core gaps in the foreign aid and climate aid literatures. These gaps provide the basis for how my dissertation contributes to the existing scholarship. The third chapter presents my theory for understanding what causes variation in the proportion of donor state aid dedicated to climate change over time, along with my hypotheses and the reasoning behind each. I argue that domestic interests such as the energy industry have a vested interest in climate aid and will attempt to influence climate aid decisions.

Furthermore, I argue that domestic institutions in each state will mediate the degree to which certain industries can exert influence. I describe why the fossil fuel industry is likely to be opposed to climate aid, why the renewable energy industry is likely to be in support of climate aid, and why their ability to influence state preferences is shaped by the interaction between the domestic institutional context and domestic interests. The fourth chapter presents the data used in this dissertation including the research sample, descriptive statistics, and time trends for all dependent and independent variables. The fifth chapter presents the results for each of the three hypotheses tested and a discussion for each. Regarding the influence of each energy industry, I find that as fossil fuel consumption in a country increases its climate aid also increases and the same relationship exists for renewable electricity production. I also find that donors with more democratic domestic institutions also result in more climate aid when the renewable energy industry has more potential when compared to the fossil fuel industry. The final chapter concludes with the theoretical and policy implications of the findings, limitations of this research and future research that can respond to these limitations.

2. Literature Review: Drivers of Foreign Aid and Climate Aid

Foreign aid is often perceived by the public as an altruistic service to the global community. Simply its name, foreign aid, makes aid seem like a good neighbor extending a helping hand to other nations in need. Despite appearances, research on foreign aid and climate aid both find that for the most part, altruistic motives do not drive the allocation of aid but rather serve the strategic objectives of donors. Those who receive aid are not chosen because they are the most in need of assistance. In addition, possibly because aid is not given solely to help nor to those most in need, the literature is mixed on when foreign aid is or can be the effective in achieving its goals. There are complicated political and economic interests behind the allocation of foreign aid and climate aid, and these interests can be an impediment to aid effectiveness. Two key research questions animate the foreign aid and climate aid literatures: By whom and why is aid given? By whom and why is aid received? In both the foreign aid and climate aid literatures, scholars find that donor interests are the main driver of aid.

2.1 Foreign Aid

Foreign aid has become a major policy tool that states and international organizations have used since the end of WWII following the success of the Marshall Plan. Foreign aid was intended to be used to increase economic growth, improve social policies and humanitarian assistance in recipient countries (Burnside & Dollar 2000). In 1970, the United Nations (UN) General Assembly called for an increase in foreign aid to developing countries and this goal to increase aid was reaffirmed in the 2005 Millennium Development Goals (Qian 2015). Despite states not meeting the UN expected foreign aid threshold of 0.7% of GNP by 2015, foreign aid flowing from developed countries has been increasing over time. The top foreign aid donors

have historically been member states of the Organization for Economic Co-operation and Development (OECD), though countries like Saudi Arabia and China have joined the foreign aid fray in recent years (Qian 2015). The following sections will look at what scholars have found to determine: who gives foreign aid, who receives this aid and when is foreign aid effective.

2.1a Who Gives Foreign Aid and Why?

Why donors give aid is a complicated function. Aid is given in pursuit of many goals. Donor countries commonly focus on economic growth and development, but they may also give aid to reduce conflict and increase stability in recipient countries. For the most part, the rationale for giving aid is not to help those in need but instead to further the interests of donors. Aid given for humanitarian purposes, such as disaster relief, healthcare, provision of food and shelter makes up a small fraction of all aid distributed (Qian 2015). Berthanlemy (2006) employs the term "altruism aid" to describe aid that is truly aimed to help recipient countries with their problems. Despite expanding the scope of altruism aid to include assistance for economic growth and building infrastructure, Berthanlemy (2006) still finds that few donors can be seen prioritizing altruistic aid and instead, state self-interest largely drives aid allocation (Wright & Winters 2010; Alesina & Dollar 2000; Bueno de Mesquita & Smith 2009; Kuziemko & Werker 2006; Morrison 2012). In the 1960s and 1970s, Cold War politics drove foreign aid, although it was labeled as aid to reduce poverty. In the 1980s, amidst the expanding global economy, aid shifted towards reducing debt liabilities and encouraging democracy (Graham & O'Hanlon 1997).

It is important to consider what has driven the shift in donor motivations for aid over time. Globalization has expanded and empowered different actors in society that have an

increasing international reach. Domestic economic actors played a large role in shifting U.S. trade policy after WWII, and they are critical to understanding the process of globalization (Chorev 2007). The shift toward aid dedicated to economic growth, development, and stability makes sense when you consider the types of actors that would benefit from such goals. Foreign aid has the potential to open up new markets and investment opportunities to transnational corporations. The majority of foreign direct investment (FDI) currently flows between developed countries but has been increasing slowly in the developing world over time (UNCTAD, 2017). Furthermore, expanding supply chains have been proliferating around the world. While there have been some limitations on this expansion (e.g., the protectionist actions of the Trump administration in the U.S. and the impacts of the COVID pandemic around the world), strong infrastructure, economic growth, and political stability in the developing world continue to serve international business interests. These actors have not limited their influence only to trade policy and, as the world increases in interconnectedness, foreign aid could be a valuable avenue for economic actors to exert their considerable influence (Tingly 2010).

The motives of donors depend on the state in question. Schraeder et al. (1998) find variation in donor motives for giving aid to African countries. Economic and political interests drive aid from the US, commercial incentives motivate Japan, while Sweden focuses its aid on one specific region because of its middle power status (Schraeder et al. 1998).[1] More broadly, large-N quantitative studies find mixed results regarding foreign aid and measures of donor country wealth. Bilateral foreign aid given between 1970-1994 has a positive relationship with increasing per capita income in donor countries but this has been decreasing over time (Alesina

[1] A middle power is defined as a country that is neither a great power nor a superpower, but still has some degree of influence on the international stage (Pratt 1990).

& Dollar 2000). More recent studies a find negative relationship between donor's GDP and foreign aid (Bueno de Mesquita & Smith 2009) but also a positive relationship with donor's GDP growth and foreign aid (Tingley 2010). When looking at top donors by decade Quian (2015) finds that the US is the top donor in all decades from 1960's through the 2010's except for the 1990's where Japan comes in first, while the US is second. This suggest that when looking at absolutely amounts of foreign aid, countries with a higher GDP tend to give more aid.

The foreign aid literature has also explored the role of domestic politics in shaping aid preferences. For example, donors with more conservative governments tend to give less aid to low-income countries and multilateral institutions while maintaining aid levels to middle-income countries (Tingley 2010). This may be because conservative governments are beholden to different special interests than progressive governments. Milner and Tingley (2010) show that foreign aid in the US is subject to lobbying from interest groups, congressional influence, and public opinion. For example, during good growing seasons, the US gives food aid as a means to subsidize domestic wheat farmers (Nunn & Qian 2014). The selectorate theory of war has also been applied to aid allocation, suggesting that leaders who can gain policy concessions from giving aid will do so, but only when they depend on a large winning coalition to remain in office (Bueno de Mesquita & Smith 2007).

All these studies illustrate that in foreign aid decision making, it is best not to treat donors as unitary actors. Scholars should instead leave open the possibility that sub-state actors could be influencing donor decisions. Moreover, domestic institutions are likely to play a role in mediating the effects of interest group lobbying. Different domestic institutional contexts can elevate some voices in society while excluding others. For example, Faust (2008) finds

that leaders in donor states with higher levels of voice and accountability, a measure of governance by the Worldwide Governance Index, are more likely to represent the interests of society as a whole and not just special interests in allocating official development assistance.

In summary, the drivers of foreign aid allocation are changing and complex. Economic interests in particular can gain from foreign aid, because aid can open up new opportunities for international economic actors. When considering what drives donor decisions in the allocation of aid, we need to unpack the internal dynamics of states to understand state behavior.

2.1b Who Receives Foreign Aid and Why?

The motivations of donors are also reflected in the characteristics of recipient countries. Donors give more aid to states that are strategically valuable. The value of a recipient depends on political and/or economic advantage that the donor can gain from giving them aid. Foreign aid is typically directed towards recipients that can provide political or economic gains for donors and not toward those in most need of assistance nor towards those with democratic institutions.

Recipients that are most likely to receive aid tend to have political or economic connections with donors or international organizations. For example, countries that have a history of voting with the US in the UN General Assembly receive more IMF loans than those that do not (Dreher & Jensen 2007). Similarly, states that hold a seat on the UN Security Council and/or a directorship on the World Bank executive board received more World Bank loans than states that do not hold those positions (Dreher et al. 2013). Even more explicitly, when recipients hold one of the rotating seats on the UN Security Council, they receive a 59% increase in aid from the US and an 8% increase in aid from the UN (Kuziemko & Werker 2006). For international organizations, it makes sense that having a seat on the UN Security

Council or World Bank Executive Board would give that recipient more influence and access to advocate for aid. Yet, there is also evidence that countries receive aid from donors that they are in alliances with and/or from donors with which they have historical colonial ties (Alesiana & Dollar 2000).

Qian (2015) sums up the literature on recipient need, stating, "the evidence for the determinants of aid consistently shows that factors unrelated to the need of recipient countries are important determinants of aid. This holds across contexts, different ways of measuring aid and a variety of empirical strategies" (p. 300). In fact, the poorest countries in the world receive only a small percentage of foreign aid (Qian, 2015). Even in the case of natural disasters, scholars find that recipients are only prioritized to receive humanitarian aid when there are high levels of media coverage of the disaster (Eisensee & Stromberg 2007; Stromberg 2007). These studies suggest that domestic political pressures in donor states rather than the needs of recipient states drive even the most altruistic types of aid that help with recovery efforts.

The third set of recipient characteristics that have been hypothesized to drive aid allocation relate to good governance. Good governance is defined as the absence of "corruption and anti-democratic behavior" (Winters & Wright, 2010, p 63).[2] Some scholars find that recipient states are rewarded for good governance, by being offered greater access to foreign aid (Wright & Winters, 2010). For example, a US foreign aid agency, the Millennium Challenge Corporation (MCC), awards aid to countries they deem well governed and a study of the MCC's aid flows finds that recipients of this aid also implement polices to improve their governance (Johnson & Zajonc 2006). However, other studies find no evidence that foreign

[2] Good governance indicators include, levels of democracy, environmental transparency and the Worldwide Governance Indicators (control of corruption, voice and accountability, rule of law, political stability and lack of violence, government effectiveness, regulatory quality).

aid is targeted consistently toward less corrupt countries (Alesina & Dollar 2000). Furthermore, democratic characteristics are rewarded in some cases but not consistently. Countries that democratize receive more aid but only when all other factors are held constant (Alesina & Dollar 2000). In addition, Coppedge et al. (2007) show that increasing levels of electoral contestation in recipient states is rewarded with increasing aid over time but increasing levels of inclusion in recipient states is associated with less aid over time.

2.2 Climate Aid

Early environmental aid focused primarily on conservation efforts. Following WWII, during a time of expansive international cooperation, the first intergovernmental international organization with an environmental mandate was founded in France, the International Union for the Conservation of Nature and Natural Resources (IUCN). After the creation of the IUCN, intergovernmental organizations (IGOs) and non-governmental organizations (NGOs) pursuing conservation and sustainability proliferated. The World Wildlife Fund (WWF) was established in 1961 as an international fundraising organization to preserve habitats and protect biodiversity. The Stockholm Conference in 1972 was the first major international summit to be held with a focus strictly on international environmental issues.

For modern-day climate financing, the pivotal summit was the 1992 UN Conference on Environment and Development, known as the Rio Earth summit. At this meeting, rich nations committed to helping developing countries implement the three conventions agreed upon at the summit[3] and established the Global Environmental Facility (GEF). The GEF is the main financial mechanism that supports the Convention on Biological Diversity (CBD) and

[3] The three conventions include the United Nations Framework Convention on Climate Change, the Convention on Biological Diversity, and the United Nations Convention to Combat Desertification.

the UN Framework Convention on Climate Change (UNFCCC) (Clemencon 2006)[4]. In 2010, the GEF was amended to be the financial mechanism for the implementation of the United Nations Convention to Combat Desertification (UNCCD 2020).

Another product of the Rio Earth Summit was the Rio Markers, which defined climate aid and enabled donors to categorize foreign aid appropriately when allocated towards environmental projects. The Rio Markers defined climate aid as financial resources transferred to other countries to assist in projects which preserve biodiversity, reduce desertification, and projects which enable climate mitigation. Climate aid for mitigation focuses on funding projects that will reduce carbon emissions (Michaelowa & Michaelowa, 2011). In 2010, markers were also included for projects aimed towards adaptation that will help countries adapt to the negative impacts of climate change (Dolsak & Prakash, 2018). Climate finance currently comes from three mains sources: private finance, public bilateral aid, and multilateral aid through international organizations such as the Global Environment Facility (GEF). The primary focus of this section will be on bilateral and multilateral climate aid. Private financing for climate finance is an important topic but outside the scope of this dissertation.

The debates on climate aid follow similar patterns to the debates in the larger foreign aid literature. Questions focus on what motivates donors to give climate aid and to whom. They also deal with questions regarding the effectiveness of climate aid. Research on the patterns of climate aid follow similar lines of thought to studies of foreign aid in general, finding that political and economic interests of donors determine patterns of climate aid more so than recipient need.

[4] The Convention on Biological Diversity is the international agreement with 192 signatories that commits all to biodiversity conservation and the UNFCCC is the United Nations body created to support global efforts to respond to climate change (UN, 2020).

2.2a Who Gives Climate Aid and Why?

Much of the climate aid literature advances hypotheses similar to the foreign aid literature, reaffirming that political and economic interests motivate donor's climate aid.[5] However, the climate aid literature is also unique in its investigation of two recurring themes in climate negotiations about who should pay for climate aid. First, the "common but differentiated responsibility" principle in the UNFCCC suggests that those who are historically responsible for the majority of emissions should be the ones to bear the burden of paying. Second, the capability to pay principle suggests that those who have the greatest ability to pay should use their resources to help those who lack this capability. Both of these principles imply that rich developed countries should be the main if not the sole providers of climate aid.

Investigating the characteristics of donor states who give climate aid, Klock et al. (2018) find support for the capability to pay argument but not for historic responsibility. Wealthier countries do indeed provide more climate aid in absolute amounts and per capita, than countries with fewer means.[6] In contrast, countries with the historically highest emissions do not contribute the most aid, the US being a notable example (Klock et al. 2018). However, when looking specifically at mitigation aid there are divergent results. Halimanjaya & Papyrakis (2015) find that GDP per capita of donors has no correlation with the amount of mitigation aid given and neither does historic responsibility. Some claim that donors with pro-environmental preferences will give more climate aid in general, but Klock et al. (2018) finds

[5] One caveat to this entire body of research is that many donors tend to overreport the amount of climate aid they contribute for international and domestic political purposes (Michaelowa & Michaelowa 2011; Weikmans & Timmons Roberts 2019).

[6] The relative amount donors give does shift when comparing absolute amounts and per capita. For example, the United States is the 4th highest climate aid donor in absolute amount but drops to the 20th largest donor in terms of per capita amount (Klock et al., 2018).

that “greenness” associated with higher educational attainment has no correlation with levels of climate aid. In contrast, when interacting the level of domestic climate ambition with historic emissions, Peterson (2022) finds a positive correlation and similarly so with GDP per capita. Peterson’s study focuses on how international finance choices are conditional on domestic ambition. Finally, Klock et at (2018) find that government effectiveness of donors themselves is an important factor in determining how much climate aid donors give in total. In contrast, when interacting the level of domestic climate ambition with historic emissions, Peterson (2022) finds a positive correlation and similarly so with GDP per capita. Peterson’s study focuses on how international finance choices are conditional on domestic ambition. Despite the concepts of capability and historic responsibility dominating climate negotiations and political rhetoric in principle, scholarship finds conflicting support that these concepts motivate donors in practice.

Similarly to the foreign aid literature, studies of climate aid find that political and economic interests drive donor’s climate aid. An early study by Lewis (2003) finds that donors give climate aid to states with whom they trade, to whom they sell arms, and have similar political leanings (other democracies). A recent study tracking climate aid from 2002-2017 shows that donors give more significantly more climate aid to countries that the donor exports large amounts of goods to which reaffirms the idea that economic interests of donors tend to drive their climate aid choices (Bayramoglu et al. 2022).

Donors also do not target states that are in need of aid to help with local pollution problems and instead prioritize aid projects that will benefit themselves and the global commons over recipient’s local needs. This mismatch between need and climate aid allocation shows the division in goals between the global north, that are conventionally the donors, and

the global south, which tend to be the recipients. The assumption is donors want to finance "green" projects that will protect biodiversity, but recipients want help financing "brown" projects that deal with local air and water pollution (Lewis 2003). For example, Halimanjaya (2015) finds that countries with large carbon sinks, specifically expansive forests, and high levels of deforestation are more likely to receive climate aid than countries without these globally beneficial resources[7]. This shows that with climate aid, donors are not acting out of altruism or a desire to help developing countries but are instead only willing to allocate aid to places and projects which further their own interests.

While much of the literature finds donors to be self-interested actors, the same interests do not motivate each donor. For example, in a comparative study Figaj (2010) finds clear variation in the climate-aid motives of Japan and the US. Japan gives climate aid mainly to other Asian countries with low poverty rates, that have ratified environmental treaties and most importantly, have strong economic ties with Japan. In contrast, the United States targets climate aid towards geopolitically useful countries such as Egypt, or countries with a high degree of deforestation (to preserve biodiversity). There is also evidence that donors favor states with whom they formerly had a colonial relationship (Hicks et al. 2008; Lewis 2003; Figaj 2010). However, others find that the colonial ties connection does not hold for small island developing states (Robinson & Dornan 2015). Discussions on capability, historic responsibility and the political and economic motives that drive donors are a large portion of the climate aid literature but tend to oversimplify the complex dynamics and political pressures governments endure regarding the issue of climate change.

[7] The relationship between forest size and being selected to receive is positively correlated as Halimanjaya (2015) explains, "the log odds of being selected as a recipient of mitigation finance rise by 2.1% if forest area rises by 10%" (p. 234).

There is some literature that begins to expand the scope of what drives donors' climate aid preferences and includes domestic constituencies, finding that economic interests within states have preferences over climate aid. McLean (2015) finds that relevant economic actors that have a comparative advantage, preferring aid to be allocated to multilateral climate funds over bilateral climate aid because it increases the pool of countries that can buy their goods[8]. Conventional wisdom suggests economic groups prefer bilateral aid because donors can make this tied aid, meaning the donor states can force the recipients to buy goods from their home industries (Morrissey 1993; Younas 2008). In addition, Peterson (2022) finds that donors with carbon intensive industries provide less climate finance. These studies take into account domestic economic interests which provides grounds for further research into the role of economic interests in the allocation of climate aid.

Some studies of climate aid also begin to bring in the role domestic political institutions as well. In the 1980s and 1990s opportunistic domestic political alliances in the US led to USAID (the U.S. agency that administers bilateral foreign aid) directing more funds towards biodiversity conservation (Corson, 2010). Variation in the mandate and power structure of domestic bureaucracies who oversee allocating the state budget also matter in the allocation of climate aid (Marcoux et al. 2013; Pickering et al. 2015; Peterson & Skovgaard 2018). Halimanjaya and Papyrakis (2015) write that "transparent and inclusive governance structures allow citizens and interest groups to express their views on environmental issues and exert pressure on their governments to take action, both domestically as well as internationally" (p.

[8] The multilateral funds included in this study were the Global Environmental Facility which is the financial mechanism supporting efforts by the UNFCCC and Montreal Protocol's fund. The latter has the specific job of allocating aid to projects which helps states reduce their use of ozone depleting chlorofluorocarbons (CFCs).

6). Though Klock et al., (2018) found that higher numbers of green party parliamentary seats have a negative correlation with climate aid and Halimanjaya and Papyrakis (2015) find a similar relationship with left wing party seats and climate aid.

2.2b Who Receives Climate Aid and Why?

As with foreign aid, research on the recipients of climate aid shows that who receives aid tends to reflect donor preferences rather than aid being allocated based on need. A major commonality found in the literature about who receives climate aid is that donors tend to allocate aid based on recipient merit, meaning recipients that donors find to be more deserving of aid because their domestic institutions are more similar to the donor's than other candidates for aid. Donors prefer to give climate aid to countries that they deem deserving because donors think they will be more likely to use the aid in productive ways. Many studies use governance scores and find that donors assume recipient states with good governance will be more likely use the aid in an effective and efficient manner and thus receive more climate aid than those with poor governance (Hick et al. 2008; Halimanjaya, 2015; Halimanjaya & Papyrakis 2015; Robinson & Dornan, 2017; Weiler et al. 2018)[9]. Additional works find that donors prioritize states with democratic characteristics because leaders in democracies are more likely to be held accountable if aid is misappropriated (Halimanjaya 2015; Robertsen et al. 2015). However, it must be considered that this may be a result of donor political motivations because as previously noted, donors tend to give aid to countries with similar political leanings, and most donors are democracies (Lewis, 2003). The merit of recipients is an important explanatory

[9] Good governance indicators include, levels of democracy, environmental transparency and the Worldwide Governance Indicators (control of corruption, voice and accountability, rule of law, political stability and lack of violence, government effectiveness, regulatory quality).

variable for who receives aid and is included at least as a control in most studies on climate aid. This is an interesting finding because results on the impact of good governance are less consistent in studies of foreign aid in general.

The climate aid literature is divided on the question of recipient need: Do states that are more vulnerable to the impacts of climate change receive more aid? The logical answer should be yes, but as prior literature has shown, donor interests, not recipient need, tends to drive both foreign aid and climate aid (Berthelemy 2006; Dreher et al, 2009; Lewis 2003; Hicks et al. 2008). Overall, vulnerability to climate change has not been proven to be an accurate or reliable predictor of who receives climate aid. Figaj (2010) finds that the economic interests of donors far outweigh vulnerability considerations, though some donors do support states facing declining biodiversity. Klock et al. (2018) find that vulnerability is actually negatively correlated with receiving aid, and Doshi and Garschagen (2020) similarly find that the most vulnerable countries are not prioritized for receiving adaptation aid. For example, certain countries in Sub-Saharan Africa are particularly vulnerable, but in that region, the most vulnerable nations are not the ones that receive the most aid (Robertsen et al. 2015). A recent study adds some complexity, suggesting that vulnerability and the amount of aid countries receive is not a linear relationship. Vulnerability becomes an important driver for states when a certain threshold of vulnerability is met (Basty & Ghachem 2022).

Another complication in the literature centers on the definition of vulnerability. A study dividing vulnerability into two types, physical exposure and adaptive capacity, finds that the former is associated with higher levels of aid, while the latter is associated with lower levels of aid (Weiler et al. 2018). The same study also found economic interests to be an important driver. The story is more promising for small island developing states which receive more aid

when physical exposure is higher and when adaptive capacity is lower (Robinson & Doran, 2017). These countries are exposed to certain risks such as sea level rise and are more likely to receive adaptation aid specifically due to this vulnerability (Betzold & Weiler 2017, Scandurra 2020). Even so, there is no consensus in the literature that donors allocate bilateral aid to states that are the most vulnerable to the impacts of climate change.

The literature is also divided on the role of vulnerability in driving funding from multilateral aid institutions. The Adaptation Fund (AF) was created under the UNFCCC and was an institution that came out of the 1997 Kyoto Protocol to help vulnerable developing nations adapt and develop the capacity to deal with the impacts of climate change. Despite this mandate, many have found that the Adaptation Fund does not prioritize the most vulnerable countries (Persson & Remling 2014; Remling and Persson 2015; Stadleman & Castro 2014, Michaelowa et al. 2020). Challenging this conclusion, Mori et al. (2019) find that more vulnerable countries do have more access to aid from the Adaptation Fund and that more vulnerable countries who also lack adaptive capacity receive higher amounts of aid from the AF. More broadly, international organizations tend to direct aid towards projects which fall under their organizational mandate. The World Bank, for example, focuses its aid on development projects while the Global Environment Facility targets countries with high emissions but a history of international environmental commitments (Figaj 2010). There is no definitive conclusion on the impact of vulnerability on donor decisions or international organization decisions, but the research thus far shows us that many factors impact these outcomes, and it is most certainly not vulnerability alone.

2.3 Why Foreign Aid and Climate Aid Matter: Aid Effectiveness

As the literature on foreign aid and climate aid show, neither is given as kindness from altruistic donors to recipients who need assistance the most. Instead, aid is given with strategic intent. Despite this, in some cases, aid does have a positive impact on outcomes in recipient countries and regardless of outcomes, there are countries in need of assistance. The effectiveness of aid is important to examine because this a way to consider how and when aid can make a difference in recipient countries. The following section discusses when aid is effective. In the foreign aid literature, results are mixed on when and under what conditions aid is effective. Likewise, studies on the effectiveness of climate aid are largely inconclusive and require future research. Yet, we can learn lessons from the foreign aid literature that could be applied to increasing the effectiveness of climate aid. These lessons include putting conditions on climate aid, increasing dependency between the donor and recipient, the close relationship between strong institutions and effective aid and importance of extending the shadow of the future for climate aid.

2.3a When is Foreign Aid Effective

The literature is split in regard to the question of the effectiveness of foreign aid in achieving its goals. The most common goals of non-humanitarian aid are economic growth, improving political accountability, and conflict reduction (Qian, 2015). Most of the aid effectiveness literature focuses on economic growth, although some attention is also focused on political accountability.

Some studies find that under certain conditions foreign aid improves economic growth (Burnside & Dollar 2000; Hansen & Tarp 2000; Clemens et al. 2004; Sachs et al. 2004; Qian 2015). Other studies find that when subjected to robustness tests, the conclusions of economic

growth do not hold (Hansen & Tarp 2001; Easterly et al. 2004; Roodman 2007). Moreover, some find that aid does not have an impact on economic growth in one way or another (Rajan & Subramanian 2008). One key factor influencing effectiveness are the behavioral changes required from recipient countries. Adding conditions onto aid is the main way donors and international organizations attempt to guarantee this behavior change. Foreign aid is not usually a gift and comes with strings attached.[10] Donors frame foreign aid conditions as being necessary to ensure that aid is used correctly but the conditions are often advantageous to donors as well.

Aid targeted towards improving economic growth in developing countries often requires recipients to change their domestic economic policies. Aid has shown some success in promoting economic growth when the recipients implement "good" economic policies, such as low inflation, open markets, and low budget deficits (Burnside & Dollar, 2000). These types of conditions may benefit the recipient, but liberalizing reforms such as fewer trade restrictions or more secure property rights can also open up developing economies to foreign economic actors and provide access and opportunities for economic interests in donors (Wright & Winters, 2010). Others have criticized the relationship between economic policy change and economic growth. Recipients that have not implemented these "good" economic policies still have a positive relationship between foreign aid and economic growth (Hansen & Tarp 2000). Other critiques find that the relationship between aid and economic growth does not hold when

[10] Baldwin (1985) writes "gift-giving generates an obligation to reciprocate regardless of whether any specific quid pro quo is agreed upon at the time the gift is given. Indeed, the giver is likely to—nay, is expected to—deny, explicitly or implicitly, that any quid pro quo is expected. This, however, is a social lie and is tacitly understood to be such by both the giver and receiver… Once the socially deceptive rhetoric associated with gift-giving is recognized for what it is, treating foreign aid as an instrument of statecraft is easier." (p. 294)

scholars control for human capital (Hansen & Tarp 2001). [11] Another consideration is the recipient country's economic growth over time. Clemens et al. (2004) find that foreign aid leads to short-term economic growth regardless of domestic economic policies, yet the effects of aid has diminishing returns after 4 years on average.

Despite most foreign aid coming with strings attached, recipients do not always follow through on their promises to comply with the conditions attached to aid. One reason is that aid is fungible, thus allowing for misuse of aid in cases where aid usage is not observable and enforceable (Drezner 1999). Furthermore, implementing new policies (economic policy in particular) is costly to leaders in recipient countries because shifting economic policies can hurt sectors of their own domestic population (Bearce & Tirone 2010). The main incentive for a recipient to shift its economic policies is a credible threat of aid being withdrawn if conditions are not upheld (Bearce & Tirone 2010). The potency of a threat to stop sending aid depends in part on the dependence of the recipient on the aid and the credibility of the threat. Dependency cuts both ways. This is a critical point to consider when examining donors aid choices in regard to conditionality. If a donor wants to gain concessions from a recipient state, it will be more successful when it makes the recipient dependent on the aid it provides (Hisrchman 1980; Baldwin 1985). In addition, recipients are more likely to comply when aid flows are not given an expiration date, extending the shadow of the future (Drezner 1999). Alternatively, there are incentives for donors to continue giving aid even when conditions are not met because the relationship has already been established and past money has already been invested (Graham & O'Hanlon, 1997).

[11] Mean years of education at the primary and secondary level is used as a measure of human capital in their model.

Domestic political institutions also condition the effectiveness of aid, which is how scholars currently explain the inconsistent result of foreign aid on economic growth (Wright & Winters 2010). When a recipient has good domestic governance, and specifically, an environment conducive to entrepreneurship and growth,[12] aid for economic growth has been found to be successful (Burnside & Dollar 2004). In support of this, other studies find that the effectiveness of aid is conditioned on regime type,[13] where democracies are able to use aid to improve quality of life and autocracies do not (Kosack 2003). Furthermore, studies find that governments that invest in human capital have better economic outcomes with aid (Kosack & Tobin 2006; Gomanee et al. 2005; Mosely et al. 2004).

Foreign aid is also aimed at improving political accountability, although findings regarding achieving accountability goals are also mixed. Foreign aid can change domestic conditions in recipient countries for the better and sometimes for the worse. For political accountability, foreign aid can lead to democratization when the leadership of the recipient country must maintain a large distributional coalition. Leaders who require a large coalition of the population to remain in power use aid to provide public goods (Winters 2010). In contrast, foreign aid can increase corruption in recipient countries and thus may impede democracy (Alesina & Weder 2002; Qian 2015). The logic behind the negative impacts of aid on domestic institutions is similar to research on the resource curse: without strong institutions, aid can make things worse (Mehlum et al. 2006). Aid provides the government with an alternative source of income. This reduces the need for the government to tax its people and loosens the

[12] Good governance that allows for entrepreneurship and growth is operationalized by Burnside & Dollar (2004) using the worldwide governance indicators. These includes index measurements of, rule of law, voice and accountability, political stability and absence of violence, control of corruption and government effectiveness.

[13] Regime type is operationalized using the Polit IV index. This includes a composite index that measures competitiveness of political participations, openness and competitiveness of executive recruitment and, constraints on the executive.

relationship between the government and its citizens. This can end up reducing democratic sentiment in the domestic population and incentivizes corrupt behavior by the government (Moss et al. 2006; Morrison 2007, 2009; Djankov et al. 2008). The resulting impact of aid on political accountability is unclear. In some cases, aid can encourage democratization, while in others, foreign aid can prop up authoritarian regimes or degrade democracy.

2.3b When is Climate Aid Effective?

Finally, in the fight against climate change we need to consider: When is climate aid effective? There are numerous barriers to answering this question. First, the literature on climate aid effectiveness is limited, so many questions are unresolved and require more research. Second, many studies have problems with measurement, conceptualization, and overall poor data (Kono & Montinola 2019). Despite these challenges, the climate aid literature has applied a few of the key insights from the forging aid literature to the effectiveness of climate aid discussion but not extensively. Some works highlight the close relationship between strong institutions and effective aid and the importance of conditionality but do not consider other aspects such as increasing observability and enforcement of conditions, building dependency between donors and extending the shadow of the future of aid, each of which could be invaluable in increasing the effectiveness of climate aid.

