

How to Improve Multilateral Environmental Agreements: A Case Study in Balanced Institutional  
Design Mechanisms in the Climate Change and Ozone Regime

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## ABSTRACT

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With climate change being one of the largest existential threat's civilizations has ever faced and global cooperation the only conceivable solution, why have the existing MEAs of the climate change regime failed? Moreover, why have MEAs in other environmental regimes, such as the ozone regime, been so much more successful than MEAs in the climate change regime? To investigate this question, I use a theoretical framework of international law and focus on the specific way the institutional design of agreements can yield greater success. I define success in a two-pronged manner which focuses on participation and compliance.

This paper takes a comparative analysis between the ozone regime and climate change regime to dissect what specific features made the Montreal Protocol so much more successful than the Kyoto Protocol. I argue that international relations present one of the largest impediments to a meaningful solution. Furthermore, I argue that by balancing legal provisions of flexibility and compliance within an agreement such political obstacles can be surmounted. This paper concludes that while you cannot simply implant the blueprints of one successful MEA to another, especially across regimes, you can incorporate institutional design features which yield both increased ratification and adherence. This presents an opportunity for the Paris Agreement to build upon the successful features of the Montreal Protocol and incorporate design features which will allow for the continued strengthened of state commitments.

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## Introduction

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International environmental law is one of the most nascent systems within the international legal order, arguably not beginning until the 1970s with the 1972 Stockholm Convention. Although recently formed, the body of international environmental law (IEL) has been burgeoning, and within the past 50 years there has been a proliferation of multilateral environmental agreements (MEAs). Within the realm of IEL there are a number of regimes which comprise different subject areas of concern or cover different regions. Multilateral Environmental Agreements often overlap, but unlike some other areas of international law, IEL does not have any overarching framework which connects the regimes (Ong 2010). For example, the ozone regime and climate change regime are two separate structures, although they overlap in area coverage of harmful emissions, they are not connected by an overarching framework. On the contrary, the ozone regime intersects with the climate change regime's concern over emissions because of an amendment to the Montreal Protocol known as the Kigali Amendment. This amendment explicitly addresses hydrofluorocarbons (HFCs), which are greenhouse gases (GHGs)—not an ozone depleting substance (ODS). While interrelated in this manner, the ozone and climate change regime are two completely different institutional structures.

While some MEAs are viewed as successful, the majority of them are considered to be flawed (Andresen, Boasson, and Hønneland 2012). Some of the least successful MEAs are those under the climate change regime, which is alarming, as for nearly two decades the Intergovernmental Panel on Climate Change has stressed the urgent need to mitigate the impact of climate change and limit temperatures from rising 1.5° C above preindustrial levels. With

climate change being one of the largest existential threats civilizations have ever faced, and global cooperation the only conceivable solution, why have the existing MEAs of the climate change regime failed? Moreover, why have MEAs in other environmental regimes, such as the ozone regime, been so much more successful than MEAs in the climate change regime? What factors explain the variation in levels of success across environmental regimes and specifically MEAs within the climate change regime?

There are a plethora of reasons that MEAs could be unsuccessful: from lack of global support to poor construction or unclear language. Since IEL lacks an overarching framework which connects the different regimes, specificity within agreements of exactly what environmental factors are under jurisdiction—whether it be reduced GHG emissions or specific levels of investment in renewable energy—and to what extent ratifying states must commit themselves to said standards, is very important. Many scholars cite lack of clear and precise obligations of member states as reasons for failure of international agreements (e.g., Franck 1988). Other scholars have also highlighted lack of specificity regarding the environmental factors themselves as a weakness in MEAs in particular (Young 2011; Etsy and Moffa 2012). To illustrate, some agreements may have an objective of limiting the impact of global warming, but without clear instructions of how to achieve this, such as limiting a specific emission or chemical production, there is a lot of ambiguity for member states as to how to achieve this goal. While many see specificity and support as something which comes mainly from the agreements themselves, others suggest that domestic institutions need to assist with compliance and implementation of treaties (Peel 2020).