The broader research literature on environmental aid offers a starting point for considering the effectiveness of climate aid. One of the earliest works on environmental aid identifies two aspects of aid effectiveness. Keohane & Levy (1996) define project effectiveness as "how well, relative to costs, a single financial transfer or set of transfers contributes to solving a particular environmental problem or set of problems, given the way the problems are defined and preexisting institutional arrangements" (pg. 15). They define aggregate

effectiveness as "the extent to which environmental aid programs fulfill their potential ability to solve or alleviate environmental problems" (pg. 15). Definitions of project effectiveness in climate aid vary widely. Project effectiveness depends on the goals of the aid given. In some cases, aid is given to reduce local pollution problems. Effective aid would see a reduction in the problem. Other aid is given to build adaptive infrastructure where effectiveness could be project completion. Aid is also given for mitigation, where the amount of carbon reduced or sequestered is the measure of effectiveness.

The Montreal Protocol provides an example of aggregate aid effectiveness. The international regime centered on eliminating ozone-depleting-substances, which also happen to be potent greenhouse gases, is one of the few environmental treaty regimes to be credited as successful in achieving its goals.[14] The environmental aid distributed under the auspices of the Montreal Protocol was central to its success. When the protocol was first proposed many countries in the Global South did not sign onto the agreement because it did not include a mechanism for distributing aid to those who required assistance phasing out chlorofluorocarbons (CFCs). The Global North resisted creating a formal aid mechanism because they were concerned about getting trapped footing the entire bill. Eventually, a compromise was struck, and The Fund was created. Adding this formal aid mechanism to the Montreal Protocol is the main reason why this agreement eventually got global participation and why the world was ultimately mostly successful in phasing out CFCs. Global participation allowed for the harmonization of regulation in the market which changed incentives for domestic producers who used CFCs (Falkner, 1998).

[14] There has been an increase in CFC's emissions from eastern China in recent years (Rigby et al. 2019) so the success of Montreal is not unequivocal.

A few studies reference the importance of the relationship between climate aid effectiveness and the capacity and institutional strength of the recipient country. Some claim that climate aid is only likely to be effective when given to a recipient that has the capacity and strong enough institutions to use the aid effectively. Others argue that climate aid can be ineffective when linked to development aid which is often assumed to help build recipient capacity and strengthen institutions. Based on their analysis of the Montreal Protocol and other environmental aid mechanisms, Keohane & Levy 1(996) suggest that aid effectiveness hinges on the capacity of the recipient, the level of environmental concern of the donor, and the type of contract agreed between the donor and recipient. Their theory is echoed in some of the more recent studies of climate aid that identify recipient capacity as key to the effective use of aid (Hicks et al. 2008; Victor 2018). However, climate aid may also be ineffective when it is linked to development aid in ways that do not work. Ayers and Huq (2008) argue that official development assistance and adaptation aid from the UNFCCC need to do much more to complement one another to achieve their goals. Specifically, adaptation aid and development aid need to do more to work together to build strong institutions and recipient capacity. Yet, development and climate vulnerability have been found to be intricately linked (Hicks et al. 2008; Victor 2018), but currently these two types of aid have a history of competing with each other in ineffective ways. Despite this, all but three of the international climate funding institutions rely on official development assistance (Victor 2018). Meanwhile, others call for a complete restructuring of development aid institutions to fit with the new environmental context of today (Ardnt & Tarp 2017, Scoville-Simonds 2020). Climate aid can help recipients build the necessary capacity but will only be effective in doing so with strict conditionality (Victor 2018). However, other research suggests that climate aid can undermine the capacity

and legitimacy of the recipient government. Barnett's (2008) case study of Niue finds that climate aid actually degrades governance in this small developing island states because the aid allocation process undermines the legitimacy of the government. Niue is so dependent on the aid the government receives that citizens view the government as being more beholden to the aid donors than their own population.

This suggest one lesson the climate aid literature can take from the foreign aid literature: the necessity of conditionality of aid in junction with monitoring if those conditions are met or not. Keohane & Levy (1996) emphasize the necessity of credible commitments in any aid transaction. Contracting is a key part of solving conflicts over the distribution of climate aid because it reduces information asymmetries and enables enforcement mechanisms, both of which are necessary for donors and recipients to make credible commitments. Hicks et al. (2008) write, "environmental assistance should be conceived as a cooperative contract that implies mutual policy adjustment by both donor and recipient" (p. 263). However, they find that many climate aid relationships are not in practice treated as contractually binding, which reduces the likelihood of climate aid being effective. Drezner (1999) argues that in order for conditionality to work, aid must be observable and enforceable, meaning donor countries need to be able to track if recipients are following through on their conditions. There has been little work on how countries attempt to monitor how climate aid is being used but increasing monitoring in an effective way is likely to increase the effectiveness of climate aid.

Other lessons can be taken from the literature on foreign aid effectiveness and applied to climate aid such as the necessity of creating dependency between donors and recipients and the importance of increasing the shadow of the future for the aid relationship. These two concepts work in tandem when dependency is established, the relationship is likely to extend

into the future. Aid is unlike trade where dependency is almost a forgone conclusion. But climate aid.

2.4 Limitations of the Existing Literature

The three major questions guiding foreign aid and climate aid research are: Who gives aid? Who receives aid? And when is aid effective? Across analyses, research finds that donors tend to be wealthy developed countries and that the political and economic interests of donors drive the allocation of aid. Recipients are less developed countries, although not necessarily the poorest. Foreign aid is not given to states that are the poorest nor is climate aid given to states that are in most vulnerable to the impact of climate change. Findings are less clear on the effectiveness of aid. The success of aid in increasing economic growth and the political accountability are debated, while studies on the success of aid in solving environmental problems are still inconclusive.

I argue that there are three key limitations to the climate aid literature: (1) the lack of consensus on the drivers of donors' climate aid preferences; (2) addressing climate aid as if it is the same as general foreign aid; and (3) theorizing climate aid donors as unitary actors or black-boxing states and thus excluding interactive effects among domestic constituencies and institution. My research addresses these three issues. I begin to unpack the black box of donor states and understand the interactive processes at work in domestic politics which shape the aid priorities of donors. I argue that economic interests and domestic institutions shape donor preferences. The economic actors most relevant and most likely to have a stake in the outcomes of climate aid are the interests of the energy industries but the ability of these interest groups to influence policy is likely to depend on the domestic institutions within the donor state. Recognizing that climate aid is unique relative to other types of aid is necessary because unlike

other types of aid, climate aid will be transformative, with long-term implications for the energy industry.

2.4a: No Consensus on the Drivers of Donor Preferences

While three recent studies have all directly addressed the question of what drives donor preferences regarding climate aid (e.g., Halimanjaya & Papyrakis 2015, Klock et al. 2018, Peterson 2022), there is little consensus amongst these studies. All three studies investigate similar drivers—testing hypotheses about donors' responsibility for causing climate change and donors' capacity to pay for climate aid—however results are inconsistent. For example, Klock et al. (2018) find that historic CO2 emissions, a measure of responsibility, are negatively correlated with climate aid, while Peterson (2022) finds a positive correlation when CO2 emissions are interacted with domestic climate ambition. Halimanjaya & Papyrakis (2015) do not find CO2 emissions to be a significant indicator for climate aid commitment or disbursement. A similar story emerges for capacity; Klock et al. find GDP per capita to be a strong predictor of more climate aid. Peterson (2022) finds a strong opposing correlation when interacting GDP per capita with domestic climate ambition, and again Halimanjaya and Papyrakis (2015) do not find significant results. These divergent results may be due to different empirical approaches to operationalizing the dependent variable, climate aid.

The other variables these studies test provide similarly conflicting results. For donor vulnerability to climate change, Peterson (2022) finds a negative relationship between vulnerability of a donor to climate change and the amount of climate aid provided when vulnerability is interacted with domestic climate ambition. Klock et al. (2018) finds a similar negative relationship but only in one model out of twelve is this result significant[15]. For

[15] Klock et al (2018) tests their vulnerability hypothesis using two different measures of vulnerability and then using six different operationalizations of their dependent variable. The vulnerability measure includes the Notre

domestic political parties both Klock et al (2018) and Halimanjaya and Papyrakis (2015) find consistent but surprising results. The former documents that the number of green party seats in parliament is negatively correlated with climate aid, and the latter finds that the number of left-wing party seats is also negatively correlated with climate aid. Furthermore, Peterson finds that domestic climate ambition is positively correlated with higher amount of climate aid, while Halimanjaya and Papyrakis (2015) find that domestic environmental expenditures is negatively correlated with the provision of climate aid.

What we learn from these studies is that there are relationships between the characteristics of donor states and the provision of climate aid, but the literature is not consistent on what these relationships are. I contend that a potential reason for these inconsistencies is a lack of understanding of the domestic drivers of donor preferences regarding climate aid. This dissertation expands on the domestic interests that may seek to influence climate aid priorities, focusing specifically on competing segments of the energy industry and on their interactions as mediated by domestic political institutions.

2.4b The Distinctive Features of Climate Aid

The second limitation of the climate aid literature is that it analyzes the processes driving climate aid as similar to the processes driving foreign aid. Yet the goals of climate aid are to transform the global economic system, and thus it is of particular importance for research to include the economic actors that this systemic shift will impact. Because climate aid has the potential to transform the global economy, the stakes are simply higher. Climate aid research does not do enough to emphasize the structural differences inherent in aid that is directed

Dame Global Adaptation Index and the Transnational Climate impacts Index. The six dependent variables include climate aid that is flagged as principle and is targeted towards adaptation and mitigation, mitigation only, adaptation only and then the same variables with significant aid included at a 50% discount.

towards solving this global problem. If successful, climate aid will be transformative. In contrast, other types of foreign aid to reduce conflict, increase political accountability, or encourage economic growth are less likely to systemically transform the world we live in and are instead focused on political transformations in specific countries rather than across the globe.

The main reason climate aid is likely to have greater economic costs and benefits to domestic industries than other types of aid such as development aid is because climate aid generally will change the status quo while development aid in many ways maintains it. First, while development aid has an eye to the future as climate aid does, most development aid aims at creating a future that maintains a similar economic system that have today. For example, development aid intended to improve infrastructure in a country is done so for many reasons, but a core one is to enable economic production and trade (Burnside & Dollar 2000; Hansen & Tarp 2000; Clemens et al. 2004; Sachs et al. 2004; Qian 2015; Easterly et al. 2004; Roodman 2007). This goal fits with the current economic system and maintains the status quo, thus is unlikely to be a goal economic interests oppose. In contrast climate aid that seeks to help countries to mitigate climate change will likely challenge the status quo, which economic actors more likely to take issue with. Unlike foreign aid, the economic actors with vested interests in the allocation of climate aid are more clearly identifiable. Resource-intense industries, the fossil fuel industry in particular, have clear motives for discouraging the disbursement of climate aid. For example, 63% of climate aid intended for mitigation purposes is invested in renewable energy generation (Buchner et al. 2019). This is much more transformative than development aid because it is directed towards transforming how these

countries provide energy. Transformative directives such as climate aid are likely to have larger economic costs and benefits to economic actors.

The consequences of underproviding climate aid also underscore the high stakes of this type of foreign aid compared to other types of foreign aid. Financing the fight against climate change poses a global collective action problem. It is the view of many that the providing of climate aid is necessary, but states struggle to act collectively in doing so (Clemencon 2006; Hicks et al. 2008). As past contributions have shown us, one or even a small collection of states have been unwilling to pay for climate aid alone. Nor can one state single-handedly fix the problem of climate change or finance its solution. However, a change in one state's policies will impact the likelihood of other states shifting from the status quo as well. Therefore, understanding the drivers of donor states' climate aid preferences takes on added significance.

2.4c Mischaracterizing Donor States as Unitary Actors

In light of the inconsistent findings of climate aid donor preference research and of the transformative implications of climate mitigation for global energy systems, attention needs to shift to how energy industries seek to influence climate aid. However, most studies on climate aid do not unpack the formation of state policy and instead simply assume donor state preferences for giving aid. Studies of foreign aid and climate aid black-box states and exclude internal political cleavages over the distributional impacts of aid. Most of the literature turns to the relationship between donors and recipients, using trade ties and the allocation of aid to approximate the economic interests of donors. This is not adequate to explain donor state preferences regarding climate aid. Doing so assumes that the internal characteristics of states only impact outcomes in a minimal or random way and can be treated as an intervening variable that merely accounts for residual variance in outcomes (Evans et al, 1993). However, research

in other IR fields makes clear that state interests are not given. For example, many studies in international political economy (IPE) show us that domestic politics is important for determining the foreign-policy preferences of states (Rogowski 1989; Hiscox 2001; Madeira 2015; Frieden 1988, 1991, 2015). Cleavages between different sub-national units within states shape preferences first and foremost. Domestic politics playing out within states create donor preferences. This is likely to be true for climate aid as well, given high stakes distributive effects on domestic groups of addressing the climate problem.

Other research has also identified this limitation of the climate aid literature. For example, Roberts (2014) criticizes how the foreign aid literature has treated studies of aid only in terms defined through the lens of nation states. He digs into the complex network of operations occurring behind the scenes of USAID and find a vast network of actors profiting from development projects he calls the development-industrial complex. In line with this critique, I argue that domestic energy industries have vested interests in the allocation of climate aid and should be brought into such explanations. My research thus extends work that has considered the domestic politics of climate aid decisions, which has focused on political parties (Halimanjaya & Papyrakis 2015; Klock et al. 2018), domestic climate ambition and carbon-intensive industries (Peterson 2022). I hypothesize that the specific character of the domestic energy sector contributes to explaining patterns in national contributions to climate aid. Economic actors have vested interests in where aid is allocated, and they are likely able to gain from influencing policy choices and the conditions tied to foreign aid. Any action to mitigate or adapt to the impacts of climate change will have direct impacts on the economic actors that have dominated the economic landscape over the century, namely the fossil fuel industry. Furthermore, these actions have the potential to empower and benefit new actors such

as the renewable energy industry. To understand the dynamics and drivers of climate aid we need to include the role that these important actors play in shaping the political landscape of climate aid. Finally, we need to consider the interactions across these constituencies and their effects on donor preferences.

The following chapter develops the hypotheses of this dissertation. I argue that energy sector constituencies within states have preferences over climate aid allocation and therefore will compete to influence state preferences. When the donor state relies heavily on fossil fuels for its energy consumption, the fossil fuel industry will be better able to influence donor's climate aid choices. When the donor country has a renewable energy industry with the likely ability to be a provider of future energy, the renewable energy industry will be better able to influence their states climate aid choices. These constituencies will have a varying ability to influence state preferences depending on the domestic institutional context they have to navigate and their relative potential. The following chapter will explain these propositions and propose hypotheses to test this theory.

3. Domestic Drivers of Climate Aid: Interests and Institutions

Adapting to the impacts of climate change and trying to mitigate those impacts by reducing emissions will require a massive mobilization of finance. Developing countries expect rich developed countries to foot this bill because rich countries are the ones responsible for causing climate change and developing countries simply do not have the ability of finance adaptation and mitigation efforts alone. To date, rich countries have made promises to provide funding and have made some contributions to climate aid, although there is large variation in how much some rich developed states contribute to climate aid in comparison to others. To understand why this is, we need to look at how the formation of climate aid preferences in the donor states. More specifically, to understand how donor's climate aid preferences are formed, research needs to consider relevant economic interests and the domestic institutional context of each donor state.

3.1 Theorizing Domestic Interests and Domestic Institutions in Foreign Policy Preference Formation

3.1a Domestic Interests

Although early work on foreign policy treated states as unitary rational actors (Waltz 1976; Krasner 1978; Brooks et al. 2012), many studies have shown that politics does not stop at the water's edge. State foreign policy preferences are in part the product of internal politics and should never be considered as given a priori. Domestic politics do not remain bound within national borders and have been found to impact foreign policy in many cases (Rogowski 1989; Hiscox 2001; Madeira 2015; Frieden 1988, 1991, 2015). When assessing how foreign policy preferences come about, you need to open the black box of states.

Frieden (1988) analyzes the seemingly irrational and conflicting foreign policy choices of the US during the period between WWI and WWII to disprove the unitary-actor assumption. After WWI, the US emerged as a powerhouse in the international system, while Europe was severely weakened. Due to this relative power disparity, one would expect the US to engage with Europe because the world was capital starved and by the 1920's, the US was the world's best option for capital lending (Frieden, 1988). The international system set the conditions for the US to engage, but instead the US struggled with internal disputes about what US foreign policy should look like, with politicians debating internationalism versus isolationism (Frieden, 1988). These conflicting foreign-policy preferences emerged because domestic economic groups favored different approaches to international engagement. The surge of overseas lending in the 1920's was unevenly distributed across sectors in the US. International banks and corporations wanted the US to join the League of Nations and finance the reconstruction of Europe. In contrast, domestic-oriented industries wanted the opposite, preferring the US focus on protecting US industry (Frieden, 1988). This conflict resulted in a disjointed and at times contradictory US foreign policy during the inter-war period. It was not until the Great Depression that the stalemate between these interests began to break down. This example illustrates that the state cannot be seen as a unitary actor that simply responds to the international system because domestic factors influence foreign policy preferences as well. Frieden (1988) explains, "the national interest is not a blank slate upon which the international system writes at will; it is internally determined by the socioeconomic evolution of the nation in question" (pg. 88).

Other studies have expanded on the role domestic interests can play in influencing US foreign policy. When looking at interest groups in particular, the main mechanisms through

which interest groups can have influence is through framing the debate, helping congress provide policy oversight and being a source of information and policy analysis (Dietrich 1999; Milner & Tingley 2015). These levers of influence only play a role in influencing foreign policy in the early stages of decision-making, which minimizes the influence interest groups can have on US foreign policy. In addition, international circumstances always mediate influence because the US's position in the international system fundamentally shapes US foreign policy. Thus, policy options only become viable based on international events or long-term trends. For example, Tiananmen Square empowered human rights activists in shaping US policy towards China, then international circumstances changed. A negative security spiral in relations between the US and China in the early 2000's forced the US to focus on economic ties between the nations, effectively sidelining human-rights concerns (Dietrich 1999).

Ethnic groups also try to influence US foreign policy. Haney & Vanderbush (1999) unpack how the Cuban American National Foundation (CANF) was able to wield influence in tandem with the Reagan administration in the early 1980's though, this was only because CANF's interests aligned with the Reagan administrations interests. The international circumstances of the Cold War and Reagan's position on fighting the spread of communism in the Latin America made CANF a convenient ally for the administration (Haney & Vanderbush 1999). This case identifies another role that domestic interests can play, serving as allies to governments and idea makers. This goes against conventional wisdom that, particularly during the Cold War, foreign policy is the domain of the President alone. Instead, this case shows that domestic groups can play a role in foreign policy even in the "high politics" security situations of the Cold War. Additionally, this case goes against the assumption that interest

groups are mainly concerned with domestic issues, instead showing that interest groups can also have a stake in foreign policy.

Out of the many types of domestic interest groups, who has the most influence? Jacobs and Page (2005) measure who has had the most impact on US foreign-policy outcomes with a time series study of four different domestic interest groups in the US. Their study focuses on international-oriented business interests, experts or epistemic communities, domestic oriented labor groups, and general public opinion. Each group has a stake in US policy decisions, but each group does not have equal influence. The study finds that business has the most influence over time and in different institutional settings, followed by experts, while labor groups overall only have minimal influence and public opinion, despite being the focus of much research on US foreign policy, wields little to no influence over foreign-policy decisions.

Research on trade policy also suggests that coalition building can be central to foreign policy influence. When looking at trade policy, many scholars in IPE focus on the role of domestic interests, asking why do economic actors form the coalitions and what explains their preferences for protectionism or liberalization? The starting point for trade preferences is based on relative resource endowments of land, labor and capital. The Stolper-Samuelson Theorem suggests that owners of abundant resources prefer trade liberalization while the owners of scarce resources favor protectionism. This model suggests international trade preferences are about who gains and who loses materially from international trade. Adding to the nuance of domestic coalition formation around international trade preferences, others have taken into account the impact of another domestic-level variable, the degree of inter-industry factor mobility within a county (Hiscox, 2001). Instead of focusing only on resources endowments, the degree to which factors are mobile between different industries will also impact the types

of political coalitions that will form around international trade preferences. If factors are highly mobile, coalitions will form along class lines as the Stolper-Samuelson theorem predicts, but if factors are not mobile, coalitions will form along industry lines (Hiscox, 2001). This variation in coalition type is again based on who wins and who loses materially from an expansion or restriction in trade.

The expansion or restriction of trade in the international system also impacts domestic political cleavages over trade preferences. When there is an expansion in trade, owners of abundant resources become more powerful and will be more active in politics. Conversely, when there is a restriction in international trade owners of scare resources become more powerful and more politically active (Rogowski, 1989). An exogenous expansion or restriction of trade at the international level has a moderating effect on the power of domestic coalitions. For example, how global trade has changed overtime important for explaining the shifting nature of domestic coalitions. Prior to WWII, inter-industry trade was dominant, and states would specialize in producing products in which they had a comparative advantage, based on their resource endowments. During this time coalitions formed along industry or class lines as discussed above. Increasing trade liberalization followed WWII and changed incentives for firms. Instead of comparative advantage driving firms, they shift to increasing returns-of-scale and making differentiated products to meet consumer demand (Madeira, 2015). Expanding global trade create new international conditions causing trade preferences to form at the firm level. Large export-oriented firms with economies of scale have lower adjustment costs when entering the international marketplace favor liberalization, which is not the case for small domestic oriented. The result of this increase in intra-industry trade is that the old broad-based coalitions, which formed around classes or industries, have been undercut (Madeira, 2015).

Instead, in the current era, because preferences for trade policy form at the firm level, individual firms have become more active in the making of international trade policy.

3.1b Domestic Institutions

Domestic institutions also factor into the formation of foreign policy preferences. Domestic institutions can function as a filter for how domestic preferences are aggregated to influence decision makers, and they are the conduits through which domestic preferences are translated into policy. Variation in institutional rules can have a major impact on the foreign policy outcomes.

Domestic political institutions can be defined as "the traditions by which authority in a country is exercised" (Kaufmann & Kraay 2008). Institutions include an array of processes, including the procedures by which governments are selected, monitored, and replaced; the capacity of the government to effectively formulate and implement sound policies; and the level of respect of citizens and the state for the institutions that govern economic and social interactions among them Political institutions also relate to levels of voice and accountability, political stability and the absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption.

Domestic institutions form the structure through which the public's preferences and private industries' interests are translated into policy (Lake 2009). Good governance is important in orienting political leaders towards incorporating societal interests in their decision-making (Faust, 2008). For example, when deciding to join a preferential trade agreement (PTA), Mansfield and Milner (2012) show that regime type and the number of veto

players influences a leader's decision to join or not.[16] Democracies create more of an incentive to join PTAs than autocracies because PTAs impede the ability of autocracies to use patronage with protectionist policies. In democracies by contrast, joining a PTA can actually benefit leaders because PTAs act as a reassurance mechanism to the public that leadership will not cater to special interests Furthermore, the more veto players there are in either context, the less likely a leader is to join a PTA because more veto players result in an increasing number of political concessions leaders will need to make to gain ratification. In states with institutions that keep these costs low, leaders will elect to join PTAs (Mansfield & Milner 2012). When politicians are held accountable through domestic institutions, they are more likely to represent the interests within society rather than special interest groups, which tend to have preferences that diverge from the modal preferences of the larger population.

Domestic institutions are also the conduit through which disagreement between domestic constituencies is mediated and translated into international policy outcomes. Tracing the effects of domestic institutions on international cooperation efforts, Milner (1997) shows that divisions between branches of government make international cooperation less likely. Moreover, the balance of power across branches, which is set institutional rules (e.g., rules that give the legislature veto power or amendment power), affects the likelihood of international cooperation. Cooperation is more likely when the most powerful actor (legislature or executive) is more closely aligned with the state being negotiating with.

The institution of political parties can also act as the intermediary between societal preferences and foreign policy. For example, in the current liberal market system where capital

[16] Mansfield & Milner (2012) define a veto player as any actor that must approve of a policy other than the actor who put forth the policy.

is highly mobile and can be allocated almost anywhere around the globe, international economic policymakers can only control monetary policy or have a fixed exchange rate, but not both. This dilemma is called the unholy trinity (Cohen, 2000). Different groups in society have preferences about this choice (Frieden, 1991, Frieden, 2015). Bearce (2003) finds that these preferences correlate with different political parties. Societal groups such as labor who prefer sovereignty over monetary policy back parties on the left while, societal groups that prefer exchange rate stability, such as international business back right-leaning parties.

3.2 Domestic Interests and Institutions in Climate Aid Preference Formation

The above insights inform my theorization of the role that domestic interests and institutions play in climate aid preference formation. Climate aid is likely to have distributional impacts on actors within states, creating cleavages among sub-national actors. Various domestic groups are likely to attempt to influence donor preferences to get their interests reflected in their government's climate aid policy choices. The impacts of climate aid will be most acute for the energy sector with a cleavage within the sector between the fossil fuel industry and the renewable energy industry. The renewable energy industry is an emerging industry and climate aid will help broaden market opportunities for it (Lewis 2014). In contrast, the fossil fuel industry has driven the global economy since the industrial revolution and encouraging new energy sources is in direct conflict with its interests (Hess 2014). Thus, these two groups within the energy sector are expected to have divergent preferences over climate aid. The fossil fuel industry can be expected to oppose climate aid, while the renewable energy industry can be expected to support it.

It is important to consider both industries when trying to understand how the energy sector could have an impact on climate aid decisions because all donor states considered in this

dissertation have both these types of energy industries active within their state. Each state has their own unique energy profile. Some states have an expansive fossil fuel industry and relatively small renewable energy industry, some have a balance between the two, and some have the reverse. The energy makeup in each state is likely to have an impact on donor's climate aid preferences. This dissertation presents a theory for each industry's preferences over climate aid separately and then presents a theory that considers the relative potential of both industries within a state together where the ability to influence climate aid decisions will be mediated by the domestic institutional context in which these industries must navigate in their attempt to exert influence. When institutions are stronger, and the renewable energy industry has more relative potential than the fossil fuel industry, they will have more influence on climate aid policy. In contrast when institutions are weaker, the fossil fuel industry will have a greater ability to influence climate aid even if the renewable energy industry has more relative potential.

My hypotheses rest on the assumption that groups within the energy sector will attempt to influence their governments' climate aid decisions, but I do not assume that the preferences of each industry directly translate into policy. There is no way to directly measure the influence of each industry, especially because of limited data on lobbying efforts by industry in the countries considered in this dissertation. Rather the proportion of overseas development aid dedicated to climate projects reveals the national prioritization of climate relative to other aid objectives. The proportion of total aid dedicated to climate by each donor state is theorized as the donors' revealed preferences, and the best approximation that can be achieved of each industry's influence.

3.2a Hypothesis 1: Domestic Economic Interests of the Fossil Fuel Industry

The fossil fuel industry can be expected to be one of the clear losers if states come together to combat the causes of climate change. In contrast, the renewable energy sector is likely to be a clear winner. Interest groups care about foreign aid policy when it has distributional impacts for them (Milner & Tingley 2015). The fossil fuel industry can be expected to lose out because climate aid is used in part to support mitigation efforts. Successful mitigation is based on decreases in greenhouse gas emissions, and over 70% of the world's manmade greenhouse gas emission comes from the energy sector (Ritchie et al. 2020).

It is worth noting that not all climate aid is used solely for mitigation projects. For example, climate aid can be used for water management projects, biodiversity projects, and land degradation projects, to name a few. Pursuing a diverse set of projects will not cancel out the desire of the fossil fuel industry to limit funding for climate aid. Dryzek (2000) writes, "policies that damage business profitability—or are even perceived as likely to damage that profitability—are automatically punished" (pg. 142). Operating from this assumption, even if only part of climate aid directly impacts fossil fuel production and consumption, the industry is likely to oppose climate aid in general.

The degree to which the fossil fuel industry will be able to influence donor preferences will depend in part on its overall capacity and how important it is to a state's economy. By capacity I mean their ability to attempt to influence decision makers choices on climate aid. The more fossil fuels are consumed in a country, the more reliant national economies are on that form of energy. A larger fossil fuel industry is also likely to have the capacity/ability to put more resources into lobbying for its agenda, including anti-climate aid lobbying efforts (Moe 2010). There is extensive evidence that fossil fuel industries have exerted both structural

and instrumental power to oppose climate action in national and international arenas (Pulver and Benney 2013; Boasson et al. 2022). The combination of the assumption that the fossil fuel industry can be expected to oppose climate aid and their domestic power and capacity is the foundation for my first hypothesis.

> *H1: As current share of fossil fuel energy consumption (as a proportion of total energy consumption) increases in a state, the relative amount a donor will contribute to climate aid (as a proportion of total ODA) will decrease.*

3.2b Hypothesis 2: Domestic Economic Interests of the Renewable Energy Industry

In contrast to the fossil fuel industry, the renewable energy industry is likely to benefit from more climate aid. Any viable solution to climate change relies on a transformation of energy systems from fossil fuel to renewable energy supplies. The renewable energy industry should support all efforts to address climate change. The renewable energy industry can be expected to gain from increasing climate aid because a major goal of climate aid is to create sustainable energy in developing countries. Climate aid has the potential to open more markets in places that might be unable to afford renewable energy technology without foreign assistance.

The renewable energy industry includes multiple technologies. My focus is on solar photovoltaics (PV) and wind energy, which account for 86% of global renewable capacity and have been expanding at a steady rate prior to the COVID-19 pandemic (International Energy Agency 2020). Wind and solar are still new and emerging industries, so their capacity and economic importance in many states is unlikely to be comparable to that of the fossil fuel

industry (Burke & Stephens 2017). Instead, I argue the industry's ability to influence decision makers should be based on if it is likely to be a viable option for energy provision in the future. Renewable energy is likely to be the energy of the future, even if this industry does not yet have the economic or production capacity that the fossil fuels industry does (Brown 2009; Kabir et al. 2018). Furthermore, some states, Iceland for example, already rely almost entirely on renewable energy and other states such as Sweden and Costa Rica are following in their footsteps (International Energy Agency 2020). Even many states with expansive fossil fuel industries are also leading in renewable energy generation such as the U.S., China, and Brazil (International Energy Agency 2020).

The capacity of the renewable energy industry is not comparable on the same scale as the fossil fuel industry because it is an emerging industry and not an incumbent one. The capacity of the fossil fuel industry can be captured by how much each country consumes this type of energy. In contrast an emerging industry's capacity is better understood based on how much they produce that can contribute to the energy system within a country. Unlike fossil fuels, renewable energy is used primarily for electricity thus the degree to which it is able to influence a donor states climate aid decisions are likely to depend on how much electricity it is able to produce. The more electricity the renewable energy industry can produce, the more policymakers can be expected to see this industry as having the ability to be a major energy source in the future. If this is the case, one can expect that when the renewable energy industry produces more electricity, it could be expected to have more ability to influence policymakers and to get its interests reflected in climate aid policy. The combination of renewable energy interests in support of climate aid and the industry's ability to produce electricity is the foundation for my second hypothesis.

H2: As the current share of renewable electricity produced (as a proportion of total electricity produced) increases in a state, the amount a donor contributes to climate (as a proportion of total ODA) aid will increase.

3.2.c Hypothesis 3: Interactions of Domestic Economic Interests and Institutions

A combination of economic factors and political institutions within a country are likely to affect climate aid policy. All foreign policy will impact society in some ways. Research on climate aid allocation should not take domestic politics out of the equation. The energy sector is the part of society that the allocation of climate aid is most likely to impact. Considering this, I expect these economic actors to be most active in attempting to influence how much their government allocates to climate aid. When the fossil fuel industry has a high share of energy production or if the renewable energy industry has high potential, they will be more capable of and more successful in influencing climate aid levels. The divergent preferences between economic winners and losers of climate aid should be considered regarding which interests will be best able to influence donor's climate aid preferences. Domestic institutions, however, are likely to be a mediating factor in how competing factions in the energy sector will have influence on government climate aid prioritization. In the climate aid literature, many studies suggest that recipients with good governance or democratic characteristics are more likely to receive aid and that this aid will be more effective (Hicks et al. 2008; Halimanjaya 2015; Robinson & Dornan 2015; Weiler et al. 2018). I argue that these types of institutional traits should also be taken into account for donors. States with better governance are more likely to appropriately reflect the interests of their constituents.

Both the fossil fuel and renewable energy industries would be considered special interests. However, research shows that overall preferences of the public align more with the renewable energy industry's interests than with that of the fossil fuel industry. In 2017, a cross-national survey of 13 countries finds that 82% of respondents believe it is important to create a world fully powered by renewable energy (Orsted 2017)[17]. If we accept this assumption, then the interests of society at large align more with renewable energy interests than fossil fuel interests. Where there is good governance or strong democratic institutions, one can expect that the interests of the renewable energy industry representing the broad interests of society will be more likely to be translated into policy preferences. In contrast, the fossil fuel industry represents narrow interests which are more likely to be translated into policy preferences where there is poorer governance.

We also need to consider the clear power disparities between the fossil fuel and the renewable energy industries. The type of domestic institutions in a state may condition how much these power disparities matter. The fossil fuel industry is more powerful in many ways, but two ways of which are most important to mention in this regard. First, the fossil fuel industry is more established in state economies and political systems. They have the advantage of incumbency, which has allowed them to develop relationships with political parties, political operatives and build the modern economy (Curran 2020). The Center for Responsive Politics tracks U.S. campaign contributions and shows that over time the fossil fuel industry has donated increasing amounts to U.S. political campaigns. While data on contributions is limited, the renewable energy industry contributed only a fraction of what the fossil fuel industry did

[17] Countries surveyed include Canada, U.S., U.K., Denmark, Netherlands, France, Germany, Poland, Sweden, China, South Korea, Taiwan, and Japan.

in 2020 (Center for Responsive Politics 2020). Second, and linked to the previous point, the fossil fuel industry overall has more material resources. The asymmetrical power advantage of the fossil fuel industry does not necessarily make its influence on state preferences a foregone conclusion. While taking into account these two advantages of the fossil fuel industry, ultimately, it is domestic institutions that will determine the level of influence that each industry will be able to have in determining the amount of climate aid.

The influence of the fossil fuel and renewable energy industries is likely to depend on their relative capabilities and on domestic institutions in each state. I operationalize relative capabilities as relative potential, that is, the degree to which either industry has the potential to be a major provider of energy and economic profit for the state. Relative potential will be the comparative growth rate of each industry over time. Growth rate will be the percent increase of each type of energy consumed within that state from one year to the next. The comparative aspect means that we must consider the growth rate of each industry in comparison to the other. Specifically, is renewable energy being produced at an increasingly higher rate than fossil fuels are being consumed? The domestic institutional context will likely determine if relative potential is reflected in the amount of climate aid allocated, given each industry's interests.

I expect that in states with better governance, governments will be more likely to be responsive to the interests of the emerging renewable energy industry when they have higher relative potential than the fossil fuel industry. In terms of relative potential, if the renewable energy industry is growing at a faster rate than the fossil fuel industry then in a state with good governance, the salience of the renewable energy industry's interests can be expected to be taken into account by decision makers. When governments are effective and legitimate, they can be expected to be less likely to prioritize the narrow interests of the old and powerful and

more likely to give voice to new and emerging industries, if these new emerging industries look likely to be successful. In contrast, I expect states with lower governance scores to be less likely to incorporate relative potential into their decision making. In a state with poorer governance, the incumbency of the fossil fuel industry is more likely to have an enduring influence regardless of the relative potential of the renewable energy industry. States with poor governance are less likely to be responsive to society and societal changes. Furthermore, lower governance is likely to be associated with rent collecting, and a lower likelihood of shifting away from the status quo system. This leads to my third hypothesis.

> *H3: The impact of the relative potential of the renewable energy industry compared to the fossil fuel industry on a donor's contributions to climate aid (as a proportion of total ODA) will increase as the quality of governance increases.*

3.3 Theory Conclusion

The transformative nature of climate aid means it will be of interest to segments of the energy industry in donor states. Analyses attempting to understand the climate aid choices of donor states must take into account the influence of domestic fossil fuel and renewable energy industries. The fossil fuel industry can be expected to lobby to maintain the status quo and discourage climate aid. In contrast the renewable energy industry can be expected to lobby in support of climate aid because it is likely to give their industry more opportunities to expand their markets into developing countries who will have more funds available to transition their energy sector to be more sustainable. Each of these industries is likely to attempt to influence state decisions on how much to allocate to climate aid. In addition, each of these industries will

be more or less likely to be effective in their attempts to influence their states policy choices depending on the institutional context in which they are operating and their relative potential to provide energy to their state in the future. When the renewable energy industry is operating in a country with strong democratic institutions and they are growing at a higher rate compared to the fossil fuel industry, it is likely their preferences about climate aid will be reflected in policy choices of that donor state. In contrast, when a state has weak democratic institutions, even when the renewable energy industry has more relative potential than the fossil fuel industry, that state is still more likely to reflect the interests of the entrenched fossil fuel industry.

The theory proposed in this dissertation is intended to emphasize how domestic economic interests and domestic political institutions are crucial for understanding donor states' climate aid decisions. As with many other topics in international relations, it is necessary to open the black box of states and consider how choices in the international sphere not only impact reflects a state's position within the hierarchy of other states but also interests within that state itself and the ways domestic instructions aggregate and mediate across competing interests.

4. Data and Methods

This chapter introduces the data used in the dissertation, explains the data sources for each of the main variables, shows how each variable was constructed and documents trends within the data. The first section focuses on explaining the dependent variable--proportionate climate aid--and presenting descriptive statistics for the dependent variable across countries in the sample. The discussion of the dependent variable will also show climate aid trends for countries over time. The following sections discuss the main independent variables—fossil fuel energy consumption and renewable electricity production—and the interaction term between their relative potential and governance scores. These sections also include descriptive statistics for each independent variable for each country in the sample and show trends of these variables in each country over time. The next section discusses important control variables that account for additional factors likely to influence climate aid. Finally, the chapter concludes by introducing the general modeling approach used in the dissertation.

4.1 Research Sample

The sample for this dissertation includes 28 of 38 OECD countries that have contributed climate aid from the years 2002-2015.[18] In the appendix, figures A.1 and A.2 show the average GDP per capita of all OECD countries in 2002 and 2015. Data on GDP per capita comes from the OECD. Countries included in my analysis are highlighted in light grey while excluded OECD countries are in purple. These figures reveal how OECD countries that give

[18] The OECD countries not included in this sample are Chile, Columbia, Costa Rica, Estonia, Hungary, Israel, Latvia, Lithuania, Mexico and Turkey. These countries are not included because they do not consistently contribute to climate aid. This is likely due to the fact that they are smaller economies and are not annex II countries.

climate aid tend to be above average GDP, which aligns with the fact that climate aid requires financial resources and thus is unlikely to come from poorer countries. Of the countries that do not provide aid, they tend to be smaller economies that have historically emitted less CO2 than contributing countries. In the appendix figure A.3 shows the total CO2 emissions of all OECD countries from 1990-2015. Data on CO2 emissions comes from the World Bank. All non-contributing OECD members fall below the average CO2 emissions of all OECD countries, except Mexico. Figure A.3 is simply used to illustrate the different historic responsibility of the countries in the sample compared to those who are not.

My empirical analysis focuses on climate aid distributions during the period of 2002-2015. I limit the sample in this way for two primary reasons. First, the Kyoto Protocol heavily influences the provision of climate aid, and so I start my analysis after it was clear that the agreement would enter into force. The Kyoto Protocol was the 1997 follow up agreement to the 1992 United National Framework Convention on Climate Change (UNFCCC) and was the first environmental treaty that had binding requirements on developed states to meet emissions reductions targets. Although the Kyoto Protocol did not formally enter into force until 2005, in 2001 Russia announced it would ratify the Kyoto Protocol, allowing the agreement to enter into force even without US participation. Thus, 2002 marks the beginning of ongoing international efforts to address climate change. Second, I end my sample in 2015 because this is the year when countries came together to sign the Paris Climate Accords, which also influences climate financing. During negotiation of the Paris Climate Accords, climate finance was an important and controversial topic (Clemencon 2016), likely shifting the climate finance landscape and changing the dynamics influencing climate aid.

4.2 DV: Proportion of ODA Dedicated to Climate Aid

Climate aid is categorized as a type of Official Development Assistance (ODA). In a 1970 resolution, the United Nations General Assembly specified that rich countries should aim to give 0.7% of their GNP to poor countries in the form of ODA (Qian 2015). In 1992, the Rio Markers were created to define climate aid and enable donors to categorize ODA appropriately when allocated towards environmental projects. These markers defined climate aid as financial resources transferred to other countries to assist in projects which preserve biodiversity, reduce desertification, and projects which enable climate mitigation (Michaelowa & Michaelowa, 2011). In 2010, markers were also included for projects aimed towards adaptation that will help countries adapt to the negative impacts of climate change (Dolsak & Prakash, 2018).

The climate aid literature is split on how to measure climate aid, but I follow Halimanjaya & Papyrakis (2015) and operationalize climate aid as a proportion of ODA. Some studies operationalize climate aid in absolute amounts of aid contributed (Figaj 2010; Robinson & Dornan 2017). This is problematic because contributions measured in absolute amounts do not consider the great variation in GDP across donors. Some states, such as the United States, simply have more resources to contribute to climate aid and thus its absolute contributions are non-comparable to smaller countries such as Iceland or Norway. Klock et al. (2018) operationalizes climate aid per capita, which controls for size of a country to some extent but still does not account for countries that are prone to giving more aid than others. Finally, some studies operationalize climate aid as a proportion of GDP per capita (Weiler et al. 2018; Peterson 2022). Doing so solves the comparability issue of using absolute amounts of aid but also does not take into account that some countries might be more prone to giving foreign aid

in general. Making climate aid a proportion of ODA allows for my dependent variable to be comparable across countries.

Another way my dependent variable diverges from existing approaches is that it encompasses all climate aid rather than focusing exclusively on aid for mitigation and adaptation. The Rio Markers identify five possible categories of climate aid: Mitigation, adaptation, biodiversity, desertification and environmental. Mitigation aid is aimed at projects that help countries reduce their emissions and/or protect or enhance greenhouse gas sinks. Adaptation aid is aimed at projects intended to help countries reduce their vulnerabilities to the impacts of climate change now or in the future. Aid aimed at biodiversity is intended to maintain protection of ecosystems. Desertification aid is aimed towards projects that reduce land degradation. And finally environmental aid is for projects that do not clearly fall into the other four categories. Many other studies exclude the latter three types of climate aid (e.g., Ayers & Huq 2009, Halimanjaya and Papyrakis 2015, Klock et al. 2018, Bayramoglu et al. 2022, Peterson 2022). I include all five types of climate aid because climate aid across the five categories is interconnected and fungible. For the energy sector it would be challenging to separate distinct lobbying strategies for the different types of climate aid. Rather, these industries are more likely to be in support or against the whole bundle, not just one or two specific types. Perhaps most importantly, I believe including all types of climate aid is the most prudent approach because it is donors themselves that decide how to categorize their contributions and there is little-to-no oversight of this process (Michaelowa & Michaelowa 2011; Weikmans & Roberts 2019). For these reasons I go against the common practice in the literature that focuses on mitigation and/or adaptation aid only and include all five types of climate aid when constructing my dependent variable.

The dependent variable for all models in this dissertation is the yearly contributions of aggregate bilateral climate aid by each country each year as a proportion of all bilateral official development assistance (ODA) contributions given by each country each year.

$$\textit{Proportional Climate Aid} = \frac{\textit{Yearly Climate Aid Contributions Principle and Significant (USD)}}{\textit{Total Yearly Bilateral Development Aid Contributions (USD)}}$$

I operationalize my dependent variable in this way for two reasons. First, my measure of climate aid is a proportion of ODA because it accounts for the fact that some countries might be more prone to giving ODA in general. Moreover, my focus is on the relative prioritization of climate aid as a form of ODA. ODA budgets are somewhat stable in countries overtime, but what goals they target is more subject to change. If the proportion of ODA allocated to climate-oriented goals increases this would suggest that the donor state in question is putting a higher priority on climate-related issues. Second, I focus on climate aid as a proportion of ODA exclusively rather than including all forms of bilateral foreign aid. ODA is the most widely used indicator of foreign aid flows in the literature and by international organizations. There is a close relationship between development aid and climate aid, and studies show that donors see these types of aid as either inherently interlinked or at least compatible (Ayers & Huq 2009; Ardnt & Tarp 2017). Other types of foreign aid, such as humanitarian assistance or conflict reduction aid, are not as closely connected to climate aid. Humanitarian assistance for natural disasters or aid to reduce conflict are specific to events in the international arena and fluctuate based on such events. Humanitarian aid is given to countries to help them recover from a natural disaster. Military aid is intended to help a side defeat an opponent or increase their ability to find a peace deal.

I used multiple data sources to create this variable. For yearly contributions to development aid, I used the OECD Credit Reporting System (CRS) for ODA dataset. For

yearly climate aid contributions, I used the OECD CRS Aid Targeting Global Environmental Objectives dataset[19]. Both datasets have recorded aid allocations from 2002-2015. These two datasets are comparable because they both use the OECD definition of ODA. For the climate aid data, I use two categories of climate aid, principle and significant, and exclude two others, screened and not targeted and not screened. Aid that is labeled as principle and significant has as its main purpose addressing environmental issues.[20] Screened and not targeted aid or aid that is not screened is not explicitly intended for environmental purposes. The OECD has coded these categories of climate aid based on the 1992 Rio Markers which is the widely agreed upon measure of what constitutes climate aid. The Rio Markers outline five categories of climate aid, biodiversity aid, mitigation aid, adaptation aid, desertification aid, and environmental aid. My measure of climate aid is an additive of these five types of climate aid.

The DV data indicate that average contribution of all countries to climate aid as proportion of ODA is 0.95%, meaning that over this time period, climate aid has been on average less than 1% of all Official Development Assistance (ODA) for each country each

[19] The CRS dataset includes all Annex II countries, which are countries required to provide financial assistance to developing counties to "enable developing countries to undertake emissions reduction activities under the Convention and to help them adapt to adverse effects of climate change" (UNFCCC). In addition, the CRS dataset includes non-Annex II countries such as Korea, Czech Republic, Slovenia, Slovakia and Poland who have voluntarily began contributing to climate finance in the latter years of the sample. It can be assumed that this dataset covers a large portion of all climate aid provided during this time period because it includes all Annex II countries. There is not reliable data on all climate finance because countries outside the CRS reporting system are not required to report their aid to any international organization. It is likely that for example, China is providing climate finance, but there is not systematic measurement or reporting system to track this aid.

[20] The OECD defines principal aid as "an activity can be marked as principal when the objective (climate change mitigation or adaptation) is explicitly stated as fundamental in the design of, or the motivation for, the activity." The OECD defines significant aid as "an activity can be marked as significant when the objective (climate change mitigation or adaptation) is explicitly stated but it is not the fundamental driver or motivation for undertaking it. Instead, the activity has other prime objectives, but it has been formulated or adjusted to help meet the relevant climate concerns." The OECD defines not targeted as "the activity was examined but found not to target the objective (climate change mitigation or adaptation) in any significant way".

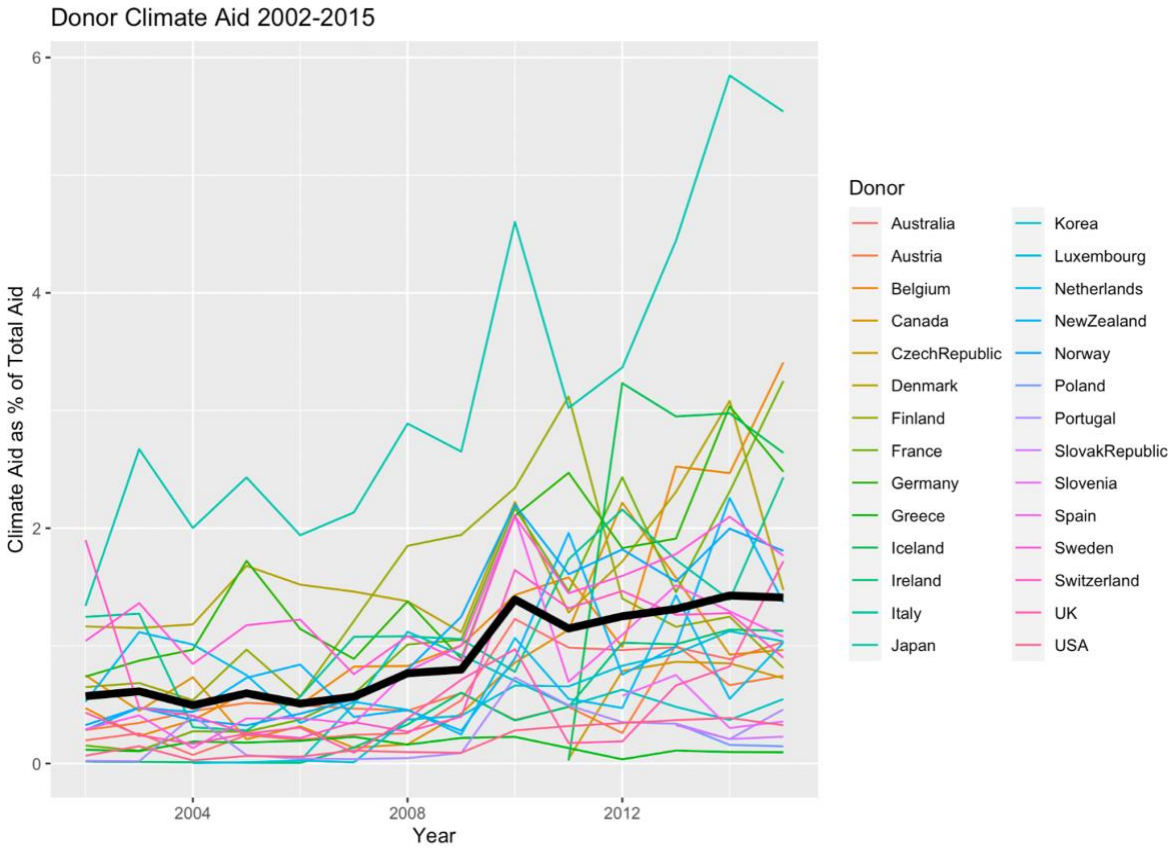
year on average. The top contributors on average are Japan (3.2%) and Iceland (2.36%), while the lowest contributors on average are Greece (0.15%) and the United States (0.19%). Table 1 includes each country in the sample, their average climate aid contributions, their minimum contribution, their maximum contribution, and the years they have allocated climate aid. In the appendix figure A.4 shows the average climate aid contributions from each country from 2002-2015 as a percentage of ODA and shows donors in descending order from donors who have contributed the most, to those who have contributed the least. Also in the appendix, figure A.5 shows the average amount of climate aid contributions per county but in absolute numbers. Figure A.4 is an interesting comparison to Figure A.5 because we see that for example the United States is the second to lowest contributor of climate aid as a percentage of ODA yearly on average, but the third largest contributor in absolute amounts, while Japan maintains the top rank in absolute amounts and as a proportion of their yearly ODA on average. Figure A.4 and figure A.5 are further evidence for why this analysis measures climate aid as a proportion of ODA and not in absolute numbers. Choosing to measure climate aid for each country as a yearly proportion of each country's ODA controls for confounding factors such as GDP and the simple fact that some countries might generally more inclined to provide foreign aid. The key consideration for this dissertation is how much of the aid given by countries is targeted towards environmental goals. Figure 1 shows country trends overtime and includes an overall average trend line for all country contributions. Average contributions to climate aid have slowly increased over time from 0.28% of ODA in 2002 to about 1.88% of all ODA in 2010 and remained steady since.

Table 1.

Climate Aid Donor Countries (% of ODA) Average, Minimum, Maximum and Duration

Donor Country	Average Climate Aid (% of ODA)	Climate Aid Min (% of ODA)	Climate Aid Max (% of ODA)	Years
Australia	0.58	0.07	1.23	2002-2015
Austria	0.51	0.26	1.01	2002-2015
Belgium	1.23	0.23	3.41	2002-2015
Canada	0.78	0.13	2.22	2002-2015
Czech Republic	0.79	0.04	0.86	2011-2015
Denmark	1.62	1.12	3.08	2002-2015
Finland	1.32	0.54	3.12	2002-2015
France	1.21	0.11	3.25	2002-2015
Germany	1.60	0.74	3.04	2002-2015
Greece	0.15	0.04	0.23	2002-2015
Iceland	2.36	0.02	3.23	2011-2015
Ireland	0.45	0.005	1.14	2002-2015
Italy	1.22	0.28	2.43	2002-2015
Japan	3.20	1.34	5.85	2002-2015
Korea	0.58	0.02	1.12	2006-2015
Luxembourg	0.51	0.003	1.12	2002-2015
Netherlands	0.71	0.25	1.43	2002-2015
New Zealand	0.87	0.28	2.26	2002-2015
Norway	1.11	0.32	2.20	2002-2015
Poland	0.21	0.15	0.34	2013-2015
Portugal	0.24	0.02	0.73	2002-2015
Slovak Republic	0.25	0.21	0.33	2013-2015
Slovenia	0.50	0.30	0.75	2010-2015
Spain	0.82	0.13	2.11	2002-2015
Sweden	1.37	0.76	2.10	2002-2015
Switzerland	0.87	0.22	1.90	2002-2015
United Kingdom	0.51	0.09	1.72	2002-2015
United States	0.19	0.03	0.39	2002-2015
Averages	0.95	0.28	1.88	

Figure 1.



Finally, figures A.6 and A.7 in the appendix show the types of climate aid each country in the sample contributes on average. Figure A.6 shows what percentage of all climate aid that is contributed by each subcategory of climate aid on average. Most countries categorize much of the aid they contribute as environmental which is aid is for projects that do not clearly fall into the other four categories (mitigation, adaptation, biodiversity and desertification). Most countries categorize about 50% of their climate aid as environment. At only 25%, Australia has the lowest average percentage of aid categorized as environmental and at almost 70%, New Zealand has the highest average percent of aid categorized as environmental. Figure A.7 shows this breakdown of aid types as a proportion of each country's total climate aid.

4.3 IV 1: Fossil Fuel Energy Consumption

The degree to which the fossil fuel industry will be able to influence donor preferences will depend in part on its overall capacity and how important it is to a state's economy. I operationalize the influence of the fossil fuel industry as fossil fuel energy consumption from oil, gas and coal sources as a percent of the total energy consumption in each country for each year of my sample. When the fossil fuel industry produces a large share of all the energy consumed in a state it is likely to have more influence over the state's climate aid preferences. Data for this variable was gathered from the World Banks World Development Indicators.

Table 2 shows the average fossil fuel energy consumption for each country in the sample, as well as the minimum and maximum for each country. The average fossil fuel consumption of all countries between 2002-2015 is 72.48% of all energy consumption. The highest on average consumers of fossil fuels are Australia (94.03%), The Netherlands (92.79%), Greece (91.04%) and Poland (90.04%). The lowest average fossil fuel consumer by far is Iceland (10.64%) followed by Sweden (32.72%). Table A.1 in the appendix shows descriptive statistics for fossil fuel energy consumption for the whole sample. Figure A.8 in the appendix shows the annual average fossil fuel consumption for each country organized from highest consumers to lowest and figure A.9 is a correlation plot between average annual climate aid and average annual fossil fuel consumption for each country. Figure 2 shows country trends of fossil fuel consumption over time, which overall shows a slight downward trend for most countries over time. Australia is an interesting example of fossil fuel consumption over time because their consumption has stayed almost the same from 2002-2015. Australia reports that over three quarter of their domestic electricity comes from coal, one of the dirtier energy sources, and their transportation sector also relies heavily on fossil fuels

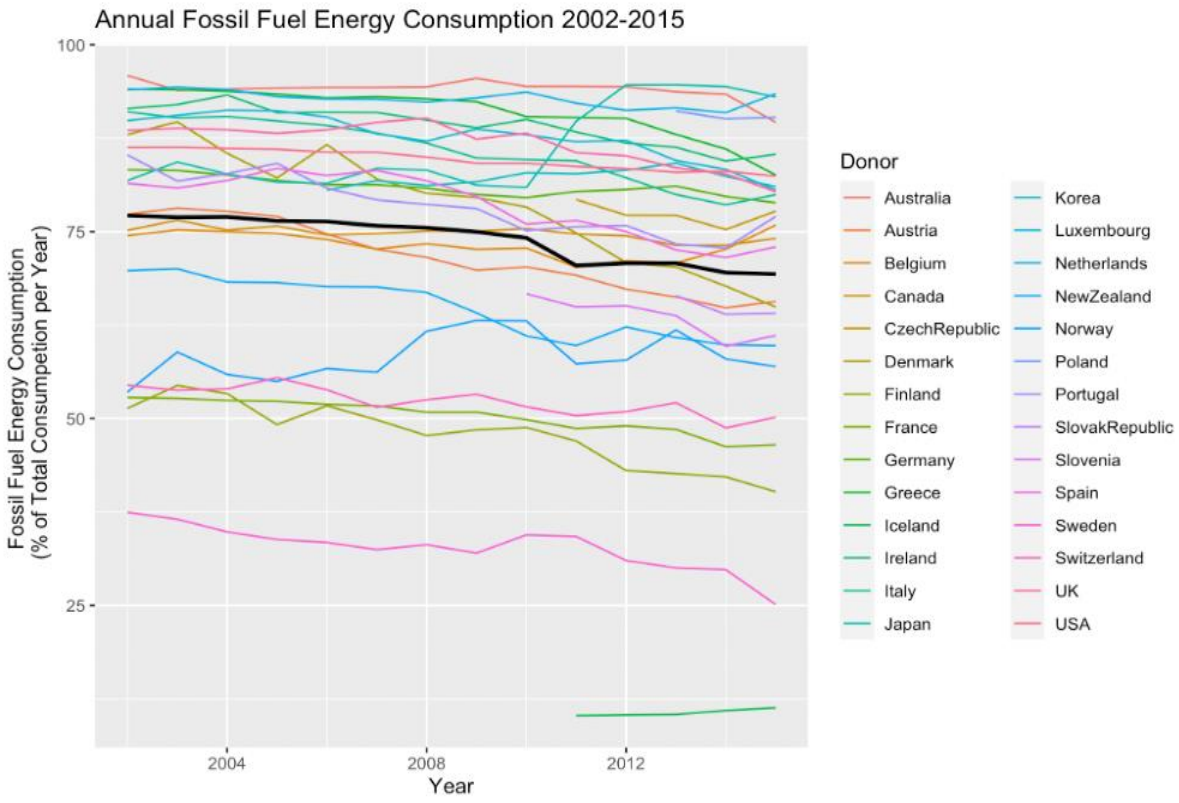
(GAAU 2022). Furthermore, Australia is a major coal producer having large deposits throughout the country.

Table 2.

Descriptive Statistics: Fossil Fuel Energy Consumption by Country

Donor Country	Average Fossil Fuel Consumption	Fossil Fuel Consumption Minimum	Fossil Fuel Consumption Maximum
Australia	94.03	89.63	95.89
Austria	71.60	64.81	78.14
Belgium	73.26	70.25	75.87
Canada	74.79	73.17	76.55
Czech Republic	77.34	75.28	79.26
Denmark	78.61	64.93	89.68
Finland	47.85	40.21	54.42
France	50.31	46.23	54.81
Germany	81.03	78.86	83.28
Greece	91.04	82.57	94.07
Iceland	10.64	10.25	11.29
Ireland	89.26	84.44	93.28
Italy	84.74	78.59	91.04
Japan	86.23	80.91	94.63
Korea	82.16	80.55	84.16
Luxembourg	87.47	80.56	91.26
Netherlands	92.79	90.92	94.33
New Zealand	64.71	59.75	70.02
Norway	58.28	53.53	63.11
Poland	90.51	90.09	91.15
Portugal	78.61	72.81	85.26
Slovak Republic	64.82	63.95	66.42
Slovenia	64.34	59.66	66.42
Spain	78.52	71.53	83.47
Sweden	32.72	25.12	37.45
Switzerland	52.33	48.74	55.46
United Kingdom	86.81	80.35	90.18
United States	84.63	82.43	86.28
Averages	72.48	67.86	76.33

Figure 2.



In the appendix figures A.10 and A.11 shows countries in the sample that are historically higher consumers and lower consumers of fossil fuels respectively. High consumers were defined as any country with greater than 85% fossil fuel energy consumption on average between 2002-2015 because the third quartile in this sample is 86.85%. Apart from Australia and the Netherlands, many of these higher fossil fuel consumers are decreasing their fossil fuel consumption over this time period while the Australia and the Netherlands have remained somewhat continuous in their trends. Low consumers were defined as any country with less than 65% fossil fuel energy consumption on average because the first quartile in the sample is 63.98%. Similar to high fossil fuel consumers, the general trend across these countries is a slight overall decline in fossil fuel consumption over the time period. Norway is the exception to this trend with a very slight increase of fossil fuel consumption.

4.4 IV 2: Renewable Electricity Production

The second independent variable estimates the influence of the domestic renewable energy industry on donor state climate aid preferences. The variable is operationalized as renewable electricity production (excluding hydro power)[21] in each country for each year of my sample. I use renewable electricity production instead of renewable energy consumption because renewable electricity production is a better measure of the potential contribution of renewable energy to be the main source of energy for a country, whereas renewable energy consumption would measure the populations willingness to use renewable energy. To create the second independent variable for this dissertation, I use data from the World Banks' World Development Indicators.

Table 3 shows the average renewable electricity production for each country in the sample, as well as the minimum and maximum for each country. The highest on average producer of renewable electricity is Denmark (33.87%) and Iceland (28.95). The lowest on average producer of renewable electricity is Korea (0.61%) and Norway (1.03%). Table A.2 in the appendix shows descriptive statistics for renewable electricity production for the whole sample figure A.12 is a correlation plot between average annual climate aid and average annual renewable electricity production for each country. Figure A.13 in the appendix shows the annual renewable electricity production of all countries ranked from highest on average to lowest on average. Figure 3 shows individual country trends over time and overall shows a generally positive trend of increasing amount of renewable electricity production over time. Denmark is an interesting case because it is far outstripping other countries in increasing its

[21] It is important to exclude hydro power when assessing the potential of renewable energy because most hydro power is not new and has been present in these OECD states for decades.