Another cause of failure in international agreements is conflict between key states, or what is often the case in IEL, negotiating blocs. The most challenging of obstacles occurs when

there is a power asymmetry among key negotiators, which can lead to an agreement being plagued by an issue known as the “Lowest-Common-Denominator Problem” (LCD). This is a problem in which the structure and goal of an agreement are weakened during negotiations as deep commitments are discarded in favor of participation from powerful states, which are often averse to binding ambitious obligations (Depledge and Terhalle 2013; Downie 2020, 114-116). In other words, an agreement’s commitments are reduced to the lowest possible degree in order to gain support from states hesitant to join. This problem is plentiful in MEAs due to the fact that most commitments impose high limits or restrictions on state activity, forcing financial loss in one sector or investment in another. Such commitments to reductions in an industry are often perceived by states as especially disadvantageous if a competing state abstains from ratification and are thus under no legal obligation to inhibit their actions (Marcoux 2009; Gomes 2012). For the climate change regime this can be particularly undermining to the objective of mitigating the planet’s collective warming, as the goal is all but unachievable if the top emitters refuse to ratify an agreement and alter their behavior (Stein 2008).

Furthermore, even if the top emitting states ratify an agreement, if there is not a perceived level of fairness in the obligations and contributions of each state—even burden sharing—then this might engender unwillingness to comply (Etsy and Moffa 2012). Lack of compliance would also undermine an agreement even if high commitments are in place. While there are many converging factors which can lead to an agreement’s ultimate failure, I argue that the most influential role is that of international conflict. As a consequence of international conflict, an agreement could fail to attain ratification from enough key states to achieve its goal, or the agreement could become so diluted as to be ineffective—as demonstrated by the lowest-common-denominator problem.

The following review of the literature begins with a discussion of common geopolitical obstacles in the global policymaking arena. Next, I discuss the various ways scholars have evaluated the success of MEAs and lay out my own criteria for evaluating success. The review will then proceed to dissect the current literature on the utility of institutional designs in MEAs and their influence on an agreement's success. The section concludes with current scholars' assessments of the three agreements this paper analyzes: the Montreal Protocol, Kyoto Protocol, and Paris Climate Agreement.

## **Literature Review**

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### **Background International Environmental Laws**

#### *International Relations*

International relations present one of the largest obstacles to a multilateral agreement's success. Marcoux (2009) emphasizes the fact that power asymmetries among negotiating states plays an outsized role in agreement construction and more specifically, looks at power asymmetry as defined by issue-specific power with regard to environmental goods. Power asymmetry is attributed by many to causing MEA goals to be weakened, and ambitions to fall prey to the lowest-common-denominator rule (Downie 2020, 115). Similarly, others note that to understand MEAs one must understand the deeper geopolitical trends and conflicts that surround them (Depledge and Terhalle 2013; Gomes 2012). Depledge and Terhalle (2013), for example, examine the "great-power-politics" and specific dynamics between countries which are most determinative and possibly detrimental to achieving success. Their paper concluded that the resurging relationship between China and the US, and their collective failures to work within the existing global governance structure, has prevented the institutional redesign necessary to

confront climate change. It is more difficult to secure compliance if the perceived cost of the treaty is higher than the benefit (Faure 2020). Similarly to Depledge and Terhale (2013), Martimore and San-Zantman (2016), note that one of the most prominent contentious international relationships is between the US and China. Their rank as two of the top three GHG emitting states, makes it nearly impossible to have a successful climate change MEA without their participation. For example, Sunstein (2007) notes that one of the main reasons Kyoto was set up for failure was the fact that it never secured ratification from the US. Even after participating in negotiations, the US never ratified the agreement because they perceived it as detrimental to the US economy and not strict enough on developing countries. Without key players ratifying an agreement, it is difficult to achieve the aggregate reduction of emissions necessary to limit warming.

The often antagonistic geopolitical dynamic between the Global North and the Global South presents another determinative role in the negotiations and outcomes of MEAs. The main point of friction between these two groups is that the developed northern countries have historically been top emitters, producing the most greenhouse gases, and by virtue, exacerbating climate change the most (Najam 2020). These countries have also largely established their wealth and development precisely because of their ability to burn fossil fuels and produce such emissions. Conversely, many environmental agreements limit developing countries from producing emissions or burning fossil fuels, in essence preventing them from benefiting from fossil fuels and developing their countries in the *same* way the developed countries have. It is for this reason that many states in the Global South view international environmental regulation “as an effort to sabotage the south’s development aspirations” (Najam 2020, 53). Other scholars point to the resentment the south has of the north as a point of hesitancy developing countries

have to joining MEAs, which is one reason the now prominent principle of common but differentiated responsibility was developed (CBDR) (Melkas 2007; Najam 2020; Etsy and Moffa 2012). As Melkas (2007) elaborates on, she sees “substantive equality” as a more influential factor to the effectiveness of MEAs, particularly in regard to their cost-effectiveness and the relationship between developed and developing states.