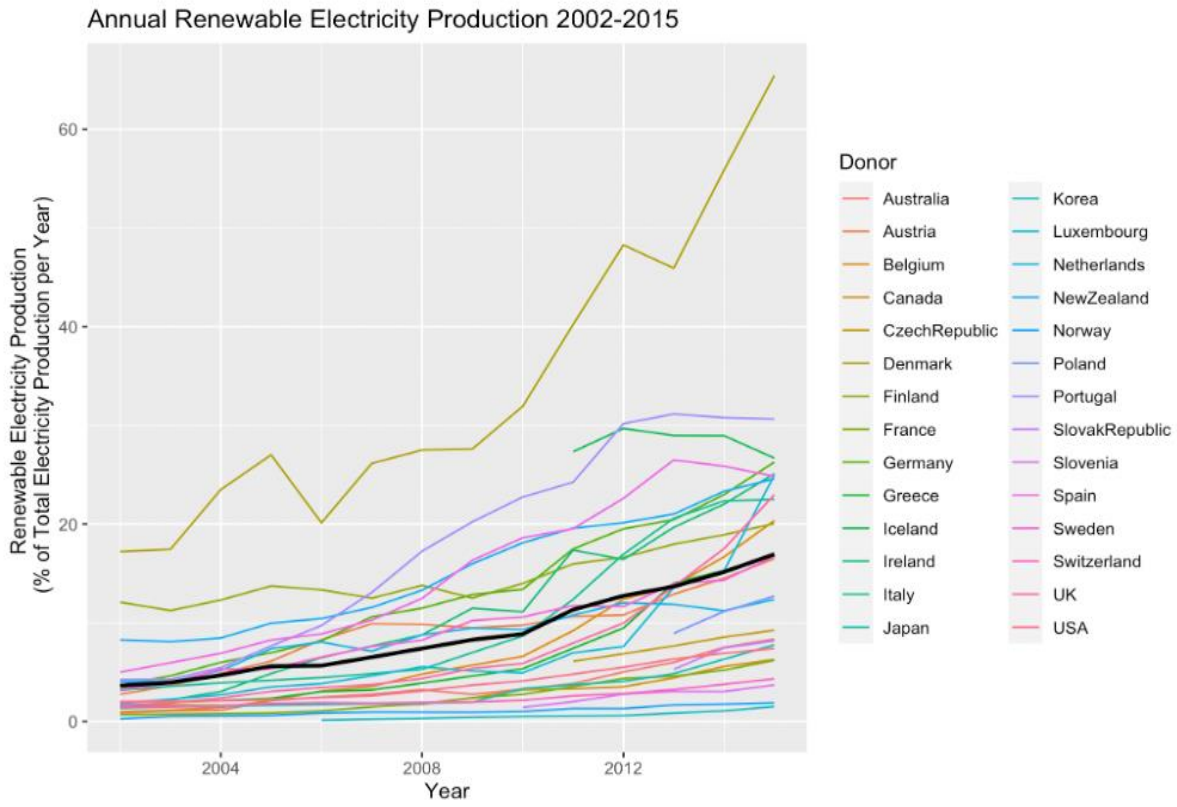
renewable electricity production over time. In 2002 renewable electricity was 20% of all electricity produced and by 2015 this increased to almost 66%. The fact that Denmark is not well suited for hydro power is likely the reason for their exceptional growth in renewable electricity over this time period. Unlike countries such as Norway and Iceland that have extensive hydro power infrastructure and have for many decades, Denmark has improved new renewable technologies as they came available during this time.

Table 3.

Descriptive Statistics: Renewable Electricity Production (% of total electricity Production)

Donor Country	Renewable Electricity Production average	Renewable Electricity Production Minimum	Renewable Electricity Production maximum
Australia	3.59	0.88	8.34
Austria	9.27	2.75	16.50
Belgium	7.26	0.96	20.34
Canada	2.90	1.57	6.27
Czech Republic	7.67	6.09	9.23
Denmark	33.87	17.20	64.44
Finland	14.64	11.23	20.05
France	2.59	0.69	6.20
Germany	13.17	3.67	26.27
Greece	6.42	1.44	16.89
Iceland	28.95	26.67	29.68
Ireland	11.28	1.90	25.10
Italy	9.98	3.17	22.51
Japan	3.09	1.33	7.76
Korea	0.61	0.14	1.50
Luxembourg	7.72	1.82	24.94
Netherlands	8.67	4.02	12.36
New Zealand	15.19	1.07	24.58
Norway	1.03	0.25	1.88
Poland	10.92	8.92	12.69
Portugal	17.97	4.23	31.15
Slovak Republic	6.96	5.28	8.16
Slovenia	2.66	1.42	3.69
Spain	15.13	4.98	26.48
Sweden	9.23	3.26	16.75
Switzerland	2.34	1.43	4.32
United Kingdom	7.406	1.65	22.97
United States	3.94	2.01	7.39
Averages	9.44	4.29	17.09

Figure 3.



In the appendix figures A.14 and A.15 shows countries in the sample that are historically higher and lower producers of renewable electricity respectively. High producers were defined as any country with greater than 12% average renewable electricity production because the third quartile for the sample is 12.88%. All high producing countries, except Iceland, have a very clear positive trend of increasing their renewable electricity production over time. Low producers were defined as any country with less than about 3% average renewable electricity production because the first quartile for the sample is 2.62%. Similar to high renewable electricity producers, low producers have also a trend of increasing their renewable electricity production over the time period.

4.5 Concept Operationalization Limitations for Hypothesis 1 and 2

My hypotheses focus on how the fossil fuel and renewable energy industries influence climate aid. Unfortunately, due to data challenges, I cannot operationalize influence directly and instead must use proxy variables based on observable implications. The operationalization of the independent variables for each industry's influence reflects a limitation of this study. This is unavoidable for one main reason: data on actual lobbying activities around the world are very limited. Only 22 countries have laws to regulate lobbying activities, and of these countries, clear reporting on who is lobbying and how much they spend on doing so is scarce (Sunlight Foundation 2016). In addition, out of these 22 countries, only half are OECD climate aid donors. Therefore, I use measures to gauge possible influence with a theory of influence grounded in the literature. As discussed in the previous chapter, each of my independent variables is oriented around the size, capacity or potential of the fossil fuel and renewable energy industries as an approximation of influence.

This limitation is likely to bias my findings because production renewable electricity production and consumption of fossil fuels is not likely to translate directly into influence. The systems that govern lobbying and industry influence is more complex and varies across countries. For example, Scruggs (2003) argues that how interest groups are organized in a country has impacts on environmental policymaking finding that countries with more corporatist institutions have better environmental performance than countries with more pluralist arrangements. Corporatist societies tend to make polices based more consensus rather than the interest group competition we see in pluralist countries (Scruggs 2003). Depending on the lobbying system in place in a country, industry influence on climate aid could be greater or less than my proxy measure accounts for. Thus, while these measures of industry power

work towards opening the black box of states, they do not full unpack the dynamics occurring within states.

4.6 IV 3: Interaction between Relative Potential and Governance

My third hypothesis investigates the interaction between the relative potential of the renewable energy industry compared to the fossil fuel industry and the quality of domestic institutional environments. I hypothesize that states with better governance are more likely to reflect the general public interest. Specifically, I expect that in states with better governance, the difference in relative potential between the renewable energy industry and the fossil fuel industry will have a positive effect on climate aid prioritization.

The relative potential variable is based upon the difference in percent growth of each type of energy consumed in each country each year. I use the percent growth of each type of energy consumption for two reasons. First, this allows for the variables to be comparable because they are measuring the same thing for different types of energy, consumption. Second, it is best to compare these industries based on consumption rather than electricity production because only a fraction of fossil fuel goes to producing electricity, instead a large portion of fossil fuels are used in the transportation for example. Thus, using fossil fuel electricity production would only capture a fraction of the dependency a country may have on fossil fuels. To construct this variable, I calculated the percent change in energy consumption in each country for each year for renewable energy consumption and fossil fuel energy consumption. Percent growth takes renewable energy consumption in 2003, subtracts renewable energy consumption in 2002 and then divides that sum by the renewable energy consumption in 2002 to create the percentage change for that industry in that country for that year. Figure 4 shows the percent growth in renewable energy consumption for each country over time and figure 5

shows the percent change in fossil fuel energy consumptions for each country over time. The only clear consistent pattern for renewable energy consumption percent growth is that it is on average consistently above zero, meaning renewable energy consumption is increasing each year on average prior to the previous year. In contrast, fossil fuel energy consumption percent growth is almost always below or at zero (except 2003). This indicated that on average fossil fuel energy consumption is declining from one year to the next or at a minimum, staying the same.

Figure 4.

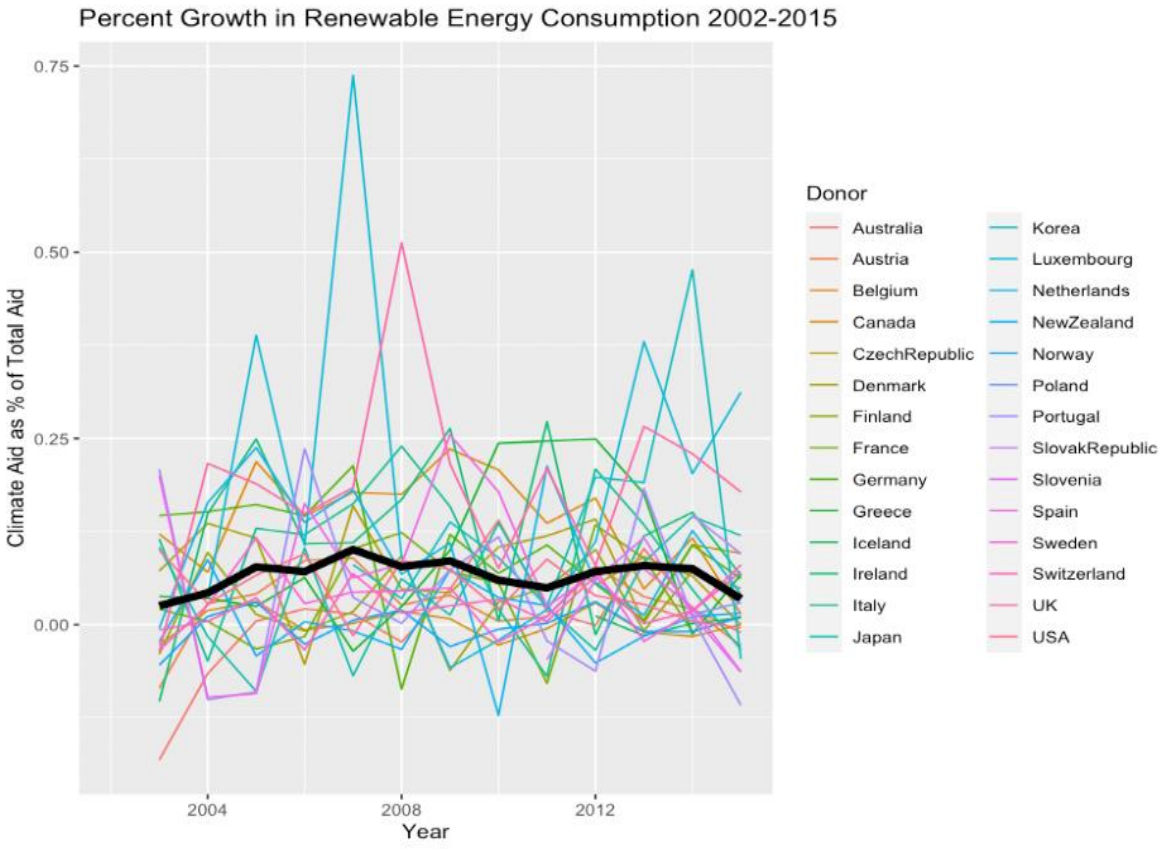
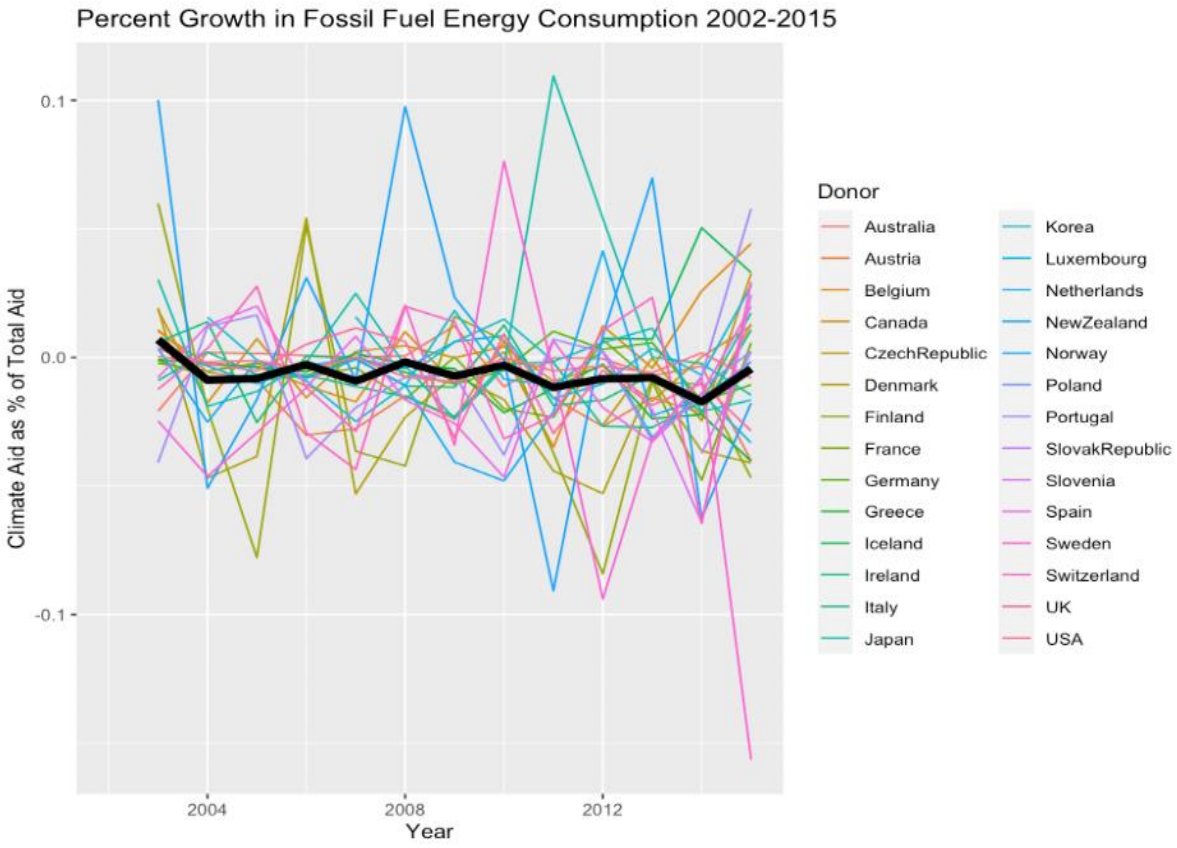


Figure 5.



To create a variable that represents relative potential I subtract the percent change of fossil fuel consumption from the percent change in renewable energy consumption. This results in comparative percent growth of the two industries in each country each year or relative potential. I subtract the percent change of fossil fuel consumption from the percent change of renewable energy consumption because in most countries the renewable energy consumption has increased more each year than fossil fuel consumption. Subtracting fossil fuel percent change from renewable percent change results in mostly positive numbers for the final relative potential for each year, which makes interpretation of the results simpler. The full equation for relative potential is below.

$$\text{Relative Potential} = \left(\frac{\text{Renewable Consumption } t_{i2} - t_{i1}}{\textit{Rewneable Consumption } t_{i1}}\right) - \left(\frac{\text{Fossil Fuel Consumption } t_{i2} - t_{i1}}{\textit{Fossil Fuel Consumption } t_{i1}}\right)$$

In table 4 the average relative potential for each country over the time period is shown, as well as each country's minimum and maximum of relative potential. Luxemburg and the UK have the highest relative potential on average by far with each having and average 20% percent growth. The countries with the lowest potential growth are Iceland (-2%) and Norway (-0.8%), both of which have a negative percent growth. The negative and/or very low relative potential for Iceland and Norway are to be expected because both have expansive renewable energy industries for much longer than the other countries in the sample both having relied on hydro power for decades (IEA). Figure A.14 in the appendix shows average annual relative potential of all the countries in the sample and figure A.17 is a correlation plot between average annual climate aid and average relative potential for each country. Figure 6 shows how relative potential has changed in each country from 2002-2015. Interestingly, unlike all the other variables used in this dissertation, relative potential does not have a clear time trend. Each country has years where it peaks and years where it decreases. Luxembourg and the UK each have years where they peak in relative potential well above the rest in 2007 and 2008 respectively.

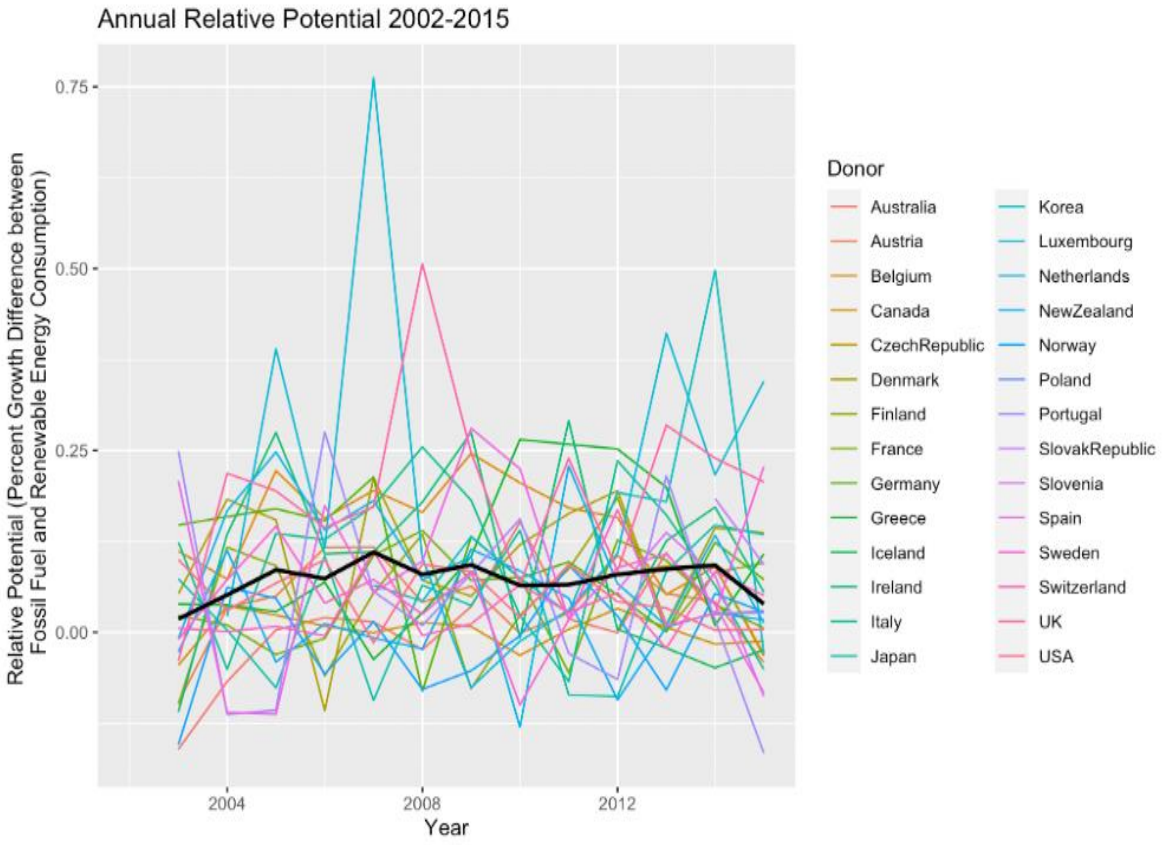
Table 4.

Descriptive Statistics: Relative Potential by Country *

Donor Country	Average Relative Potential	Relative Potential Minimum	Relative Potential Maximum
Australia	0.01	-0.16	0.15
Austria	0.04	-0.1	0.11
Belgium	0.14	-0.03	0.25
Canada	0.002	-0.05	0.04
Czech Republic	0.06	-0.03	0.09
Denmark	0.11	-0.11	0.21
Finland	0.05	-0.1	0.18
France	0.05	-0.06	0.14
Germany	0.1	-0.08	0.21
Greece	0.09	-0.04	0.27
Iceland	-0.02	-0.05	0.004
Ireland	0.12	-0.11	0.29
Italy	0.03	-0.09	0.15
Japan	0.03	-0.09	0.15
Korea	0.13	-0.03	0.5
Luxembourg	0.2	-0.08	0.76
Netherlands	0.09	-0.13	0.25
New Zealand	0.02	-0.09	0.11
Norway	-0.008	-0.15	-0.09
Poland	0.025	0.026	0.027
Portugal	0.04	-0.16	0.27
Slovak Republic	0.14	0.09	0.18
Slovenia	0.05	-0.09	0.14
Spain	0.08	0.11	0.28
Sweden	0.06	-0.1	0.22
Switzerland	0.03	-0.02	0.11
United Kingdom	0.2	-0.04	0.51
United States	0.05	-0.01	0.1
Averages	0.07	-0.06	0.2

* Relative Potential = Difference in Renewable energy industry and fossil fuel industry growth rates.

Figure 6.



Figures A.18 and A.19 in the appendix show countries in the sample that have historically higher and lower relative potential respectively. Descriptive statistics for relative potential are in table A.3 in the appendix. For higher relative potential, five countries are included, which all either have an average relative potential above or close to the 3rd quartile of relative potential, 0.134. There is no clear consistent trend for these countries. Each has peak years of high relative potential, and each has dips in their relative potential. I will also note that Slovak Republic only has two observations in the data set because in the sample there is only data for this country for three years, 2013-2015. While this chart appears to show a decline in their relative potential from 2014 to 2015, they rank rather high in relative potential from 2013-2014 resulting in their overall average keeping them in the top grouping. For lower relative

potential, five countries are included, which are all either have an average relative potential below or close to the 1st quartile of relative potential, 0.005. Again, there is no clear consistent trend for these countries. Each have peak years of high relative potential, and each have dips in their relative potential. The one clear difference here is that the countries in the low category often have numerous years where their relative potential is negative, suggesting the percent growth of their fossil fuel industry in these years is outpacing the percent growth of the renewable energy industry.

My third hypothesis expects that the impact of relative potential will be moderated by the domestic institutions in each state, or level of governance. The data for level of governance was gathered from the Worldwide Governance Indicators Index. This index measured governance across six dimensions, control of corruption, government effectiveness, political stability and absence of violence, regulatory quality, voice and accountability, and rule of law. Each dimension is ranked on a scale from -2.5 to 2.5, where higher scores are associated with higher quality institutions. In my models I use an additive variable of each score in each category to create a total overall level of governance measure. With my additive variable the highest score a country could receive is 15 and the lowest would be -15. All the countries in my sample are considered democracies so no country in my sample as a negative score for any year.

Table 4 shows the average score for each country over the time period of the sample, and the minimum and maximum score for each country. The countries with the three highest average governances scores are Finland (11.17), Denmark (10.91) and New Zealand (10.66). The countries with the three lowest governance scores on average are Greece (3.66), Italy (3.6) and the Slovak Republic (4.36). Greece and Italy are noteworthy for having the lowest scores

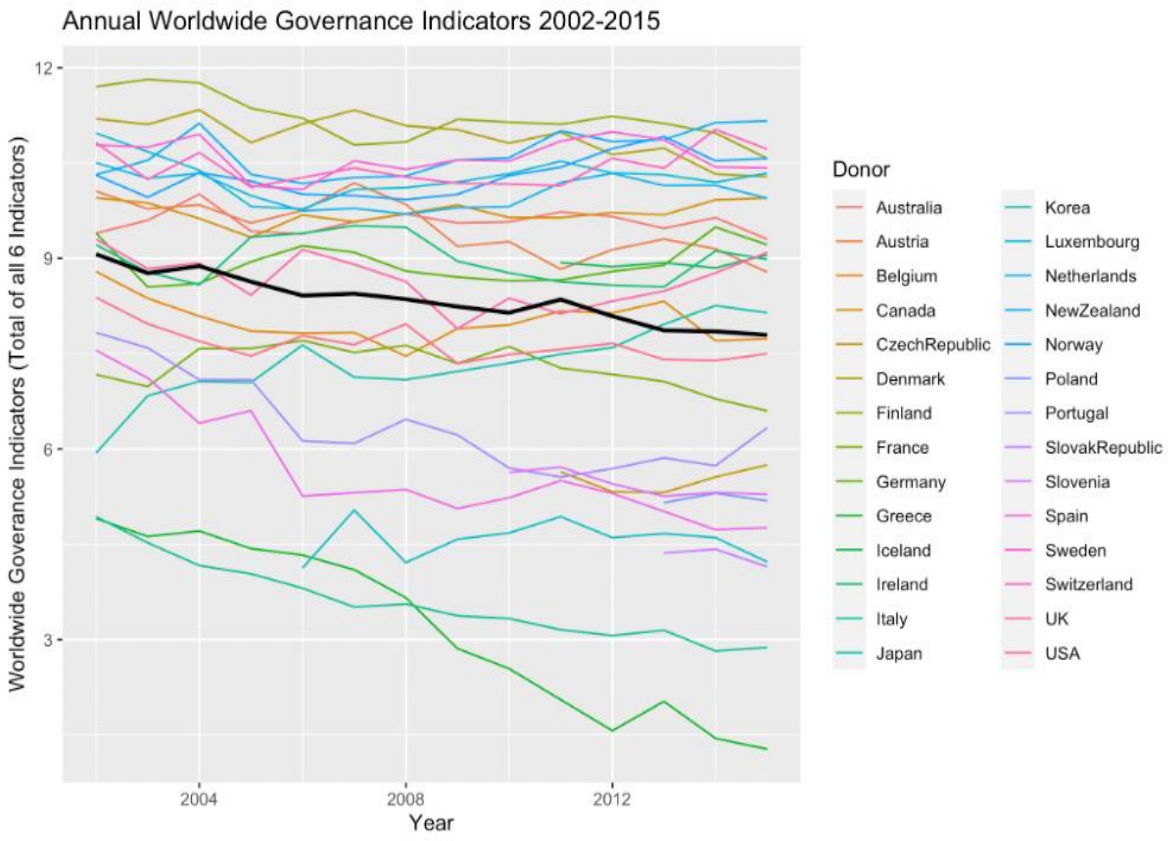
because both their total governance scores began declining rapidly in 2008, likely a result of the global financial crisis. But both Greece and Italy had governance scores well below the average during the entire time period, so the financial crisis of 2008 is not solely responsible for their low scores. Figure A.20 in the appendix shows the annual average worldwide governance score for each country and orders them from highest scores to lowest. Figure 7 shows the change in governance scores for each country over time and interestingly shows a downward trend for almost all countries in the sample. Figure A.17 in the appendix shows countries average governance score over this time period ranked highest to lowest.

Table 4.

Descriptive Statistics: Governance Scores by Country

Donor Country	Average Governance Score	Governance Score Minimum	Governance Score Maximum
Australia	9.58	9.31	10.01
Austria	9.43	8.78	10.19
Belgium	8.01	7.46	8.79
Canada	9.73	9.33	9.95
Czech Republic	5.56	5.31	5.75
Denmark	10.91	10.29	11.34
Finland	11.17	10.57	11.82
France	7.29	6.6	7.71
Germany	8.93	8.55	9.5
Greece	3.66	1.28	4.91
Iceland	8.93	8.85	9.06
Ireland	8.99	8.55	9.52
Italy	3.6	2.82	4.93
Japan	7.34	5.94	8.26
Korea	4.57	4.13	5.04
Luxembourg	10.26	9.78	10.97
Netherlands	10.01	9.7	10.51
New Zealand	10.66	10.18	11.16
Norway	10.3	9.93	10.96
Poland	5.19	5.16	5.31
Portugal	6.39	5.56	7.83
Slovak Republic	4.36	4.15	4.42
Slovenia	5.44	5.26	5.72
Spain	5.66	4.73	7.55
Sweden	10.59	10.09	10.99
Switzerland	10.43	10.12	11.03
United Kingdom	8.66	7.89	9.3
United States	7.66	7.35	8.38
Averages	7.96	7.42	8.6

Figure 7.



4.7 Modeling strategy

I test each hypothesis utilizing a time-series regression model which includes yearly observations of my dependent variable, independent variables, and controls from 2002-2015. A large-N time series analysis is the best approach to understanding my research question for many reasons. First, for statistical purposes, using a large-N time-series quantitative approach allows for a sufficiently large sample to allow for generalizability and greater assurance of external validity. Second, a large-N time-series study allows for analysis over time which is important to identify changing patterns in the energy sector across societies and how that may relate to changing patterns of climate aid contributions. For example, a goal of this dissertation is to understand how the emerging renewable energy industry has impacted donor preferences

relative to the impact of the incumbent fossil fuel industry. Third, utilizing this approach allows for analysis of large groups in society in a way that qualitative research would not. I aim to understand how the capacity, potential and organizational ability of the fossil fuel and renewable energy industries have related to each other and how these dynamics can impact climate aid allocation. Analyzing each group as a whole can best capture the comparative power and influence of these groups. While a qualitative investigation would undoubtedly shed light on the question of how these industries influence states, the initial step is to investigate if there is a relationship between these groups and outcomes.

Numerous factors outside of the energy sector are likely to influence climate aid policy. To account for these factors, my models also include additional control variables that appear in the literature. A total score for level of governance is included in all models, as a control in the first two models and then as an interactive independent variable in the third model. The level of governance is an additive score from the Worldwide Governance Indicators Index. Level of governance is included in multiple studies about who receives climate aid (Hick et al. 2008; Halimanjaya, 2015; Halimanjaya & Papyrakis 2015; Robinson & Dornan, 2015; Weiler et al. 2018) and as a control in a few studies on donors (Halimanjaya and Papyrakis (2015), Klock et al. 2018, Peterson 2022)

All models also include GDP per capita to control for higher income states. This needs to be included to account for capacity variation between states (Halimanjaya & Papyrakis 2015, Klock et al 2018, Peterson 2022). States with higher incomes per capita are expected to have more resources available to allocate towards foreign aid. Unlike the literature, I also include GDP in each model to account for the overall wealth of each state. GDP is an important control to include because it measures the size of each donor state's economy as a whole and

because the providers of foreign aid and climate aid tend to rank in the higher GDP countries. Unlike Peterson (2022) and Halimanjaya and Papyrakis (2015), I do not include population as a control. This is because my model focuses on economic driver of climate aid, and I do not have any theoretical argument for why population should influence climate aid policy (indeed, Japan, which has a small population is routinely one of the biggest donors). I include GDP per capita in all my models to instead of populations to proxy for capacity. A final control added to all models is CO2 emissions per capita to proxy for historical responsibility for climate change (Halimanjaya & Papyrakis; Klock et al. 2018; Peterson 2022).

I use the following models to test my three hypotheses:

Model 1: Proportional climate aid $= \beta 0 + \beta 1\ Fossil\ Fuel\ energy\ consumption + \beta 2\ World\ Govnernace\ Indicator + \beta 3\ CO2\ per\ capita + \beta 4\ GDP + \beta 5\ GDP\ per\ capita$

Model 2: Proportional Climate Aid $= \beta 0 + \beta 1\ Renewable\ Electric\ Production + \beta 2\ World\ Govnernace\ Indicator + \beta 3\ CO2\ per\ cap + \beta 4\ GDP + \beta 5\ GDP\ Per\ capita$

Model 3: Proportional Climate Aid =

$$\beta 0 + \beta 1 relative\ potential + \beta 2\ World\ Governance\ Indidcators + \beta 3\ relative\ potential * World\ Governance\ Indidcators + \beta 4 CO2\ per\ Capita + \beta 5\ GDP + \beta 6\ GDP\ per\ Capita$$

All independent variables and control variables were lagged one year, and most were logged (except governance scores and relative potential) to correct for irregular distribution problems. Lagging variables is important because we would expect the previous year's fossil fuel consumption or renewable electricity production to be a predictor of the following year of climate aid, not the current year. The dependent variable in all models is also logged. In addition, each model includes country fixed effects which account for time invariant characteristics within states. For this reason, my unit of comparison is within a single country across time, rather than across countries. Using country-fixed effects control for unique, country-specific factors that are constant across time. However, there could be linear or nonlinear time trends causing unobserved confounders. To control for these factors each model also includes a cubic polynomial of time.

5. RESULTS

In this chapter, I present the results of my a large-N quantitative analysis for my three hypotheses. Model 1 tests the hypothesis that as fossil fuel consumption increases within a state, climate aid relative to total ODA will decrease. Model 2 tests the hypothesis that as renewable energy electricity production within a state increase, climate aid relative to ODA will increase. Finally Model 3 tests my interaction hypothesis that expects the impact of the relative potential of the renewable energy industry compared to the fossil fuel industry on a donor state's contributions to climate aid will increase as the level of governance increases. The findings from Model 1 does not support this hypothesis while the findings from Models 2 and 3 do support my hypotheses.

5.1 H1: Fossil Fuel Industry Influence on Climate Aid

5.1a Results

My first hypothesis tests if higher levels of fossil fuel consumption in a country are associated with lower relative proportions of climate aid. This hypothesis rests on the assumption that the fossil fuel industry can be expected to be one of the clear losers if states begin to make a meaningful effort in combating climate change, which is likely to include increasing amounts of climate aid. The fossil fuel industry can be expected to lose out because climate aid is used in part to support mitigation efforts. The degree to which the fossil fuel industry will be able to influence donor preferences will depend in part on how important it is to a state's economy and its lobbying capacity. The more fossil fuels consumed in a country, the more that state is reliant on this industry and the more likely the fossil fuel industry will put resources into lobbying for its agenda.

H1: As the current share of fossil fuel energy consumption (as a proportion of total energy consumption) increases in a state, the relative amount a donor will contribute to climate aid (as a proportion of total ODA) will decrease.

The results from Model 1 are presented in Figure 8. Surprisingly, the findings do not support my hypothesis. Instead, fossil fuel consumption has a positive and significant association with climate aid rather than a negative correlation. Model 1 shows there is a strong positive correlation between the amount of proportional climate aid and the amount of fossil fuels consumed in a country each year with a p-value of less than .01. Both the dependent and independent variables in the model are logged which means a 1% increase in the independent variable is associated with a percent increase in the dependent variable of the coefficient. The results show that a 1% increase in fossil fuel consumption is correlated on average with a 4.788% increase in proportional climate aid as a percent of ODA in the following year, all else equal. This may seem large in comparison to the coefficients in latter models, but it is important to consider that in OECD countries, the average fossil fuel energy consumption is 73.66% of total energy consumption and the median is 79.57%. This means that a 1% increase in fossil fuel energy consumption is a larger increase in absolute terms because most countries are consuming at a rather high rate. This unexpected finding could be due to a missing domestic factor in the model, a mischaracterization of the fossil fuel industry's motivations and/or the need for a better measure of fossil fuel industry influence. These possibilities will be expanded upon in the following discussion section.

Model 1 also shows interesting findings regarding the control variables. Level of governance is not significant in this model. CO2 emissions are significant and negatively

correlated with climate aid showing that historic responsibility is not an accurate predictor of amount of climate aid each country allocates. GDP per capita is significant and negatively correlated with the amount of climate aid countries provide. GDP per capita is used to measure the overall economic capacity of a state to provide aid; the model shows that the capacity to provide more aid does not result in countries doing so. In contrast to GDP per capita, GDP has a significant and positive correlation with climate aid. Both the coefficients for GDP and GDP per capita are large in comparison to the other coefficients. Finally, Model 1 has an adjusted R^2 of 0.747 suggesting that this model explains 75% of the variation of the dependent variable. Figure 8.

Climate Aid and Fossil Fuel Energy Consumption

	Dependent variable:
	DV.ps.con.l
Fossil Fuel Consumption (% of total) (log)	4.788***
	(1.028)
World Governace Indicators	0.132
	(0.110)
CO2 Per Capita (log)	-3.168***
	(1.008)
GDP (log)	16.036***
	(4.534)
GDP Per Capita (log)	-15.913***
	(4.903)
Time	0.003
	(0.038)
Observations	309
R^2	0.774
Adjusted R^2	0.747
Residual Std. Error	0.609 (df = 275)
Note:	*p<0.1; **p<0.05; ***p<0.01

5.1b Discussion

I did not find the expected results from H1, suggesting further exploration is needed. My results suggest that all other factors being equal, greater domestic consumption of fossil fuels results in prioritization of climate aid, relative to other forms of ODA. I posit three possible explanations for this result. First, there may be domestic factors that could be interacting with fossil fuel consumption, as recent research by Peterson (2022) suggests. Second, the motivations of the fossil fuel industry could be different and more complex than what my theory proposes. A third potential reason for the finding is that fossil fuel consumption may not be an effective measure of industry influence.

One possible explanation for the positive relationship between fossil fuel consumption and climate aid is built on a recognition of the complexity and interconnectedness of domestic and international climate politics. When a state has stronger domestic environmental policies, domestic industry could prefer stronger international environmental policies to make competition on the international markets more even. A recent study by Peterson (2022) on climate aid investigates how domestic climate ambition interacts with different variables commonly used in climate aid research in ways that change the relationship between various independent variables and climate aid. Specifically, Peterson tests the interaction between domestic climate ambition and the size of the carbon intensive manufacturing sector. Peterson describes their measure of carbon intensive industry as "the size of carbon-intensive industry (manufacturing, mining and utilities) relative to GDP from UNSD" (pg. 105) as used by Steves and Teytelboym (2013) in a working paper who further describe this variable as "the share of carbon-intensive industries – manufacturing, mining and utilities – in each country's Gross Domestic Product was used as a rough proxy" (pg.13). The Peterson study hypothesizes that

higher levels of domestic climate ambition and a larger carbon intensive industrial sector will result in higher levels of international climate aid. The logic behind this is that if there are stringent domestic climate policies, the carbon intensive industries will want more stringent international climate polices to even the playing field of economic competition (Kelemen & Vogel 2010). In addition, the converse side of the interactions of the model expects that low domestic ambition and strong carbon intensive industry will result in lower amounts of climate aid. Interestingly, they find the opposite results of what they expect. As domestic ambition increases, countries provide more climate aid but only when the carbon intensive industrial sector decreases. Their finding is consistent with the theory informing my first hypothesis although not my Model 1 results. This suggest I may have a missing variable in my theory and model, namely domestic climate ambition, although it is important to note the multiple methodological differences between my research and the Peterson study.[22] In particular, it would be interesting to explore domestic climate ambition via the proxy of domestic environmental spending. Given my research focus on what influences what governments

[22] In addition to a different independent variable, differences pertain to the construction of the dependent variable and the sample. Peterson's measure for climate aid only includes aid designated by countries as to be targeted towards mitigation while this dissertation includes all five types of climate aid. the Peterson study does not specify if this measure includes mitigation aid categorized as principle, significant or not targeted. This dissertation includes climate aid that is considered principle and significant but specifically excludes not targeted aid. Finally, Peterson uses mitigation aid per unit of GDP as the DV and ODA as a control variable, while this dissertation uses climate aid as a proportion of ODA. Finally, the sample used by Peterson differs in the countries included and the years covered by the analysis. Peterson uses a time series study from 2008-2017 which is more recent than this dissertation but does not cover the years directly after the US withdraw from the Kyoto Protocol which I believe to be important to consider. In addition, Peterson uses a smaller selection of countries. Peterson also uses OECD countries but excludes the Czech Republic, Poland, Slovak Republic, and Slovenia. While these countries are not as large or a wealthy as some of the other OECD countries, they are not uniquely so. But it is important to note that Peterson excluded these countries because they were not Annex II countries, but they did include Korea in their analysis which is also not an Annex II country. Annex II countries are "developed countries which pay for the costs of developing countries" (UNFCCC).

choose to finance, one possible influence on climate aid is how governments are spending domestically on environmental issues.

A second possible explanation for the surprising relationship between fossil fuel consumption and climate aid is that the fossil fuel industry might prefer to support climate policies in other countries. While fossil fuel corporations can be adversarial to national and international climate policy efforts, they can also support climate action if they see economic benefits. For example, when domestic environmental regulations impose costs on domestic business, they can align with environmental groups interests because domestic regulation can increase costs domestically and decrease domestic businesses' ability to compete internationally (DeSombre 1995; DeSombre 2000; Kennard 2020).

Moreover, there may also be differences across countries. US corporations are used to the competitive pluralistic lobbying style of the US while European corporations may prefer the consultative role of industry found in the corporatist systems of Europe. These diverging preferences of lobbying style have led to inconsistent industry participation in international environmental negotiations and the fractionalization of transnational industry associations (Pulver, 2002). While there is compelling evidence of adversarial tactics that US based oil majors and electric utility companies employ, relationships between industry and European governments are often more collaborative (Pulver 2007; Skjærseth and Skodvin 2001; Levy and Kolk 2002; Sæverud and Skjærseth 2007). Many European countries have a more corporatist arrangement with interest groups, allowing for policymaking to be more collaborative between government and industry resulting in industry having a role in policymaking (Scruggs 2003). This can result in industry having a say in how climate aid is used and enable them to work with their states' governments in using that climate aid in a way

that minimizes damage to their industry. The sample in this dissertation is overwhelmingly European, which may explain why more fossil fuel consumption is associated with more climate aid.

Fossil fuel companies may also support climate aid because it will direct funds overseas in the hopes that there will be less funding to focus on environmental projects at home. The fossil fuel industry would be expected to prefer to maintain the status quo in regard to how the world meets its energy needs. Maintaining the status quo would be particularly important to the fossil fuel industries in advanced economies that have a much higher fossil fuel consumption compared to developing economies. OECD countries are the main purveyors of climate aid, and many are among the highest consumers of fossil fuels. But the fossil fuel industry knows the status quo is changing. Despite their attempts to delegitimize and deny the existence of climate change (Oreskes & Conway, 2010), they have failed. While action to combat climate change has not been rapid enough to satisfy the Intergovernmental Panel for Climate Change (IPCC), policymakers still have had dealing with climate change on the agenda to some degree for years. The fossil fuel industry could be hedging their bets by supporting climate action such as climate aid in developing nations to avoid those efforts being stronger in their home countries.

Fossil fuel companies may calculate that as more funding goes to developing countries, they will have an easier time maintaining status quo polices at home and continue profiting off rich countries' energy consumption. Furthermore, not all climate aid is used solely for mitigation projects. For example, climate aid can be used for water management projects, biodiversity projects, and land degradation projects, to name a few. Due to many of these

projects not directly impacting the fossil fuel industry, the industry may be less likely to oppose climate aid in general.

Furthermore, if the fossil fuel industry supports climate aid, this could be considered a form of "greenwashing" which is defined as the portrayal of a company or product as being more environmentally friendly. The four major fossil fuel companies (Exxon Mobil, BP, Shell and Chevron) all have sections on their websites that outline how they are contributing to reducing their impact on climate change. Each website references their efforts in global innovation, carbon capture technologies, clean technologies, and providing sustainable energy to the world. Despite this, many experts have identified how this is mostly cheap talk, and these companies are not fulfilling the pledges they make publicly. In an examination of a newly constructed dataset Mahdavi et. al., (2022) find "little evidence that oil and gas majors are making meaningful efforts with regard to decarbonization." Likewise, a British environmental charity ClientEarth, in its greenwashing files, extensively outlines how all four of these major fossil fuel companies and others are not following through on their promises (ClientEarth, 2022). The greenwashing files show how these companies have said they are committed to the goals of the Paris Climate Accords, but with little or no actual action to reduce their carbon emissions (ClientEarth, 2022).

If fossil fuel companies support climate aid in developing countries, this could be considered another form of greenwashing. Fossil fuel companies can publicize these efforts and use their support to look as though they are part of the solution. This is effectively a form of greenwashing because of the greater motives of the fossil fuel industry that I described above. If given the choice, the fossil fuel industry would rather rich countries send more environmental financing to developing countries than focus this financing at home.

This benefits the fossil fuel industry for many reasons. Climate aid is used for a wide array of climate projects -- not just mitigation efforts. If this financing were used at home, it would most likely go to mitigation projects because developed countries do not face as many other challenges such as access to clean water. Developing countries consume a comparatively small amount of fossil fuels in compared to developed countries: as a result, developing country consumers are more less profitable than consumers in developed economies. Finally, fossil fuel companies can use their support for climate aid to mask their broader resistance to all other major climate change policies at home.

Finally, it is possible that the results do not support my hypothesis because my operationalization of fossil fuel consumption does not proxy for fossil fuel industry influence. To that end, I explored two alternative operationalizations of influence: fossil fuel contributions to electricity production and fossil fuel rents. Fossil fuel contributions to the electricity production is a percentage of total electricity produced in the country. Fossil fuel rents is the value of the extracted materials at their regional price but also deducts the costs of extracting and refining the materials. Interestingly, as can be seen in table A.4 in the appendix, these different measures are not consistently correlated with one another. Fossil fuel consumption has a strong correlation with fossil fuel electricity production at 0.77, but a much weaker correlation with fossil fuel rents at 0.2. Fossil fuel rents and fossil fuel electricity production has almost zero correlation to each other at 0.03. When each of these possible alternative measures of for fossil fuel influence are substituted as the independent variable in the model neither gains statistical significance as can be seen in figure 9. A better measure for fossil fuel influence is likely necessary to understand this relationship.

Figure 9.

Climate Aid and Alternative Fossil Fuel Measures

	Dependent variable:		
	DV.ps.con.l		
	(1)	(2)	(3)
Fossil Fuel Consumption (% of total) (log)	4.788***		
	(1.028)		
Fossil Fuel Electricity Production (% of total) (log)		0.136	
		(0.134)	
Fossil Fuel Rents (log)			0.157
			(0.218)
World Governace Indicators	0.132	0.150	0.174
	(0.110)	(0.112)	(0.112)
CO2 Per Capita (log)	-3.168***	-1.213	-0.898
	(1.008)	(1.005)	(0.972)
GDP Constant (log)	16.036***	16.906***	17.025***
	(4.534)	(4.873)	(4.567)
GDP Per Capita Constant (log)	-15.913***	-17.935***	-18.692***
	(4.903)	(5.389)	(5.210)
Observations	309	309	309
R^2	0.774	0.766	0.768
Adjusted R^2	0.747	0.738	0.740
Residual Std. Error (df = 275)	0.609	0.619	0.617
Note:	*p<0.1; **p<0.05; ***p<0.01		

Despite not receiving expected results, the findings for this hypothesis are still useful. They indicate that further research is worthwhile to better understand how the fossil fuel industry could be influencing climate aid decisions and what their motives around this issue may be. I present here just some possibilities for future research. These avenues for future theories to explain the inconsistent findings do not contradict previous research but instead offer complimentary explanations. While this dissertation uses different measures from the Peterson study for example, the theoretical basis between both studies is the same. That the fossil fuel industry is likely to have preferences over climate aid even if neither of our studies have fully discovered what those preferences are.

The findings regarding the control variables also merit discussion because they highlight the emergent nature of research on donor preferences regarding climate aid. There is no consensus in the literature on how to construct the dependent variable and on which control variables to include. Therefore, there are many contradictions across studies. Klock et al. (2018) supports my finding that CO2 emissions are negatively correlated with climate aid. However, my finding that GDP per capita is negatively correlated with the amount of climate aid is in contrast to the findings of Klock et al. (2018) but in line with the findings of Peterson (2022). It is worth restating that none of these studies include GDP as a control variable, as is the common practice in the international relations literature more generally.

The contradictory results between GDP and GDP per capita are puzzling and also merit discussion. First, this could be due to the divergence in what each figure represents. GDP per capita is a better representation the overall wealth of the country, while GDP alone does not account for population size and thus is not as good of a measure of overall wealth. Regardless, the countries in this sample all have high GDP's relative to other countries in the world which is why they are providing aid. A possible reason for why a country with a higher GDP and a lower GDP per capita may prioritize climate aid over other types of aid is because they could be attempting to specialize in a certain international issue area and since they do not have the capacity that a country with a high GDP per capita has, they may need to select fewer issue areas to focus and thus a higher proportion goes to one priority such as climate aid.

A broader but connected possibility is considering the alternative option of prioritization other than climate aid, such as aid focused on classic development strategies. Countries with a higher GDP per capita likely have a long history of investment in development

aid which help them reach the wealth level that they are current at, this may have become entrenched in their policy preferences and less likely to shift than for other countries.

Interestingly, the data shows that the country with the highest GDP over the time period is the United States, but they rank towards the bottom of climate aid providers, while in contrast Iceland has the lowest GDP but is the second to highest on average contributor to climate aid. This suggests that the middle countries must be driving this result. Similarly perplexing, Luxembourg has the highest GDP per capita over the time period while Poland has the lowest yet, both these countries are in the bottom quartile of climate aid providers. These results may also just be simply due to the fact that neither of these variables has a particularly linear relationship with proportional climate aid as can be seen in appendix in figures A.21 and A.22.

5.2 H2: Renewable Energy Influence on Climate Aid

5.2a Results

My second hypothesis posits that on average within countries, higher levels of renewable electricity production are associated with higher amounts of climate aid as a proportion of total ODA. This hypothesis rests on the assumption that the renewable energy industry is an emerging industry and climate aid will help broaden market opportunities for it in other countries (Lewis 2014). In contrast to the fossil fuel industry, the renewable energy industry can be expected to gain from increasing amount of climate aid. The focus of climate aid on mitigation and adaptation provides clear incentives for the renewable energy industry to favor increasing amounts of climate aid. While not all climate aid focuses on transitioning the energy sector of developing countries to a more sustainable one, increasing the amount of

climate aid shows a commitment by donor countries to this path of a sustainable energy transition.

> *H2: As the current share of renewable electricity produced (as a proportion of total electricity produced) increases in a state, the amount a donor contributes to climate (as a proportion of total ODA) aid will increase.*

The results from Model 2 are presented in Figure 10 and these results support hypothesis H2, showing that renewable electricity production has a positive correlation with climate aid. Model 2 shows there is a strong positive correlation between the amount of renewable electricity produced in a country each year and the amount of proportional climate aid, with a p-value of less than .01. Again, both the dependent and independent variables in the model are logged which means a 1% increase in the independent variable is associated with a percent increase in the dependent variable of the coefficient. The results show that a 1% increase in renewable electricity production is correlated on average with a .59% increase in proportional climate aid in the following year, all else equal. For example, when using average ODA for each country and average proportion of that which is climate aid, a 1% increase in renewable electricity production would result in a 18 million US dollar increase in climate aid for Japan (the top proportional climate aid donor), a 5 US million increase for Norway (a middle proportional climate aid donor), and a 117 million US dollar increase for the US (A bottom proportional climate aid donor).

Model 2 also shows some interesting and expected findings regarding control variables. As in Model 1, GDP remains positively correlated with climate aid, and GDP per capita remains negatively correlated with both coefficients increasing slightly. In contrast to Model

1, CO2 emissions are per capita no longer statistically significant. Furthermore, the level of governance measure increases in statistical significance but does not reach the level of a p-value of less than 0.05. Model 2 has an adjusted R^2 of 0.75 suggesting that this model explains 75% of the variation of the dependent variable.

Figure 10.

Climate Aid and Renewable Electricity Production

	Dependent variable:
	DV.ps.con.l
Renewable Electricity Production (% of total) (log)	0.590***
	(0.201)
World Governace Indicators	0.208*
	(0.111)
CO2 Per Capita (log)	-0.888
	(0.906)
GDP (log)	16.488***
	(4.205)
GDP Per Capita (log)	-17.511***
	(4.574)
Time	-0.060
	(0.045)
Observations	309
R^2	0.777
Adjusted R^2	0.750
Residual Std. Error	0.605 (df = 275)
Note:	*p<0.1; **p<0.05; ***p<0.01

5.5b Discussion

Model 2 provides strong support for H2 and the relationship between domestic renewable electricity production and climate aid. The renewable energy is likely to benefit from more climate aid because a major goal of climate aid is to create sustainable energy in developing countries. Increasing amount of climate aid is likely to open more markets for the

renewable energy industry in places that are unlikely to be able to afford the technology without climate aid. This finding has numerous important implications for the future of climate aid and the role of renewable energy in this future. Regarding future research, this is the first study of the impact of renewable energy on climate aid outcomes. Some studies have looked at the role of industry (Hicks et al 2008, McLean 2015, Peterson 2022), but none of these address the renewable energy industry. Rather previous studies have focused on industry size and strength as a proxy of fossil fuel dominance in different states.

For the study of climate aid, these findings also show how important it is to consider the domestic economic characteristics of donor states. Most studies of climate aid focus on domestic characteristics of climate aid recipients. While such studies help us understand who receives aid, they do not help us understand how much aid is given by donors. This is a crucial gap because the amount of climate aid given thus far has been woefully short of what is required to help developing countries and far short of what donor countries have promised to provide in the past.

Overall, what these findings ultimately show is that relevant domestic economic groups like the renewable energy industry have a vested interest in climate aid outcomes. The renewable energy industry does not only want to expand domestically, but they likely see climate aid as a bridge to expanding their industry overseas in places that would otherwise be unable to afford bringing renewable energy into their country. On average, 63% of climate aid intended for mitigation purposes is invested in renewable energy generation (Buchner et al. 2019). Climate aid provides the renewable energy industry with an opportunity to expand their industry into new and untapped markets. These results show that climate aid is not as apolitical

domestically as some have thought. There is a domestic political battle over climate aid choices as well as the politics of climate aid at international climate summits.

Finally, this analysis shows the power of the renewable energy industry. There have been countless studies in political science on the power and influence of the fossil fuel industry in international climate summits and domestic politics, but far less has been done pertaining to the influence of the renewable energy industry. This is to be expected because the fossil fuel industry has been around much longer, and their influence is entrenched. The renewable energy industry in comparison, is a new player on the field. The results here show that the renewable energy industry is having some impact on donor's climate aid decisions. While I was not able to prove direct influence, the results do show a strong correlation which suggests the renewable energy industry is playing some role.

5.3 H3: Influence of Relative Potential on Climate Aid

5.3a Results

My third hypothesis posits that governance serves as an important moderator in determining climate aid outcomes. More specifically, the relative potential of the renewable versus fossil fuel energy industries in a country can impact the amount of climate aid a donor provides, but the level of governance of the donor will moderate this impact. Not all democracies are created equal, and there is variation in the quality of domestic institutions even in democracies. H3 expects that domestic institutions will be a moderating factor in which part of the energy sector has influence on their governments. Relative potential is a measure of how much each of the two industries grows or shrinks from one year to the next as compared to the other. This is the foundation of my third hypothesis.

H3: The impact of the relative potential of the renewable energy industry compared to the fossil fuel industry on a donor's contributions to climate aid (as a proportion of total ODA) will increase as the level of governance increases.

The results from Model 3 are presented in Figure 11 and these results support H3, showing that the relative potential of the renewable energy industry relative to the fossil fuel industry has a positive association with climate aid as a proportion of ODA when it is interacted with the level of governance. The interaction between relative potential and level of governance has a p-value of less than .05.

Figure 11.

Climate Aid and Relative Potential of the Fossil Fuel and Renewable Energy Consumptions

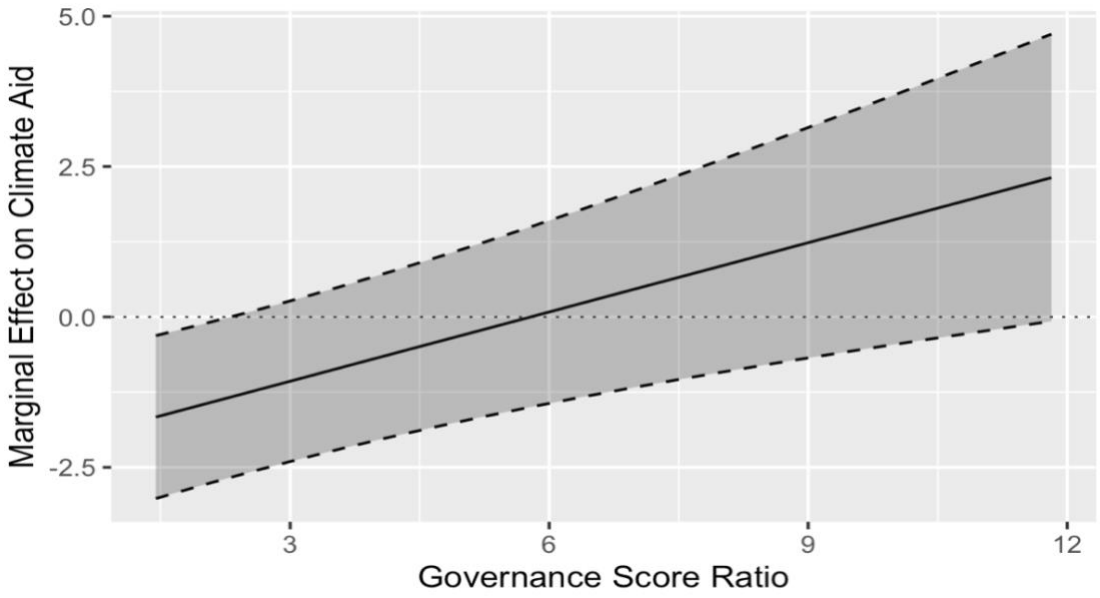
	Dependent variable:
	DV.ps.con.l
Relative Potential of Energy Consumption	-2.220**
	(0.880)
World Governace Indicators	0.128
	(0.131)
CO2 Per Capita (log)	-0.490
	(1.078)
GDP (log)	17.538***
	(4.799)
GDP Per Capital (log)	-18.999***
	(5.199)
Time	0.030
	(0.044)
Relative Potential and World Governance Interaction	0.256**
	(0.096)
Observations	281
R^2	0.771
Adjusted R^2	0.740
Residual Std. Error	0.593 (df = 246)
Note:	*p<0.1; **p<0.05; ***p<0.01

Because this relationship depends on an interactive effect, it cannot be interpreted directly but instead is important to look at through a marginal effects plot. Figure 12 illustrates the marginal effects of governance scores on relative potential. This graph shows that relationship between governance scores and relative potential is positive, but this relationship is only statistically significant when governance scores are low. This evidence supports H3 because it suggests that when a country governance score is low, relative potential does not have a positive impact on climate aid. In contrast, when governance scores are high, relative potential has a positive impact on the provision of climate aid, but this cannot be said definitively because the confidence bands in figure 12 cross zero. This is likely to be the case because countries with low levels of governance are more likely to subject to corruption and influence by narrow entrenched special interest such as the fossil fuel industry, regardless of their comparative potential to the renewable energy industry. Furthermore, countries that have a particularly high level of governance likely do not have the same tendency towards corruption due to institutional arrangements that prevent policymakers from serving narrow entrenched interests above the interests of the larger community.

Notably, this marginal effects plot is significant at the 90% confidence interval and not the 95% confidence interval. One explanation for this decrease in significance might be the loss of power in the sample, as there are fewer observations concentrated at certain governance levels. If my sample were increased and there were more observations of certain governances scores multiple times over multiple years, the power of the model would increase and may meet the 95% confidence interval and may increase the significant of the effect overall.

Figure 12.

Marginal Effects Plot of Governance Score and Relative Potential on Climate Aid



Model 3 also includes variables that account for the independent contributions of relative potential and governance scores. The coefficients for these variables indicate the impact of each variable when the alternative corresponding variable is set to zero. When a country has a governance score of zero, relative potential has a negative effect. When relative potential is zero, level of governance has a positive effect, albeit insignificant, relationship with climate aid. Because these variables are part of an interaction term, however, it is more useful looking at the interactive relationship, which provides tentative support for my hypothesis. Model 3 also has an adjusted R^2 of 0.74 suggesting that this model explains 74% of the variation of the dependent variable.

5.3b Discussion

The findings from Model 3 support my expectation that the relative potential of the renewable energy industry compared to the fossil fuel industry on a donor state's contributions to climate aid as a proportion of ODA will increase as the level of governance increases, as

measured by an increase in Worldwide Governance Scores. These findings suggest numerous implications and add an important consideration to studies on donor state's climate aid choices, namely domestic institutions. Research seeking to explain who receives aid often finds that the states with stronger institutions tend to receive aid more often than those with weaker institutions and receive more climate aid. However, no study to date has considered how domestic institutions could impact the climate aid choices of donor states. The results here show that domestic institutions are an important factor to include.

Furthermore, Model 3 shows that domestic institutions alone do not impact outcomes, but they do when interacted with a measure of relative potential of the energy industry. Relative potential alone is negatively correlated with climate aid, but when interreacted with level of governance, this effect becomes positive. This suggests that institutions are an important mediator in policy choices. If the renewable energy industry is growing at a higher rate than the fossil fuel industry, you would expect this to be a strong signal to policymakers that the renewable energy industry has the potential to be a core energy source for the state in the future, and even the dominate one. It would also make sense that policy makers should then want to capitalize on this potential and have renewable energy be a future export for the country. Climate aid would be a useful means of allowing the renewable energy industry to expand its export markets. But relative potential of the renewable energy industry alone does not have this impact. Strong democratic institutions allow for the interests and potential of the renewable energy industry to be reflected policy makers choices.

This finding is important for the discussion of climate aid for a few reasons. First, it suggests that to increase climate aid, states also need to protect their democratic institutions. As seen in the previous chapter, democratic institutions have been declining in the countries

considered in this dissertation. In addition, the previous chapter shows that from 2002-2015, relative potential of the renewable energy industry has not been consistent. Increasing climate aid will be encouraged if the renewable energy industry is supported and allowed to expand. Relative potential was based on comparative energy type consumption, which means that to expand the relative potential of renewable energy, infrastructure needs to be expanded to allow better access to using renewable energy to the populations in these countries.

5.4 Robustness Checks

In addition to my main models, I employed several models to act as robustness checks for my core models presented above. In the first model in figure 13 the main independent variable remains fossil fuel energy consumption, but I add more controls to the model that the literature supports. Fossil fuel rents is a measure of the economic capacity of the fossil fuel industry in a state which could be what is driving this outcome, but these results are not significant (Hick et al. 2008). Political party in power is a measure of what type of parties are in power in each state during each year and the model shows that as left-wing party power increases there is a negative correlation with climate aid as supported by Halimanjaya & Papyrakis (2018). Some literature suggests foreign economic ties or trade drives foreign aid allocation (Lewis 2003, Figaj 2010). Using a measure of trade openness, the model finds a positive correlation with trade openness and provision of climate aid. Finally, other literature suggests that donor states with a colonial legacy provide more climate aid but using a dummy variable to categorize states as previous colonial powers or not, is found to be significant (Hicks et al. 2008; Lewis 2003; Figaj 2010; Robinson & Dornan 2015). Despite adding these controls my overall results remain largely the same for the main model, though they do decrease the coefficient for fossil fuel consumptions slightly.

In the second model in figure 13, I use an alternative independent variable, fossil fuel electricity production, because the share of electricity production that the fossil fuel industry provides industry could be an alternative measure of their influence. Furthermore, fossil fuel electricity production has a reasonably high correlation with fossil fuel consumption at 0.77, and unsurprisingly, it does not change the results of not relationship between variables. This check shows that fossil fuel energy production is not correlated with the provision of climate aid. This finding is somewhat expected because the majority fossil fuel is used in the transportation sector in OECD countries, where only a small portion of fossil fuels is used for electricity comparatively (IEA, 2020). This is still an important robustness check for the model because I use renewable electricity production as my proxy for the renewable energy industries capacity in model 2 making a comparison useful between the two industries.

Figure 13.

Climate Aid and Fossil Fuel Robustness Checks

	Dependent variable:	
	DV.ps.con.l	
	(1)	(2)
Fossil Fuel Consumption (% of total) (log)	4.363***	
	(0.778)	
Fossil Fuel Production (% of total) (log)		0.131
		(0.102)
World Governace Indicators	0.180*	0.196*
	(0.104)	(0.099)
CO2 Per Capita (log)	-2.778***	-0.971
	(0.746)	(0.889)
GDP (log)	14.239***	14.902***
	(3.651)	(3.812)
GDP Per Capita (log)	-14.018***	-15.684***
	(4.121)	(4.479)
Fossil Fuel Rents (log)	0.153	0.147
	(0.225)	(0.231)
Poltical Party in Power	-0.021*	-0.021*
	(0.011)	(0.011)
Trade Openess	0.011*	0.012*
	(0.006)	(0.006)
Colonizer		
	(0.000)	(0.000)
Observations	297	297
R^2	0.788	0.781
Adjusted R^2	0.760	0.753
Residual Std. Error (df = 262)	0.601	0.611
Note:	*p<0.1; **p<0.05; ***p<0.01	

In figure 14, I run five robustness check models for my renewable energy hypothesis. All of these models add the four aforementioned controls but also try different conceptualizations of the main renewable energy independent variable. The first model uses the original independent variable, renewable electricity production, and adds the four control variables. Despite these new controls being added, renewable electricity production remains significant, and the coefficient of the variable only decreases slightly from 0.59 in the original model to 0.588 in the new model with extra control variables added.

The second and third model in figure 14 changes the main independent variable to a three- and five-year moving average of renewable electricity production respectively. A moving average creates subsets within data and averages them. A moving average could be necessary to control for possible shocks in the market, but my original model includes fixed effects and the cubic polynomial of time to control for such instances. Yet some could claim that a moving average over time is a better predictor or how the renewable energy industry is growing over time and thus a better measure of potential. Neither moving average was found to be significant at to the level of 0.05 but the three-year moving average was significant at the 0.1 level with a p-value of 0.07.

Finally, the fourth and fifth robustness check models in figure 14 change the independent variable to renewable energy consumption as a percent of total energy consumption. The fourth model only includes control variables that I included in the original Model 2, and with only those controls, renewable energy consumption is not significant. The fifth model includes the four additional controls and its does increase the significance of renewable energy consumption but only to a p-value of less than 0.1 which is not sufficient for statistical significance.

Figure 14.

Climate Aid and Renewable Energy Robustness Checks

	Dependent variable:				
	DV.ps.con.l				
	(1)	(2)	(3)	(4)	(5)
Renewable Electricty Production (% of total)	0.581***				
	(0.182)				
Renewable Electricty Production (% of total) 3 Year Moving Average		0.412			
		(0.289)			
Renewable Electricty Production (% of total) 5 Year Moving Average			0.494		
			(0.433)		
Renewable Energy Consumption (% of total)				0.693	0.742*
				(0.416)	(0.394)
World Governace Indicators	0.242**	0.232**	0.255**	0.186*	0.221**
	(0.101)	(0.111)	(0.114)	(0.106)	(0.103)
CO2 Per Capita (log)	-0.537	-1.231	-2.213**	-0.123	0.234
	(0.733)	(0.874)	(1.045)	(1.051)	(0.915)
GDP Constant (Logged)	14.808***	19.158***	21.213***	17.008***	15.648***
	(3.360)	(4.053)	(3.863)	(4.020)	(3.660)
GDP Per Capita Constant(logged)	-15.498***	-20.431***	-24.926***	-18.514***	-16.692***
	(3.859)	(4.380)	(4.183)	(4.472)	(4.149)
Fossil Fuel Rents (logged)	0.127	0.123	0.299		0.083
	(0.240)	(0.255)	(0.234)		(0.180)
Poltical Party in Power	-0.017	-0.016	-0.032*		-0.026**
	(0.010)	(0.016)	(0.016)		(0.012)
Trade Openess	0.009	0.014**	0.016**		0.006
	(0.006)	(0.005)	(0.006)		(0.007)
Colonizer					
	(0.000)	(0.000)	(0.000)		(0.000)
Observations	297	245	196	309	297
R^2	0.790	0.790	0.815	0.776	0.790
Adjusted R^2	0.763	0.757	0.781	0.750	0.763
Residual Std. Error	0.598 (df = 262)	0.616 (df = 211)	0.597 (df = 165)	0.606 (df = 275)	0.598 (df = 262)
Note:					*p<0.1; **p<0.05; ***p<0.01

I run one robustness check model that looks at what occurs when both fossil fuel consumption and renewable electricity production for a country are both included in the same regression model in Figure 15. Interestingly, both the main independent variables, fossil fuel energy consumption and renewable electricity production remain statistically significant but the coefficients for both variables decrease. For fossil fuel energy consumption, the coefficient decreases by 1.051 and for renewable electricity production, the coefficient decreases by 0.116. This could suggest that when both fossil fuel consumption is high and renewable electricity

production is high, the two industries compete and decrease each other's impact on climate aid allocation in some way.

Figure 15.

Climate Aid and Fossil Fuel Energy Consumption and Renewable Electricty Production

	Dependent variable:
	DV.ps.con.l
	(2)
Fossil Fuel Energy Conspumption (% of total)	3.737***
	(1.049)
Renewable Electricty Production (% of total)	0.474**
	(0.213)
World Governace Indicators	0.201*
	(0.113)
CO2 Per Capita (log)	-2.796**
	(1.057)
GDP Current (Logged)	
GDP Per Capita Current (logged)	
GDP Constant (Logged)	15.398***
	(3.851)
GDP Per Capital Constant (logged)	-15.538***
	(4.383)
Fossil Fuel Rents (logged)	0.152
	(0.222)
Time	-0.059
	(0.043)
Observations	309
R^2	0.782
Adjusted R^2	0.754
Residual Std. Error (df = 273)	0.600
Note:	*p<0.1; **p<0.05; ***p<0.01

I run one robustness check for each model increasing the lag of the main independent variables (fossil fuel consumption, renewable electricity production and relative potential and world governance interaction) from one year to two years to check additional time delays in energy industry influence. Each independent variable in all previous models was lagged one year because we would expect the previous year's fossil fuel consumption or renewable electricity production to be a predictor of the following year of climate aid, not the current

year. This assumption is the same for the control variables. While a one-year lag is standard in the international relations literature, the policymaking process does not always exist in one-year cycles. Furthermore, there is likely a longer delay for emerging industry influence such as the renewable energy industry. Due to this possibility, I ran all original models lagging each main independent variables by two years and these results can be seen in figure 16. With the addition of the two-year lag for the independent variables, my results of my original models hold for H1 and H2 hold. The coefficients in each model change when a two-year lag is added. Fossil fuel consumption decreases from 4.788 in the original model to 2.61 in the model with a two-year lag and the coefficient for renewable electricity production increases slightly from 0.59 in the original model to 0.601 in the model with a two-year lag. With the addition of a two-year lag my results do not hold for H3. The interaction between relative potential and governance scores likely loses its significance because adding a two-year lag decreases sample size of the model and as previously discussed, interactions require more power to be significance. In addition, I run an additional robustness check that lags all independent and control variables in all models which can be seen in the appendix in figure A.23

Figure 16.

All Models with a 2 Year Lag for only Main IVs

	Dependent variable:		
	DV.ps.con.l		
	(1)	(2)	(3)
Fossil Fuel Consumption (% of total) (log)	2.611**		
	(0.943)		
Renewable Electricity Production (% of total) (log)		0.601**	
		(0.284)	
Relative Potential of Energy Consumption			-1.562
			(1.002)
World Governace Indicators	0.168	0.236	0.020
	(0.141)	(0.154)	(0.156)
CO2 Per Capita (log)			0.167
			(0.182)
GDP (log)	-1.686	-0.752	-0.545
	(1.109)	(1.018)	(1.215)
GDP Per Capita (log)	16.663***	16.935***	14.611***
	(4.581)	(3.982)	(4.948)
Time	-17.214***	-17.890***	-15.701***
	(5.087)	(4.327)	(5.597)
Relative Potential and World Governance Interaction			
			0.165
			(0.122)
Observations	282	282	253
R^2	0.772	0.780	0.763
Adjusted R^2	0.741	0.751	0.727
Residual Std. Error	0.590 (df = 248)	0.579 (df = 248)	0.582 (df = 219)
Note:			*p<0.1; **p<0.05; ***p<0.01

Finally, as discussed previously, in the literature climate aid is operationalized in multiple different ways, and so I test each of my three hypotheses using different operationalization of my dependent variable. The results can be seen in figures A.24, A.25 and A.26 in the appendix. In all three figures Model 1 is the original model for comparison. In all three figures the dependent variables are; in Model 2 total climate aid per GDP, in Model 3 total climate aid per GDP per capita, in Model 4 total climate aid in absolute dollars with aid categorized as having a significant climate goal and not a principle climate goal being

discounted at 50%, and in model 5 total climate aid as a proportion of total ODA with aid categorized as having a significant climate goal and not a principle climate goal being discounted at 50%. Across all three hypotheses, when changing the dependent variable's my results overall remain unchanged.

5.5 Results Conclusion

The findings of this dissertation show that the energy sector does have an impact on the amount of climate aid donor states contribute. While this research does not show a causal link, it has found significant relationships between the fossil fuel industry, the renewable energy industry and the relative potential of the renewable energy industry and climate aid. Fossil fuel energy consumption is positively correlated with climate aid, which is contradictory to the theoretical expectations. Despite this, the relationship is highly statistically significant, which indicates there is some connection between the two and this connection provides ample opportunities for future research. Renewable electricity production is correlated with increasing climate aid as expected, which illustrates how domestic economic interests do have a stake in climate aid choices and are likely attempting to influence the decisions on donor states. Finally, when the renewable energy industry has a higher relative potential compared to the fossil fuel industry, there is a corresponding increase in climate aid, but only when the renewable energy industry is operating in a state with strong democratic institutions. This suggests that to increase climate aid, we not only need to bolster the renewable energy industry within donor states, but also work to maintain and strengthen democratic institutions within them.

6 Conclusion

In 2022, at the 27th Conference of the Parties to the UNFCCC in Sharm el-Sheik Egypt, over 190 countries agreed to create a loss and damages fund to help poorer countries recover from climate change induced disasters. The details of this fund have not yet been decided, but this is an important move by the international community because it formalizes the current voluntary bilateral assistance climate aid mechanism. However, fundamentally, the drivers of contributions to international climate aid, be it via a formal fund or via bilateral assistance, remain unchanged and will continue to reflect the preferences of donor countries. In a world of limited resources, what are the politics behind how money is allocated to combat climate change in the international system? What determines how much donors prioritize and contribute to climate aid?

The findings of this dissertation suggest that domestic economic interests in donor states have material consequences for how much aid is allocated and the domestic institutions of donor states play a role in determining how much a state contributes. Specifically, donor states that are home to domestic renewable energy industries that are growing economic contributors, estimated as the share of national electricity produced, will contribute more to climate aid. Furthermore, domestic institutions play an important role in this. When a donor state has particularly strong domestic institutions, and the renewable energy industry has greater potential to be a major energy provider as compared to the fossil fuel industry, the donor state will give more to climate aid. In contrast, when a donor state has particularly weak domestic institutions, they will give less to climate aid regardless of the potential of the renewable energy industry. The findings of this dissertation suggest that climate aid becomes

a greater priority for states when they have a stronger renewable energy industry and strong domestic institutions. The following sections of this conclusion will address how these findings are significant to theory and policy, the limitations of the current research, and outline possibilities for future research that respond to these limitations.

6.1 Research Contributions to Theory and Policy

This dissertation has important implications for theories of climate aid, as well as for efforts aimed at increasing climate aid in the future. First, the findings of the dissertation illustrate how theories of climate aid should consider domestic interests and institutions in recognition of the transformative potential of climate aid, which sets it apart from other types of foreign aid. This dissertation contributes to the literature on climate aid by opening the black box of states and considering the role of the energy industry and domestic institutions can play in the allocation of climate aid. Building from IPE literature, this dissertation adds to climate aid theory by analyzing how domestic interests and domestic institutions can shape the policy preferences of donors regarding climate aid. This is an important theoretical contribution because much of the climate aid literature thus far has largely excludes these factors. Studies on climate aid have considered the size of the carbon-intensive industry within donors (Peterson 2022), the role of political parties in power (Halimanjaya & Papyrakis 2015; Klock et al 2018), donors climate vulnerability (Klock et al. 2018; Peterson 2022), and other domestic characteristics of donors. Yet, no study has considered the impact of the renewable energy industry.

The findings of this dissertation suggest that theories of climate aid should not only consider industries that will be negatively impacted by policy decisions, but also those that will benefit from these policies and how the composition of these actors can shift over time.

Furthermore, it is important to consider the shifting economic dynamics within countries. Despite the fossil fuel industry dominating the energy sector in most countries for decades, the entrenchment of this industry does not result in their influence perpetually clouting out competitors. The renewable energy industry is becoming increasingly important to state economies. New technology development and new investment in renewables is likely to shift the energy landscape and thus continue to change the power dynamics within countries. This dissertation shows why time-series analysis is important to understanding shifting trends of climate aid.

Domestic interests play a pivotal role in climate aid due to the unique challenge posed by climate change. If successful, climate aid is likely to help transform the global economic system. Therefore, it is important to research how impacted economic actors are responding to this challenge. Climate aid research must thus move beyond foreign aid research, which tends to focus on strategic political and economic drivers of aid. These remain important drivers but need to be considered alongside the influence of specific economic actors with vested interests in the outcomes of climate aid. The energy industry has a direct stake in the outcomes of climate aid because some of the goals of climate aid are to lower CO2 emissions and foster more sustainable energy systems. But there is variation in the composition of the energy industry across donor states. Some states have a burgeoning renewable energy industry with the potential to become major energy sources in the future, while other states continue to rely mainly on fossil fuels. Moreover, climate aid is likely to positively impact the renewable energy industry, while the reverse is true for the fossil fuel industry, therefore their interests must be taken into account in climate aid research.

Another key contribution of this dissertation is its analysis of domestic institutions. The results suggest that the domestic institutional context moderates the ability of domestic interests to exert influence on their governments. The processes of economic interest influence are more complex than previous studies have considered. Opening the black box of donor's climate aid choices requires analysis of the structures that shape the power of industry. Domestic institutions structure the influence of interest groups, because they function as a filter for how domestic preferences are aggregated to influence foreign policy choices. Variation in institutions will result in variation in which groups are given a voice and/or a seat at the policy making table. When governments are effective and legitimate, they are less likely to be captured by narrow entrenched interests of the old and powerful and more likely to give voice to new and emerging industries, if these new emerging industries have the potential to be successful. Domestic institutional differences are not only important for recipients of aid, but also important for how much aid donors provide.

This dissertation also has important policy implications for the future of climate aid. The findings show an association between higher renewable electricity production and more climate aid; this suggests that to increase prioritization of climate aid within a state, governments should implement policies that help grow the renewable energy industry within their state. Furthermore, if a donor state has a strong renewable energy industry, providing more climate aid will may provide economic benefits to the donor because recipients attempting to transition to more sustainable energy will likely use the climate aid, they receive to purchase renewable technology from donors. Research suggests that foreign aid has been used to foster domestic markets. In the case of the Montreal Protocol, domestic economic interests supported providing aid to multilateral aid institutions when these groups were likely

to gain from the aid due to their comparative advantage (McLean 2015). Similar logic can be applied to the understand why governments should support and invest in their renewable energy industries to achieve long-term economic gains. Smart and strategic investment in their domestic renewable energy industry could result in a comparative advantage for this industry internationally which will ultimately result in future economic gains for climate aid donors with a strong renewable energy industry.

A second policy implication is that states should utilize the potential of their renewable energy industries in discussions of climate aid at international climate summits. Industry actors have historically been present at international summits and lobby for their interests (Pulver 2005; Coen 2005; Falkner 2008; Orsini 2011). The renewable energy industry stands to gain greatly from formal climate aid agreements and because of this governments should actively bring them into international climate aid discussions. International agreements need to be accepted on the international level and then ratified domestically. If domestic renewable energy industries are involved in deliberations of international climate aid, it is more likely that agreements will be made that benefit them and thus provide economic benefits to both the industry and the donor states involved.

Finally, this research shows the importance of maintaining strong domestic institutions. In recent years we have seen democratic backsliding across the globe, including in advanced developed democracies (Waldner & Lust 2018). This analysis showed that there has been a downward trend in governance scores for many climate aid donors. This is problematic for the future of climate aid because donors with particularly weak institutions do not provide as much climate aid, even when they have a renewable energy industry that is growing at a faster rate than their fossil fuel industry. The weakening of institutions in many donor states could

undercut the promise of the growing renewable energy industry. Therefore, donors need to not only bolster their burgeoning renewable energy industries, but also work to improve or maintain their domestic institutions.

6.2 Limitations & Future Research

The research done for this dissertation has multiple limitations, but each limitation provides opportunities for future research that can improve our understanding of the dynamics driving climate aid. First, this research lacks a direct measure of the influence of energy industries within each state and instead relies on proxies that may not accurately represent the power of each industry. Future research could utilize in-depth case studies of a few donor states to more directly investigate the extent to which these energy industries attempt to influence donors' climate aid decisions. Second, this research only begins to open the black box of donor states. Future research needs to extend the scope of domestic factors that are likely to influence climate aid decisions. Third, the sample of this research is limited in the number of countries included and the timespan considered. Future research should investigate other donors outside of OECD countries and study how the climate aid landscape has shifted after the Pairs Climate Accords. Finally, this dissertation is limited in its scope to understanding what drives donor states to prioritize climate aid over other types of aid, but future research should seek to understand when and under what conditions is climate aid most effective. Future research should expand our knowledge on climate aid conditionality.

Due to data challenges, this dissertation was not able to operationalize influence of the fossil fuel or renewable energy industries directly but instead used proxy variables based on observable implications. This is a major limitation because renewable electricity production and consumption of fossil fuels is not likely to translate directly into influence. The ability of

interest groups to influence government decisions varies across states due to multiple factors. One of which is domestic institutions which this research did consider using a measure of governance scores, but this measure is also a proxy for domestic institutions. More nuanced and direct measures are required to have a complete understanding of the dynamics of influence through which each energy industry may be able to exert on their governments.

Future research can overcome this limitation to some degree by pursing a case study approach that focuses on countries that monitor lobbying. Data on industry lobbying is limited because only 22 countries in the world have any laws on reporting lobbying activities and many of these laws are limited (Sunlight Foundation 2016). Though, some countries have more transparency of lobbying activities than others and may be good candidates for future case studies. For example, Austria, Germany, and Spain have some degree of lobbying transparency in all three branches of government, the legislature, the executive, and the judiciary (OECD 2020). Due to The Lobbying Disclosure Act, the United States may also be a possible candidate for a case study on lobbying activities.

This ties into a second limitation major limitation of this research. This dissertation only opens the black box of states partially. While it is impossible and not methodologically sound to include every domestic factor that varies across states, there are still some important factors that are likely to influence the prioritization of climate aid that this dissertation was unable to include. For example, the process through which aid decisions are made varies across states. Each state has different agencies in charge of foreign aid. Furthermore, each has a different governmental process in approving the amount of aid, the recipient of the aid, and which projects to fund. Case studies would also be useful to understand these processes more fully. Case studies of this nature should investigate the agencies, bureaucratic structure and

government processes involved in aid decisions because these factors are likely to play a role in climate aid prioritization.

The sample used in this dissertation was limited to 28 OECD countries. This is an important limitation because OECD countries are not the only countries contributing to climate aid. For example, China and Saudi Arabia are also contributors to climate aid but their climate aid contributions are not systematically tracked by the OECD CRS. Despite this, less systematic data can be found outside of the OECD CRS. Future research on these donors would be valuable to further our understanding of the drivers of climate aid for multiple reasons. First, all the OECD countries considered in this dissertation are democracies. What drives climate aid contributions in autocracies is likely to differ greatly. Furthermore, China is a major player in international development finance with their belt and road initiative. China's motives and role in climate finance is likely to be an important factor in the makeup and politics of climate aid in the future.

In addition, the sample used in this dissertation only covers the years between the Kyoto Protocol entering into force and the signing of the Paris Climate Accords, but climate aid has become a topic increasingly discussed at international climate summits in recent years. Climate aid up to this point has been voluntary, but pressure for increasing the amount of climate aid has been increasing from developing countries. At the two most recent COPs in Glasgow and Sharm El Sheikh, financing climate solutions for developing countries was a major topic of discussion and while no formal mechanisms came out of either conference, the demands for increasing climate aid are unlikely to abate in subsequent COPs. Future research on the climate aid post-Paris will be important to gain a better understanding of the current landscape of

climate aid and how climate aid can be increased to meet the dire challenges of climate change in the coming decades.

Finally, the purpose of this research is to better understand what determines how much donors contribute to climate aid because adequate financing is necessary for developing countries to withstand the impacts of climate change. Climate change is a problem that will impact all countries of the world and the poorest countries are the least equipped to deal with its devastating consequences. Because of this future research should also do more to understand how to make climate aid most effective. The foreign aid literature suggests that conditional aid is the most likely to be effective. Donors can increase the effectiveness of climate aid by adding conditions to aid, creating dependency relationships, and increasing the shadow of the future, where aid relationships are extended beyond one transaction into multiple exchanges. Extending aid in this way will make the relationship more valuable to both parties and makes it more likely for both the donor and recipient to maintain a good relationship in future aid transactions.

More research needs to be done to analyze the conditions attached to climate aid and investigate what conditions are most successful in achieving ideal outcomes. Donors can require recipients to use their aid to buy renewable energy infrastructure. This conditionality will ensure that climate aid is used to an end that will reduce CO2 emissions. Furthermore, this will also create dependency between donors and recipients. Recipients will become dependent on donors to provide them with renewable energy technology and the manufactured components required to build sustainable energy. In turn the donors will become dependent to some degree on recipients to purchase these items from them which will further strengthen their renewable energy industry. Ultimately this type of relationships will increase the shadow

of the future and increase the effectiveness of aid because aid has been shown to be most effective when there is no expiration date attached to the aid (Drezner 1999). Increasing the amount of climate aid donors give is critical because overcoming the challenges climate changes poses is going to be expensive and well beyond the means of developing countries. But perhaps more important is ensuring that the aid that is given is effective.

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Appendix

Figure A. 1

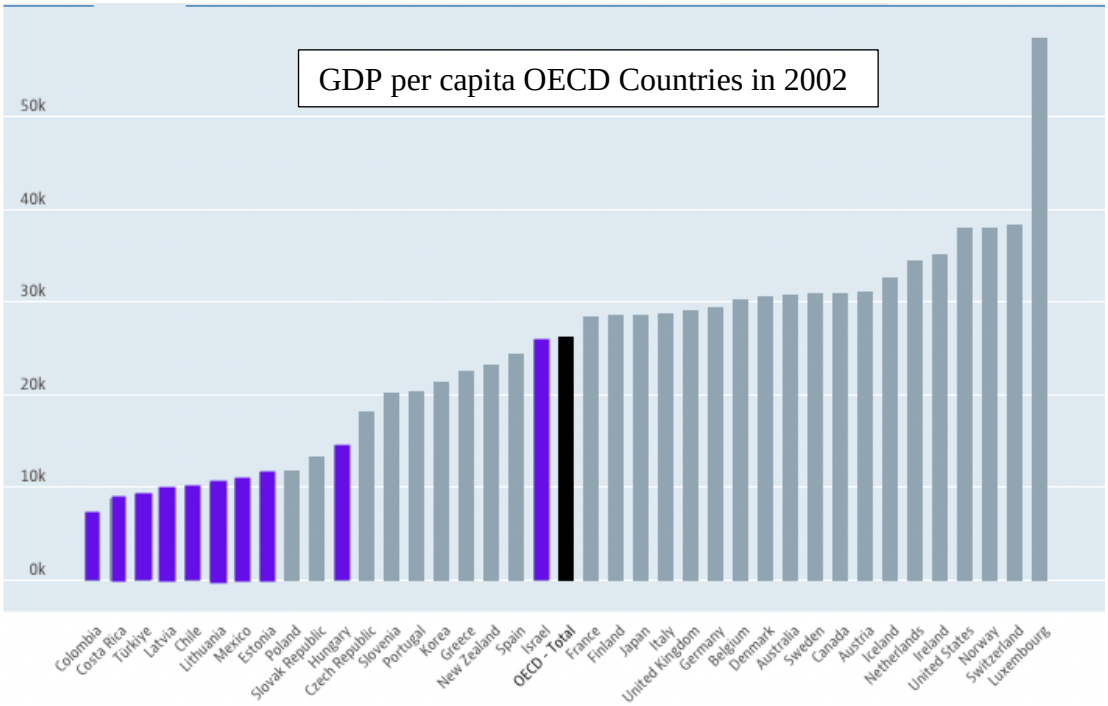


Figure A.2

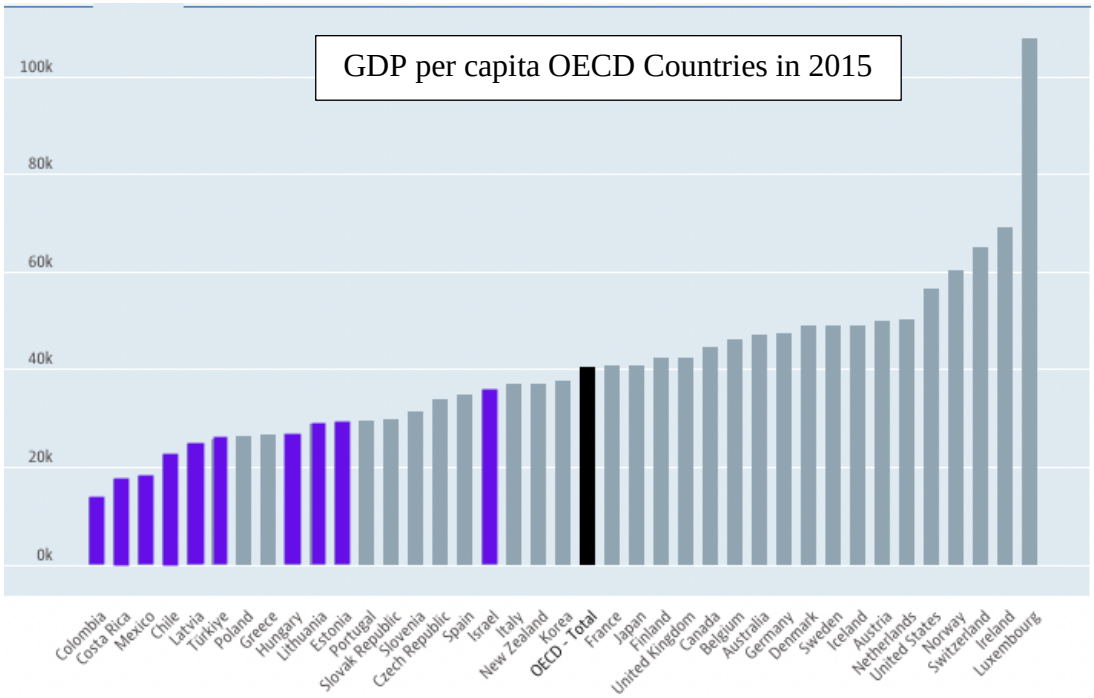


Figure A.3

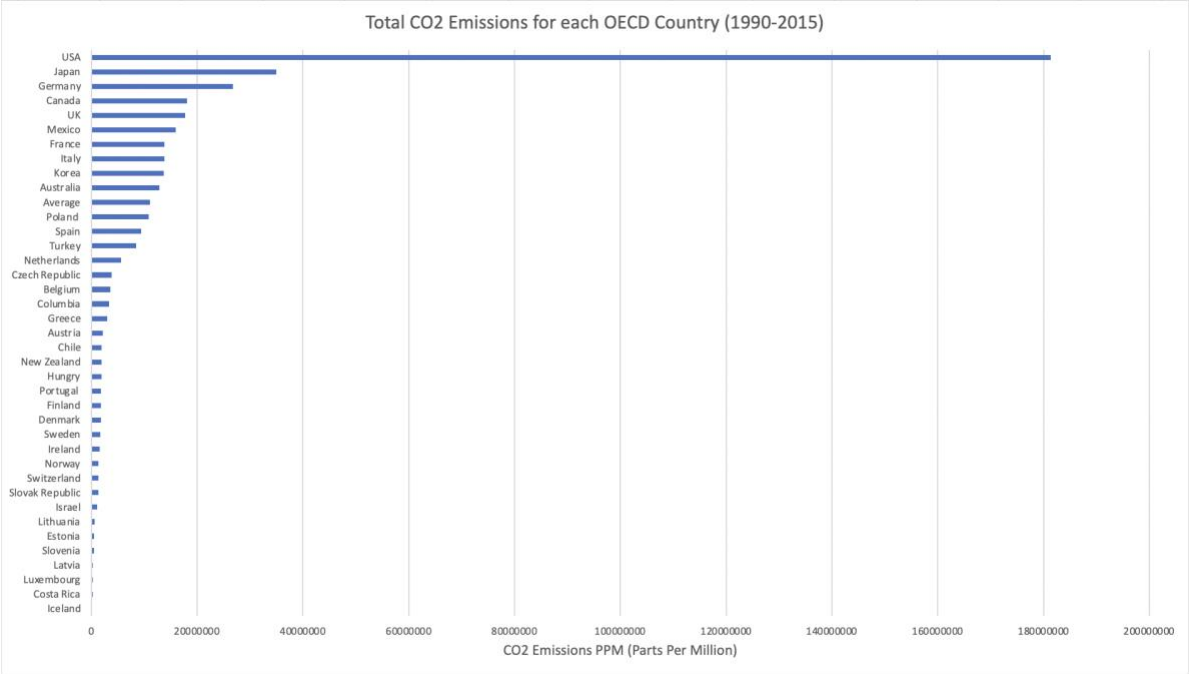


Figure A.4

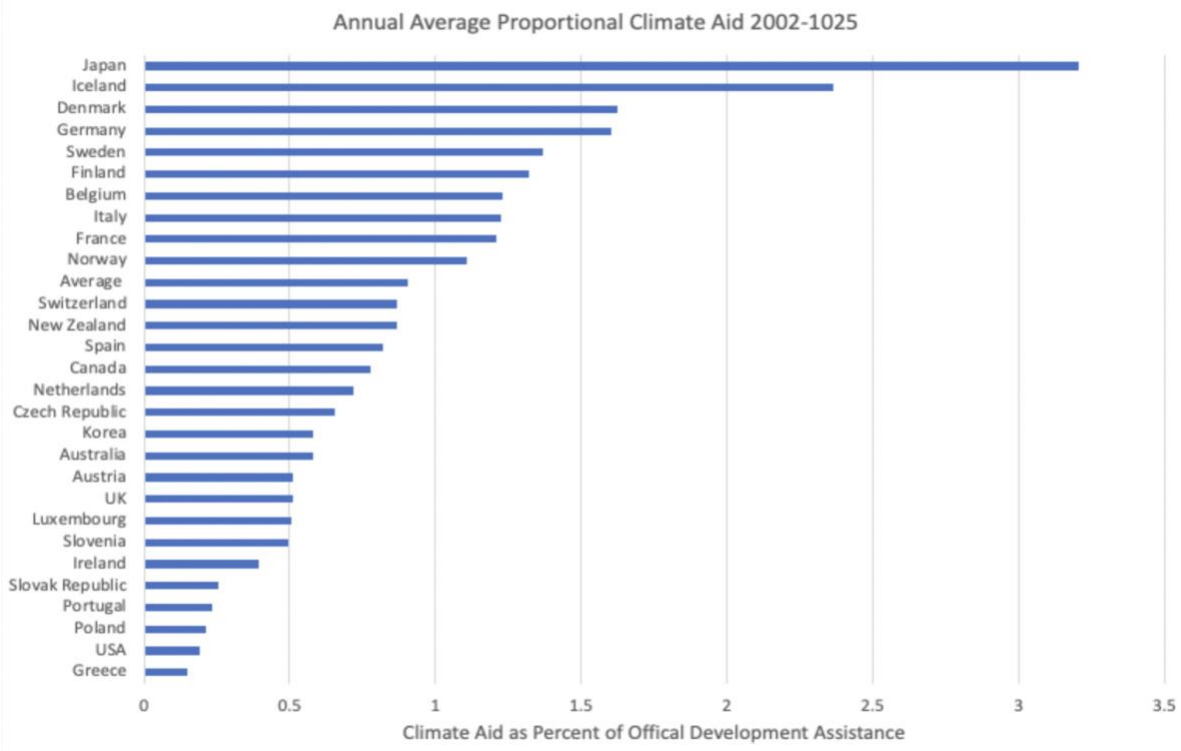


Figure A.5

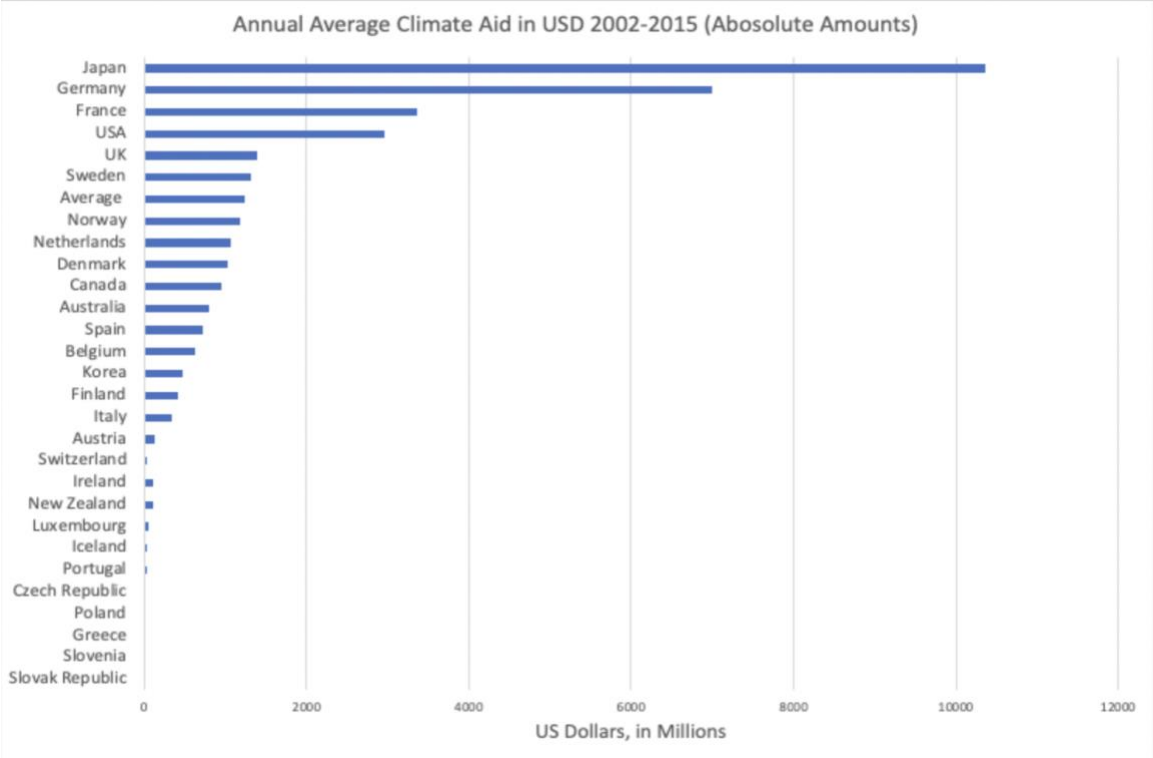


Figure A.6

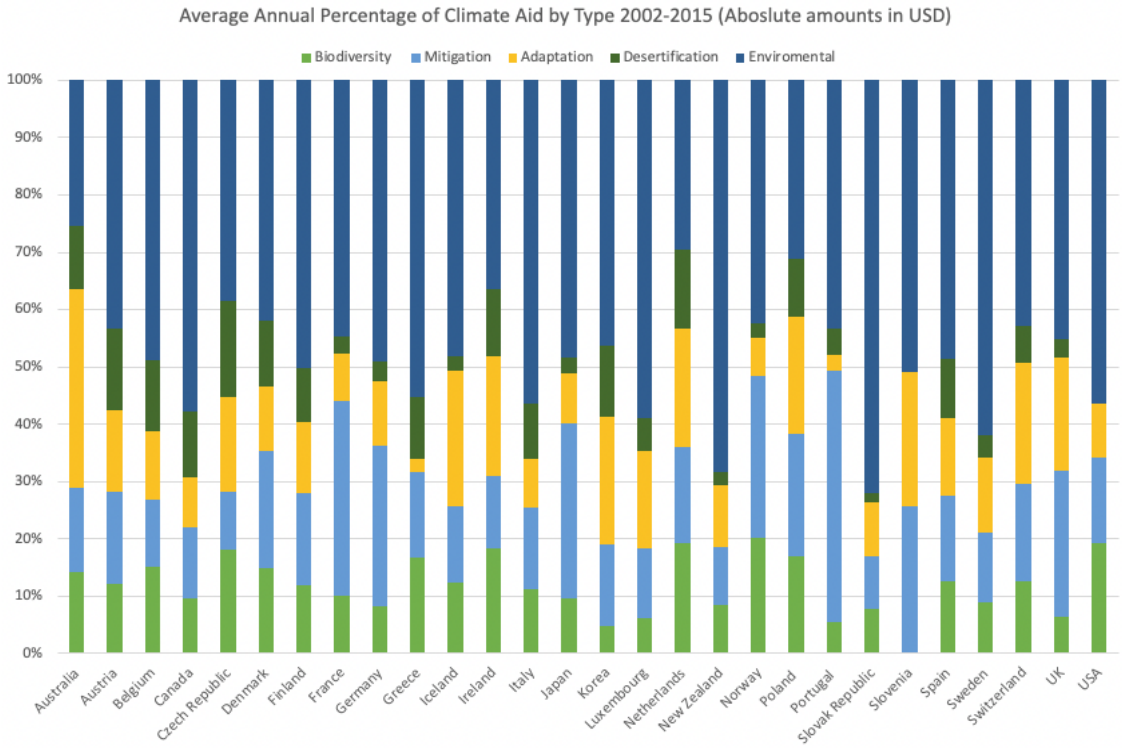


Figure A.7

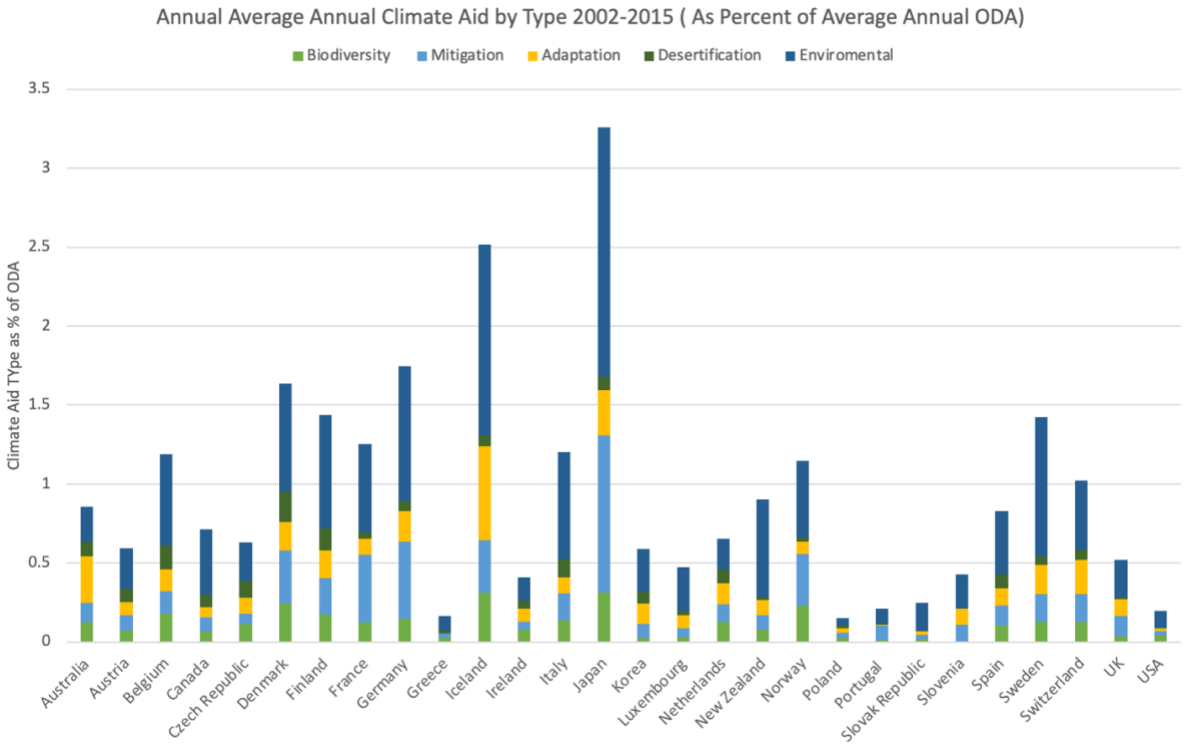


Table A.1

Descriptive Statistics on Fossil Fuel Energy Consumption (% of total consumption)

Mean	73.66%
Median	79.57%
Max	95.89%
Minimum	10.25%
3rd Quartile	86.85%
1st Quartile	63.98%

Figure A.8

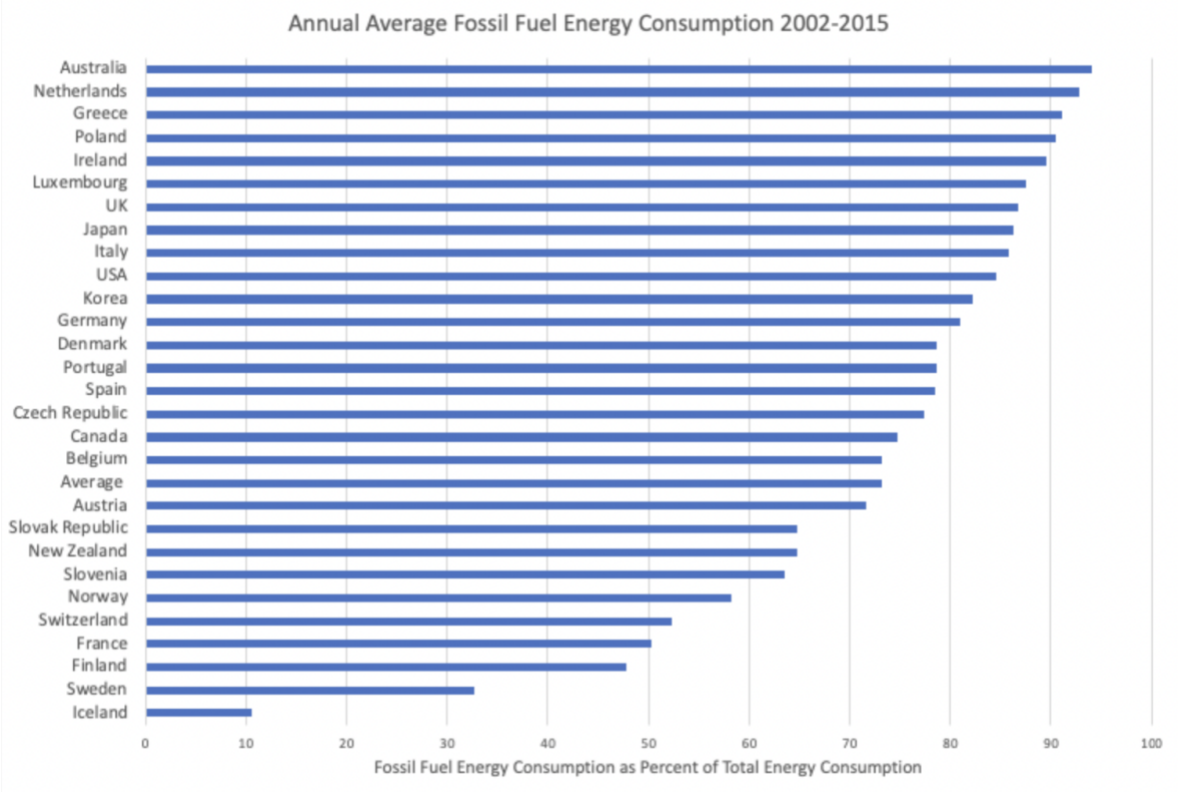


Figure A.9

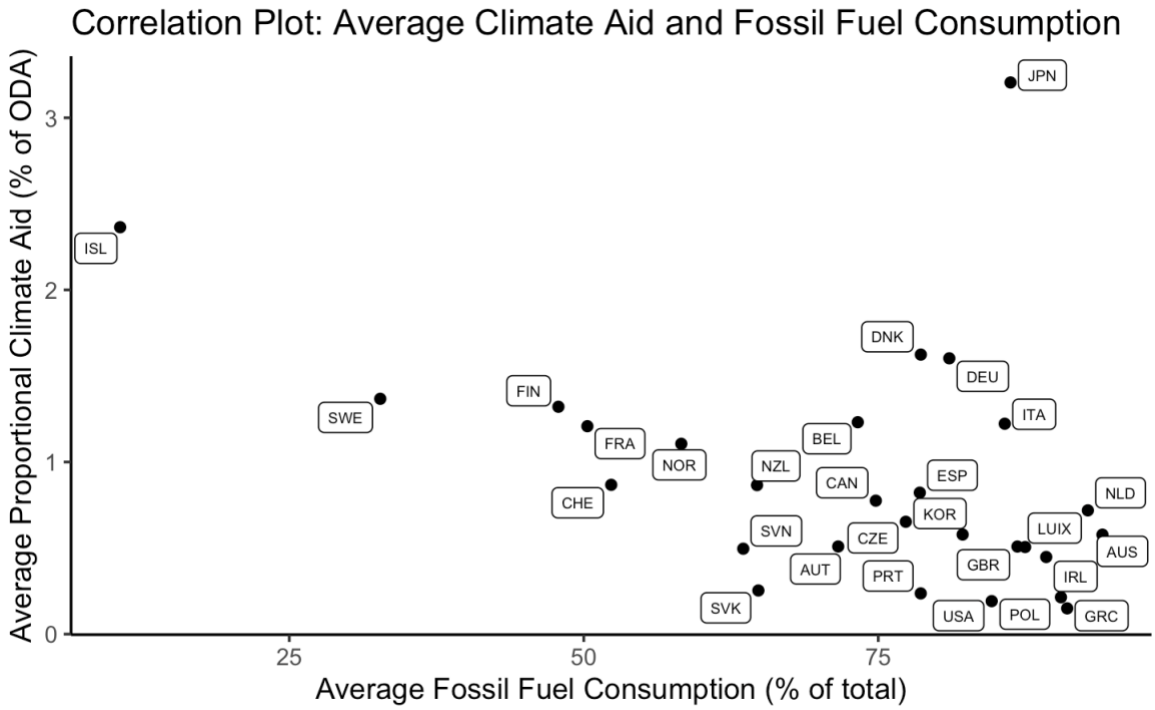


Figure A.10

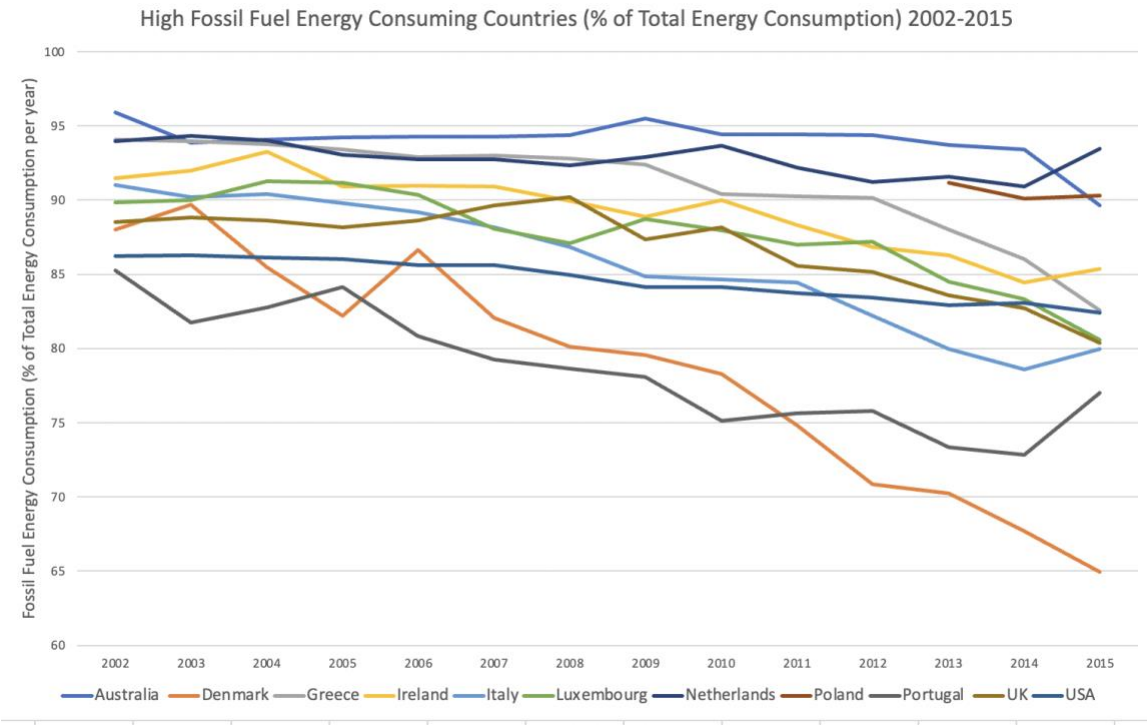


Figure A.11

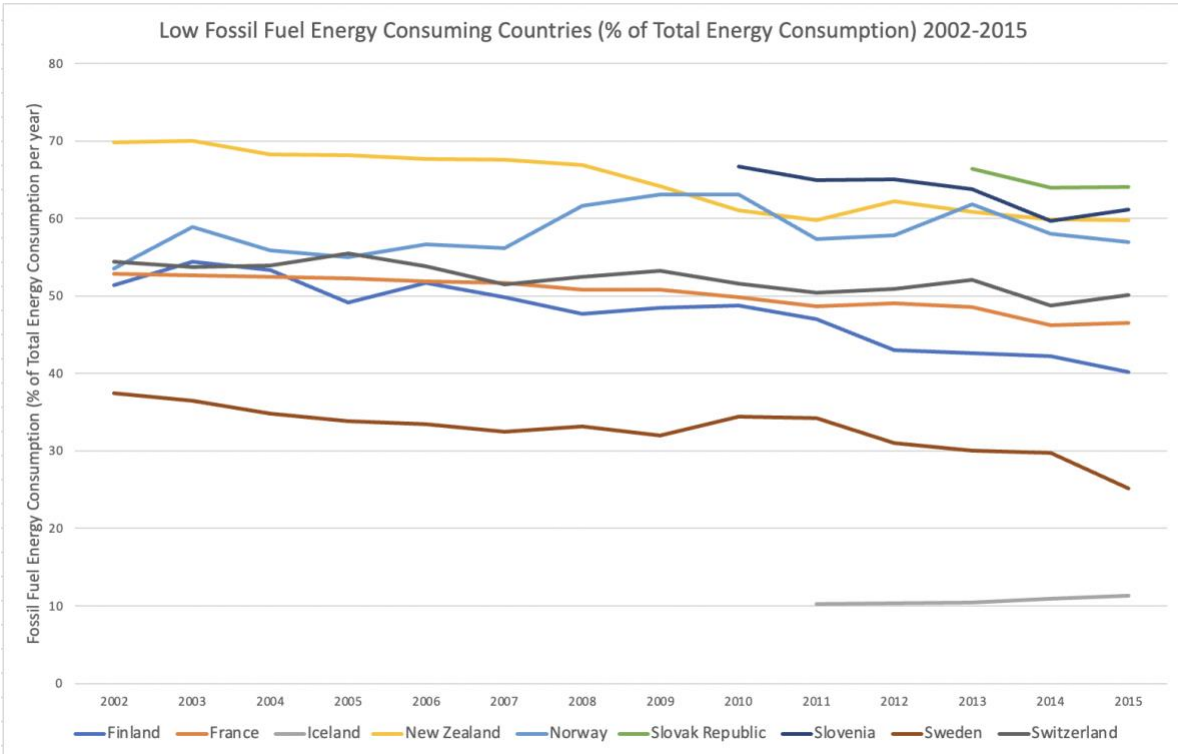


Table A.2

Descriptive Statistics on Renewable Electricity Production (% of total production)

Mean	9.28%
Median	6.04%
Max	65.44%
Minimum	0.14%
3rd Quartile	12.88%
1st Quartile	2.62%

Figure A.12

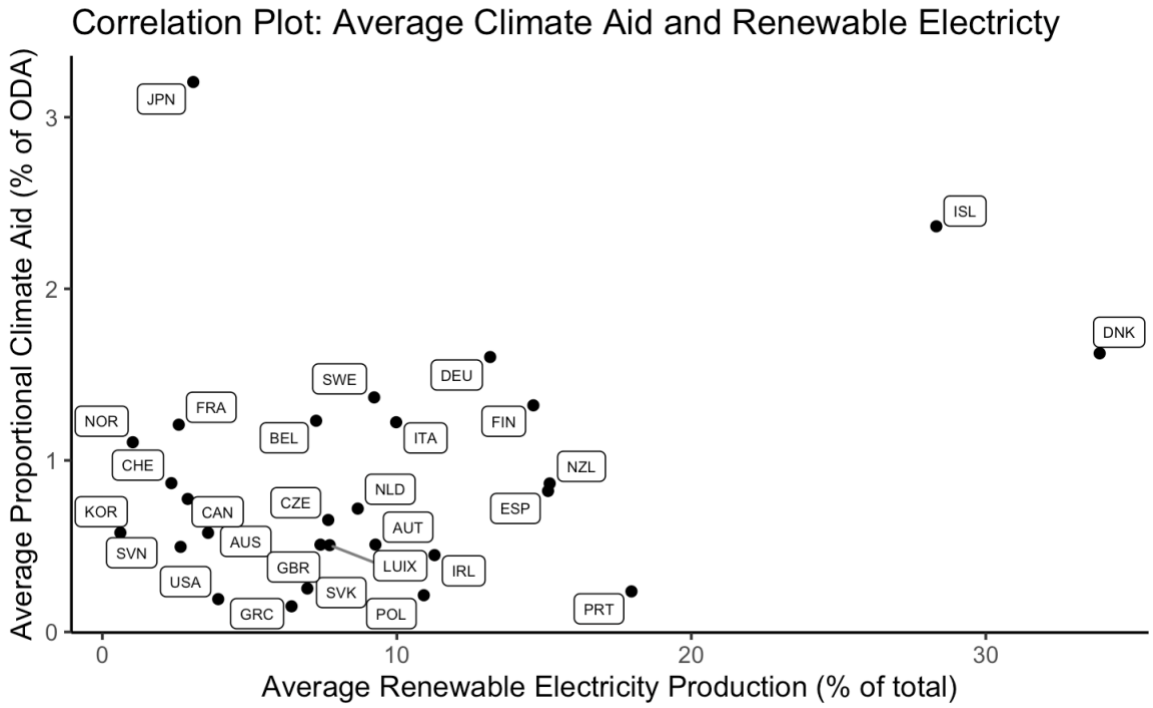


Figure A.13

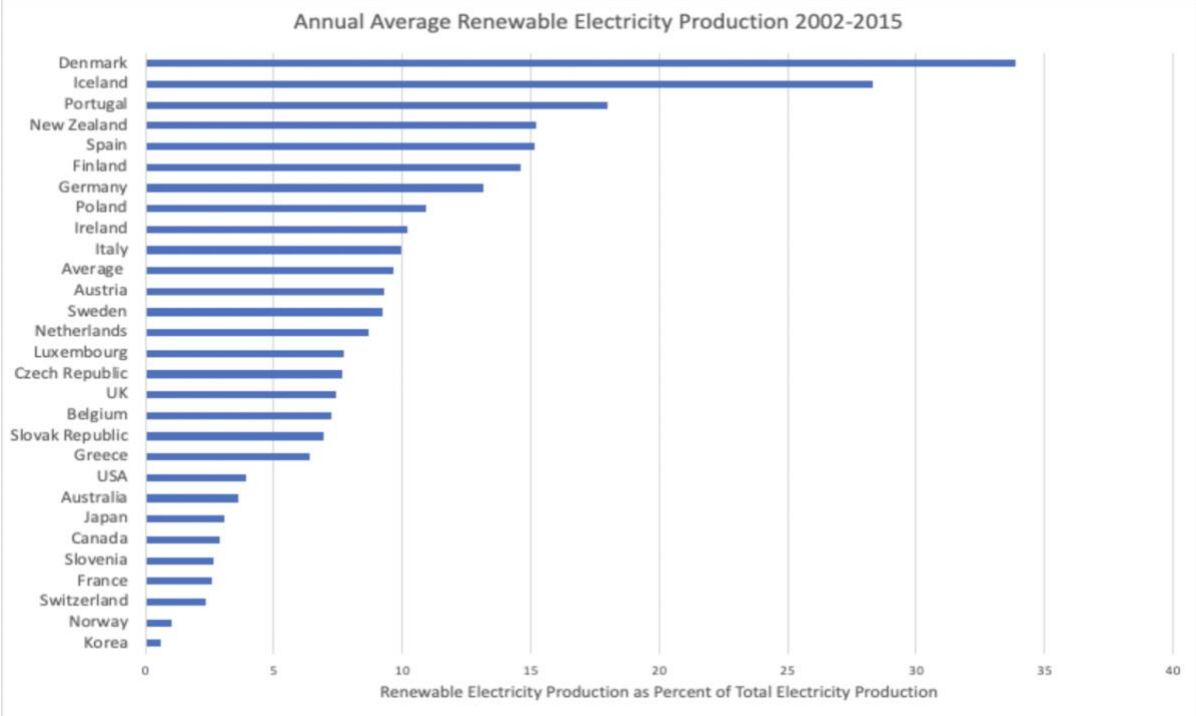
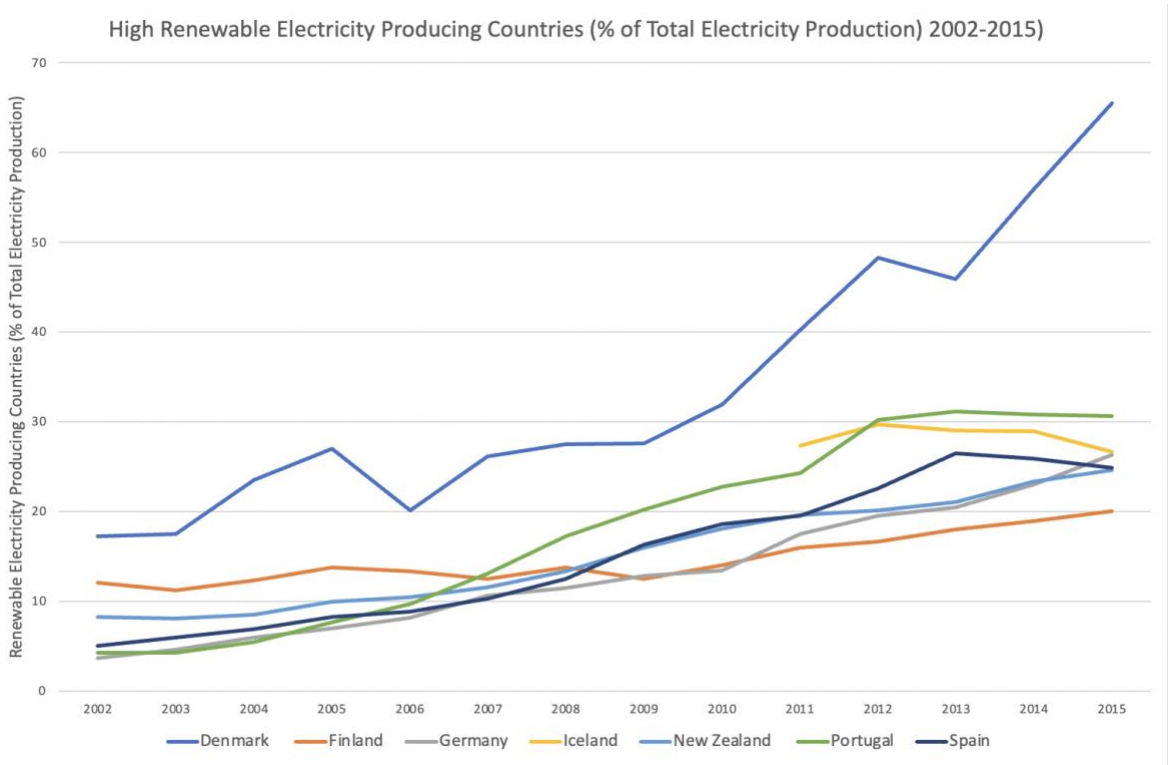


Figure A.14



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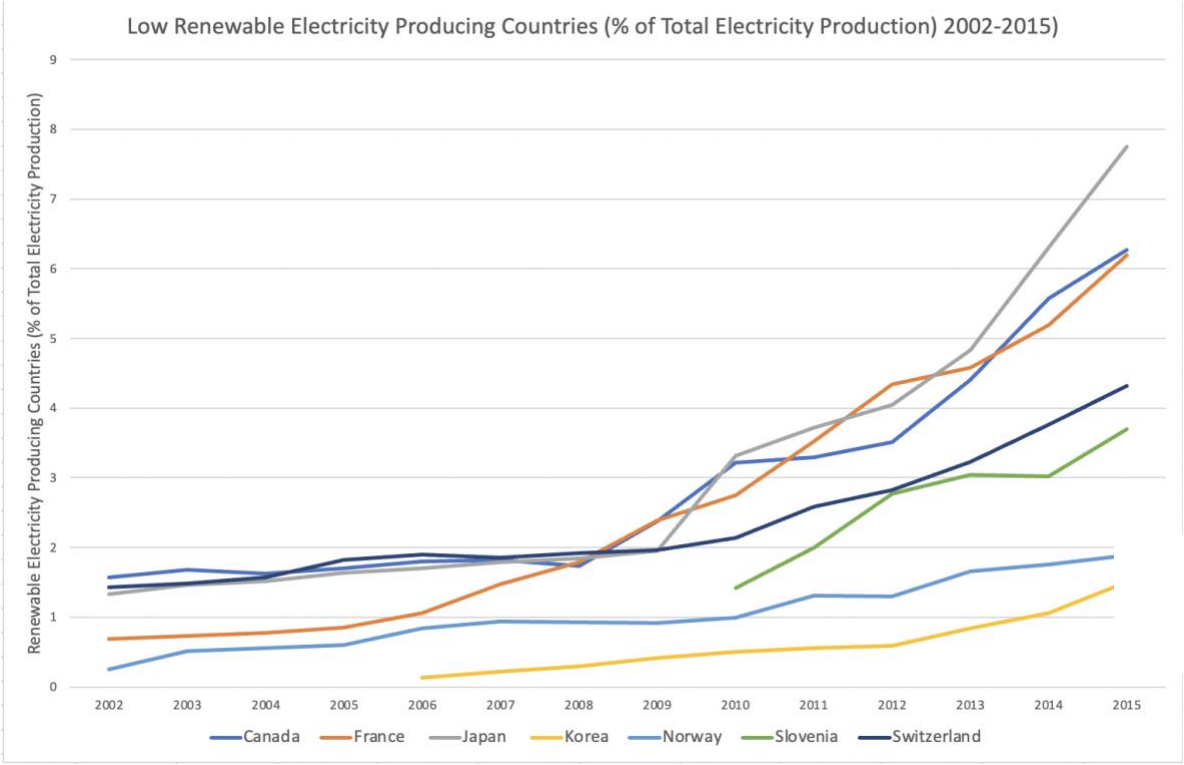


Figure A.16

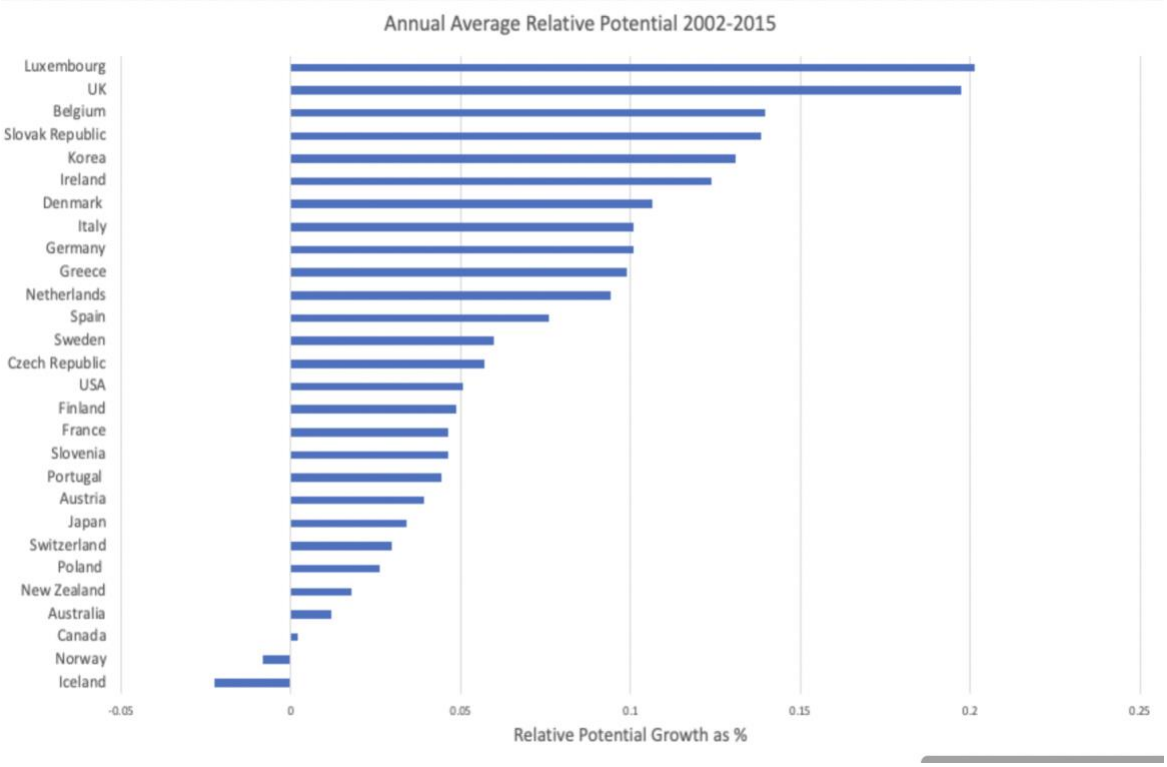


Figure A.17

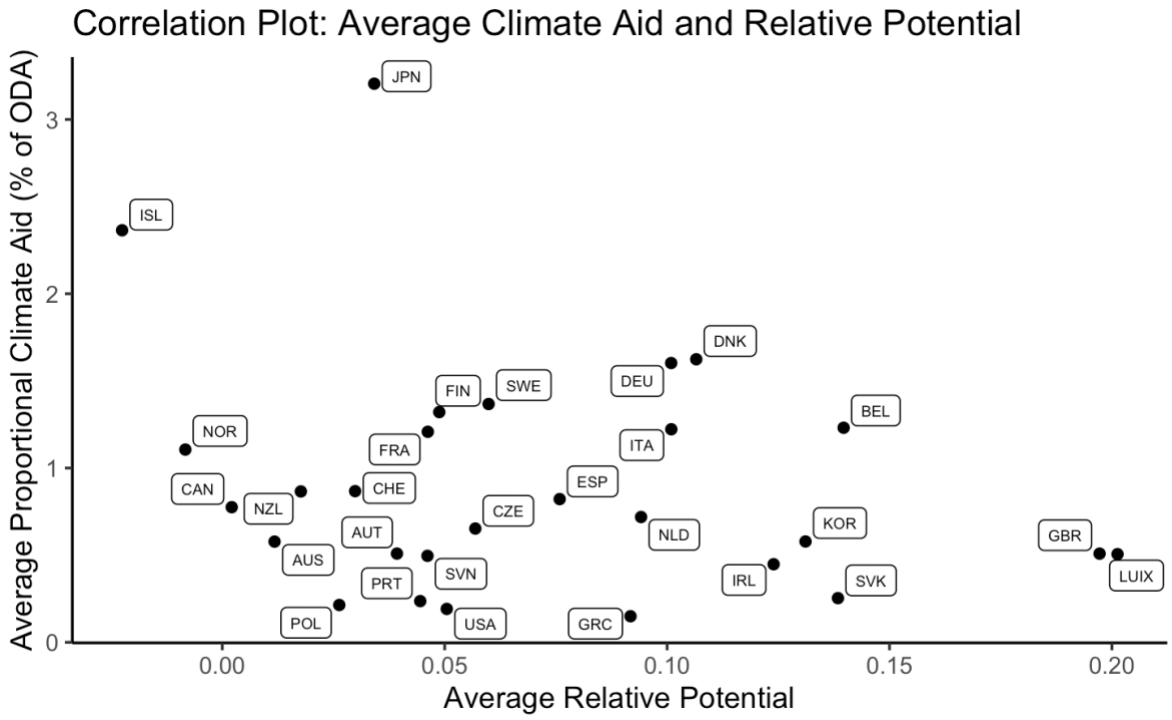


Figure A.18

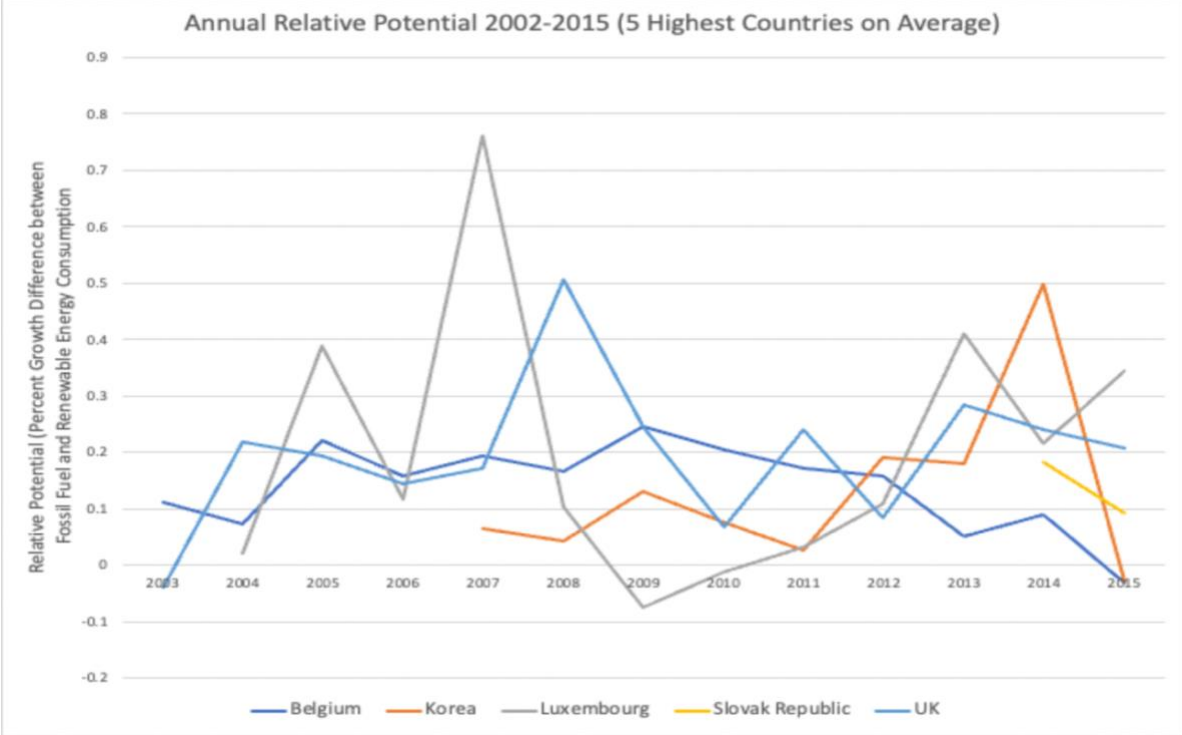


Figure A.19

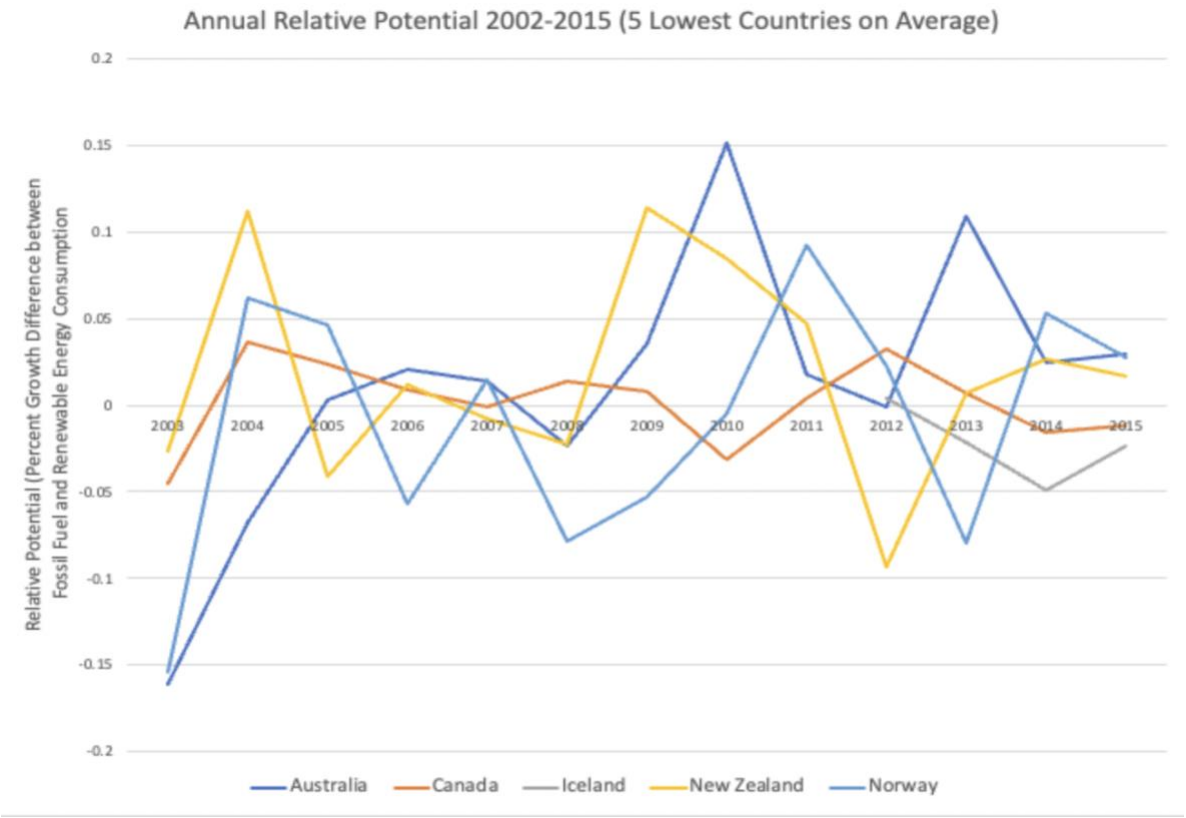


Table A.3

Descriptive Statistics on Relative Potential

Mean	0.073
Median	0.058
Max	0.762
Minimum	-0.166
3rd Quartile	0.134
1st Quartile	0.005

Figure A.20

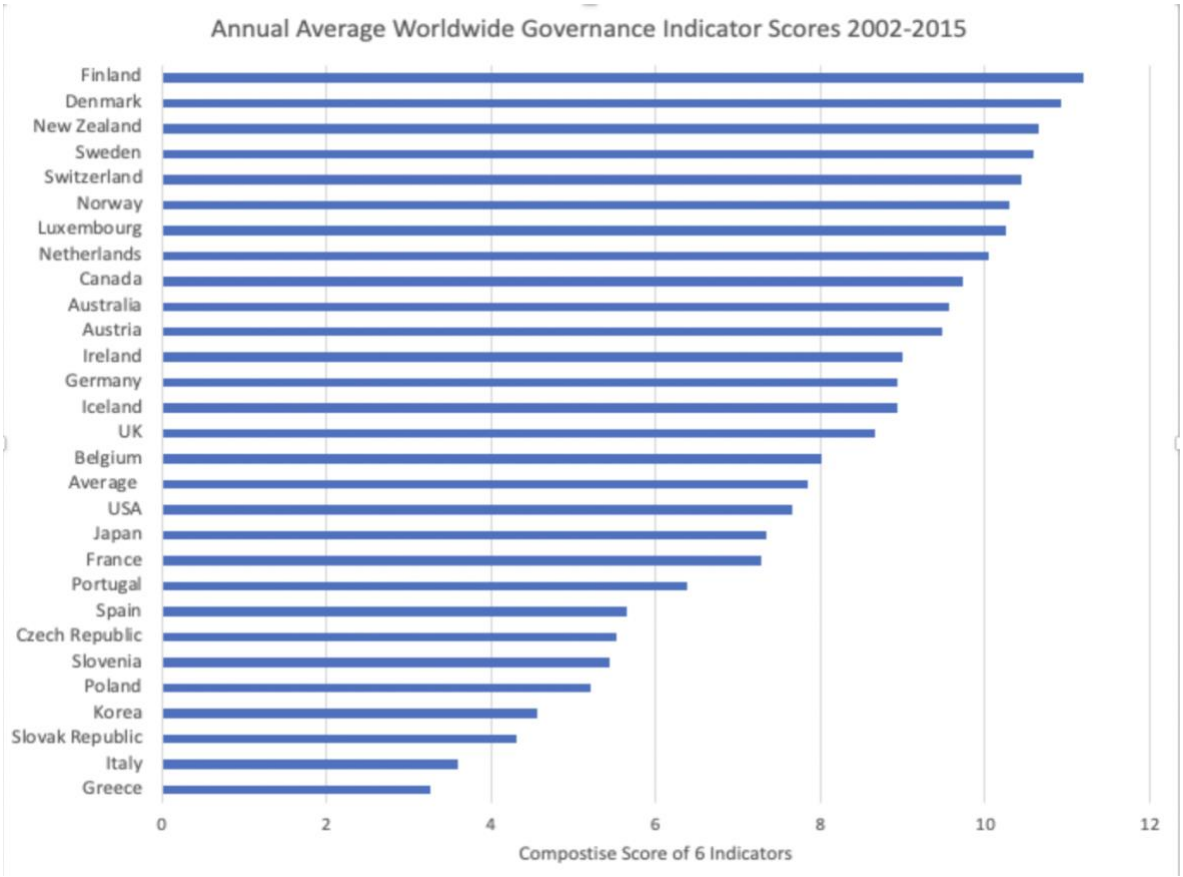


Table A.4

Correlations between different measures of the Fossil Fuel Industry

	Fossil Fuel Consumption (% of total)	Fossil Fuel Electricity Production (% of total)	Fossil Fuel Rents
FF Energy Consumption	1	0.77	0.2
FF Electricity Production		1	0.03
Fossil Fuel Rents			1

Figure A.21

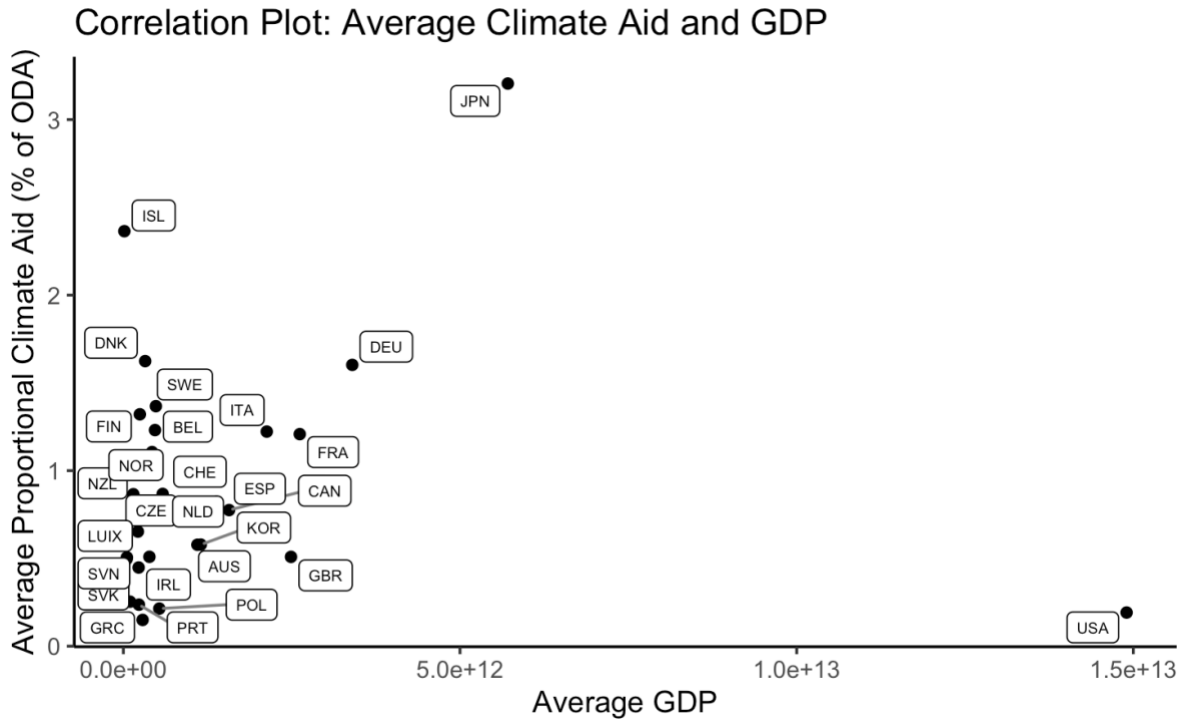
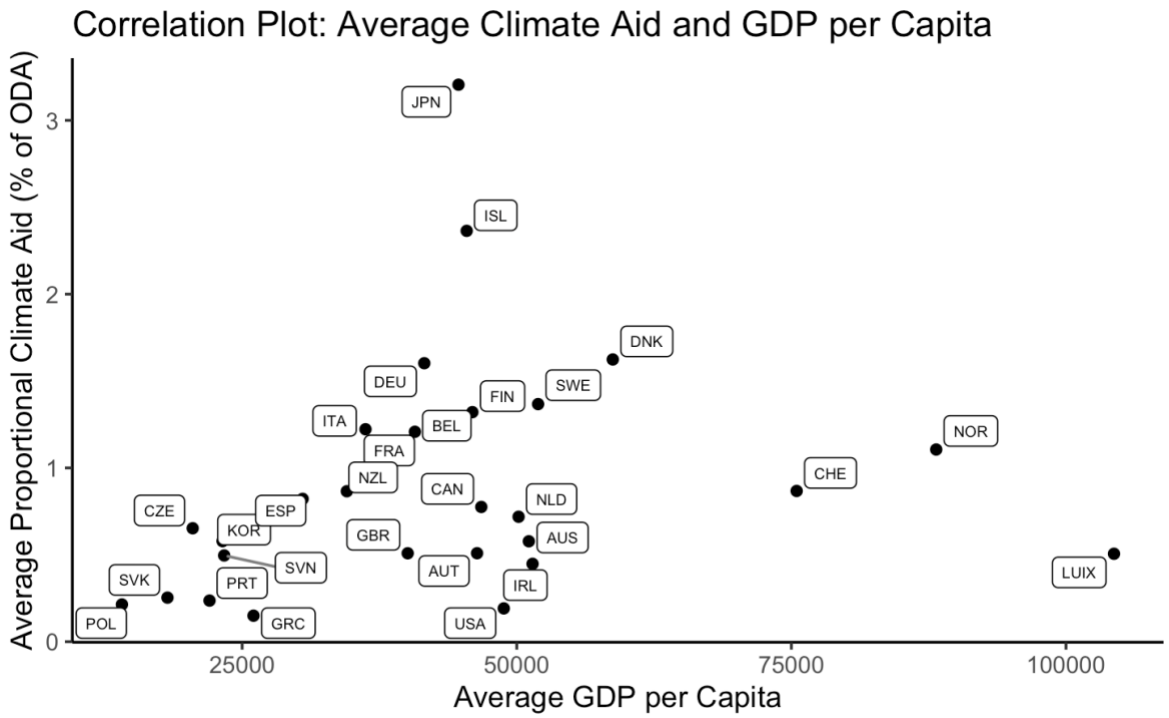


Figure A.22



A.23

All Models with a 2 Year Lag for all Variables

	Dependent variable:		
	DV.ps.con.l		
	(1)	(2)	(3)
Fossil Fuel Consumption (% of total) (log)	4.594***		
	(1.383)		
Renewable Electricity Production (% of total) (log)		0.587*	
		(0.293)	
Relative Potential of Energy Consumption			-0.549
			(1.109)
World Governace Indicators	0.122	0.184	0.171
	(0.133)	(0.142)	(0.151)
CO2 Per Capita (log)	-3.167**	-1.016	-1.337
	(1.154)	(1.016)	(1.114)
GDP (log)	16.600***	17.149***	14.966***
	(4.390)	(3.960)	(4.994)
GDP Per Capita (log)	-14.095***	-15.656***	-13.165**
	(4.531)	(4.007)	(5.305)
Time	-0.009	-0.075	0.017
	(0.038)	(0.055)	(0.042)
Relative Potential and World Governance Interaction			0.034
			(0.136)
Observations	282	282	253
R^2	0.778	0.782	0.768
Adjusted R^2	0.749	0.753	0.734
Residual Std. Error	0.582 (df = 248)	0.577 (df = 248)	0.575 (df = 220)
Note:			*p<0.1; **p<0.05; ***p<0.01

A.24

Climate Aid DV Comparison & Fossil Fuel Consumption

	Dependent variable:					
	DV.ps.con.l	CA.GDP.l	CA.GDPPC.l	CA.pop.l	DV.discount.ab.l	DV.discount.prop.l
	(1)	(2)	(3)	(4)	(5)	(6)
Fossil Fuel Consumption (% of total)	4.788***	0.00001*	4.883***	4.245***	4.690***	5.383***
	(1.028)	(0.00000)	(1.150)	(1.150)	(1.270)	(1.136)
World Governace Indicators	0.132	0.00000***	0.097	0.252	0.211	0.084
	(0.110)	(0.00000)	(0.114)	(0.174)	(0.177)	(0.111)
CO2 Per Capita (log)	-3.168***	-0.00000**	-2.727***	-3.188**	-3.193**	-3.213***
	(1.008)	(0.00000)	(0.720)	(1.215)	(1.267)	(1.038)
GDP (Logged)	16.036***		2.816**	17.640***	14.855***	12.228***
	(4.534)		(1.074)	(4.953)	(4.185)	(3.879)
GDP Per Capital (Logged)	-15.913***	-0.00000		-13.402**	-10.446**	-11.785***
	(4.903)	(0.00000)		(5.444)	(4.670)	(4.201)
ODA		0.000	0.0001	0.0001	0.0001	-0.0001
		(0.000)	(0.0001)	(0.0001)	(0.0001)	(0.00005)
Time	0.003	0.00000***	0.052*	-0.035	-0.021	0.019
	(0.038)	(0.00000)	(0.030)	(0.052)	(0.050)	(0.036)
Observations	309	309	309	309	309	309
R^2	0.774	0.769	0.916	0.865	0.918	0.780
Adjusted R^2	0.747	0.742	0.906	0.849	0.908	0.752
Residual Std. Error	0.609 (df = 275)	0.00000 (df = 275)	0.454 (df = 275)	0.672 (df = 274)	0.640 (df = 274)	0.576 (df = 274)
Note:						*p<0.1; **p<0.05; ***p<0.01

Figure A.25

Climate Aid DV Comparison & Renewable Electricity Production

	Dependent variable:					
	DV.ps.con.l	CA.GDP.l	CA.GDPPC.l	CA.pop.l	DV.discount.ab.l	DV.discount.prop.l
	(1)	(2)	(3)	(4)	(5)	(6)
Renewable Electricity Production (% of total)	0.590***	0.00000	0.301*	0.506**	0.571**	0.658***
	(0.201)	(0.00000)	(0.153)	(0.236)	(0.210)	(0.183)
World Governace Indicators	0.208*	0.00000***	0.153	0.320*	0.288	0.172
	(0.111)	(0.00000)	(0.117)	(0.175)	(0.175)	(0.107)
CO2 Per Capita (log)	-0.888	0.00000	-0.645	-1.183	-0.980	-0.673
	(0.906)	(0.00000)	(0.685)	(1.126)	(1.108)	(0.847)
GDP (Logged)	16.488***		2.043*	18.132***	15.383***	12.831***
	(4.205)		(1.006)	(4.711)	(3.937)	(3.485)
GDP Per Capital (Logged)	-17.511***	-0.00000		-15.002***	-12.191**	-13.783***
	(4.574)	(0.00000)		(5.123)	(4.412)	(3.891)
ODA		0.000	0.0002*	0.0002	0.0002	-0.00003
		(0.000)	(0.0001)	(0.0001)	(0.0001)	(0.00004)
Time	-0.060	0.00000**	0.030	-0.090	-0.083	-0.053
	(0.045)	(0.00000)	(0.031)	(0.056)	(0.049)	(0.036)
Observations	309	309	309	309	309	309
R^2	0.777	0.758	0.911	0.866	0.919	0.783
Adjusted R^2	0.750	0.729	0.900	0.850	0.909	0.756
Residual Std. Error	0.605 (df = 275)	0.00000 (df = 275)	0.466 (df = 275)	0.670 (df = 274)	0.637 (df = 274)	0.572 (df = 274)

Note: *p<0.1; **p<0.05; ***p<0.01

Figure A.26

Climate Aid DV Comparison & Relative Potential of the Fossil Fuel and Renewable Energy Consumptions

	Dependent variable:					
	DV.ps.con.l	CA.GDP.l	CA.GDPPC.l	CA.pop.l	DV.discount.ab.l	DV.discount.prop.l
	(1)	(2)	(3)	(4)	(5)	(6)
Relative Potential of Energy Consumption	-2.220**	0.00000	0.010	-1.882	-2.639*	-2.985***
	(0.880)	(0.00000)	(1.090)	(1.388)	(1.321)	(0.821)
World Governace Indicators	0.128	0.00000***	0.066	0.245	0.163	0.046
	(0.131)	(0.00000)	(0.128)	(0.172)	(0.165)	(0.118)
CO2 Per Capita (log)	-0.490	0.00000	-0.329	-0.911	-0.616	-0.227
	(1.078)	(0.00000)	(0.788)	(1.225)	(1.153)	(0.986)
GDP (Logged)	17.538***		2.170*	19.431***	16.974***	14.273***
	(4.799)		(1.107)	(5.227)	(4.553)	(4.112)
GDP Per Capital (Logged)	-18.999***	-0.00000		-16.722***	-14.278***	-15.879***
	(5.199)	(0.00000)		(5.686)	(4.986)	(4.406)
ODA		0.000	0.0002**	0.0003**	0.0003*	0.00004
		(0.000)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Time	0.030	0.00000***	0.080***	-0.021	-0.003	0.045
	(0.044)	(0.00000)	(0.026)	(0.056)	(0.050)	(0.037)
Relative Potential and World Governance Interaction	0.256**	-0.000	0.040	0.230	0.307**	0.332***
	(0.096)	(0.00000)	(0.120)	(0.142)	(0.136)	(0.092)
Observations	281	281	281	281	281	281
R^2	0.771	0.766	0.912	0.870	0.920	0.778
Adjusted R^2	0.740	0.734	0.900	0.851	0.909	0.746
Residual Std. Error	0.593 (df = 246)	0.00000 (df = 246)	0.466 (df = 246)	0.651 (df = 245)	0.619 (df = 245)	0.564 (df = 245)

Note: *p<0.1; **p<0.05; ***p<0.01

Figure A.27

Climate Aid and Fossil Fuel Energy Consumption (No GDP)

	Dependent variable:
	DV.ps.con.l
Fossil Fuel Consumption (% of total) (log)	7.303***
	(2.280)
World Governace Indicators	0.248
	(0.162)
CO2 Per Capita (log)	-5.319***
	(1.699)
GDP Per Capita (log)	2.298
	(1.970)
Time	0.080**
	(0.035)
Observations	309
R^2	0.716
Adjusted R^2	0.683
Residual Std. Error	0.681 (df = 276)
Note:	*p<0.1; **p<0.05; ***p<0.01

Figure A.28

Climate Aid and Renewable Electricity Production (No GDP)

	Dependent variable:
	DV.ps.con.l
Renewable Electricity Production (% of total) (log)	0.749**
	(0.314)
World Governace Indicators	0.359**
	(0.174)
CO2 Per Capita (log)	-1.875
	(1.328)
GDP Per Capita (log)	0.526
	(2.082)
Time	0.009
	(0.049)
Observations	309
R^2	0.713
Adjusted R^2	0.680
Residual Std. Error	0.685 (df = 276)
Note:	*p<0.1; **p<0.05; ***p<0.01

Figure A.29

Climate Aid and Relative Potential of the Fossil Fuel and Renewable Energy Consumptions (No GDP)

	Dependent variable:
	DV.ps.con.l
Relative Potential of Energy Consumption	-1.757*
	(0.999)
World Governace Indicators	0.360*
	(0.209)
CO2 Per Capita (log)	-1.752
	(1.643)
GDP Per Capital (log)	-0.221
	(1.747)
Time	0.123***
	(0.032)
Relative Potential and World Governance Interaction	0.220*
	(0.115)
Observations	281
R^2	0.706
Adjusted R^2	0.666
Residual Std. Error	0.672 (df = 247)
Note:	*p<0.1; **p<0.05; ***p<0.01