When examining the power dynamic between the US and China, it is valuable to note that this relationship can also be viewed as north vs south, even though China is considered to be a part of the emerging economies, or BRICS, and is viewed by many to be one of the world’s leading powers. BRICS is an acronym for: Brazil, Russia, India, China, and South Africa.<sup>1</sup> China still remains in the UN negotiating bloc of the G77—a group of developing states primarily in the southern hemisphere—and notably will voice concerns of the developing states, protecting their collective interests during climate agreement negotiations (Depledge and Terhalle 2013; Najam 2020). China’s dual interest in negotiations, as both a world power and representative of the Global South, demonstrates the reality Marcoux and Urpelainen (2013), observed that, “while states do design international law to solve cooperation problems, states’ interests are rarely confined to this. States also negotiate international law in the shadow of domestic and international political pressures” (164).

### *How to Evaluate “Success”*

Global cooperation is practically required to address climate change, as no state can adequately confront the existential threat on its own. Thus, it is imperative that as an international community, countries are able to come together and commit themselves to effective

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<sup>1</sup>These other states are all high emission states and relevant to the discussion of geopolitical relationship in MEAs, however this paper will not look at any of these in depth, aside from China.

agreements in order to improve the success of MEAs in the climate change regime and limit the catastrophic consequences of climate change. “Success” means different things to different scholars. Some researchers define success as, inclusive of compliance, efficiency, and effectiveness (Rosen 2015). Others use the term success and effectiveness interchangeably to mean an agreement’s ability to meet its goals (Esty, Moffa 2012; Young 2011). Still, others define success in a more elaborate manner in which an agreement secures participation from states, encourages and enforces compliance, and also secures “deep commitments” (Hovi, Skodvin, Stine 2013; Liverani 2010). In departure from this last approach, I define success in a two-pronged manner which focuses on participation and compliance. First, with regard to participation, a successful agreement must attain widespread ratification from countries, most importantly, ratification by top emitters and world powers. Second, specific to compliance, agreements must achieve their environmental goals, namely emissions reductions through the adherence to ambitious obligations from key states. While some scholars have evaluated success of MEAs in similar terms, I deviate from previous research by evaluating success based on their overall performance—from negotiations to countries’ individual results after entry into force. In, contrast to this all-encompassing assessment, other scholars have primarily looked exclusively at one aspect of the agreement process at a time, such as negotiations, ratification, or compliance (Faure 2020; Savaşan 2019; Von Stein 2008).

Although effectiveness and success are closely linked and often used interchangeably, I am intentionally not mixing the two, as I see them as different ends. To elaborate, an agreement can be effective in meeting state obligations and still not attain the overarching goal of the agreement, such as stabilizing emissions enough to lower temperatures to an inhabitable level. It should also be noted, that while having a high number of ratifying states is more advantageous

for success, the “weight” of the states plays a crucial factor, as in their degree of contribution to the environmental problem and their clout in the international arena (Sandler 2020). For example, if 150 states ratify a treaty, but those states do not include the top emitters—such as the US, Australia, India, China, Canada, and the EU—then the success of the agreement, even if all states fulfilled their obligations, would be severely limited by the extent of their collective emissions and the goal, by virtue, would be undermined. While most scholars acknowledge this reality and point to it as a failure of many MEAs, Young (2011) argues that *above all else* the design of the treaty itself is most consequential to an agreement’s success.

### *Institutional Design Features*

Many others have pointed to agreement design as a significant determinant in an agreement’s success (Marcoux 2009; Young 2016; Martimort and Sand-Zantman 2016; Kim, Tanaka, and Matsuoka 2017). Inversely, many have accused the Kyoto Protocol of being riddled with design flaws and an ultimate contributor in its failure (Sandler 2016, 353; Rosen 2015, 31). Furthermore, Young (2011) argues that design features are so powerful, as to supersede the actual strength of the problem for which the MEA addresses. Young argues that even problems considered more difficult than others, such as the daunting task of mitigating the risk of climate change, can achieve the same level of success as a seemingly smaller environmental issue could as long as it is well designed. The design of an agreement is a delicate act though, as it needs to encourage both elements of the two-pronged approach I am using to evaluate the success of MEAs: both maximize participation from key states and achieve environmental results through state commitments. This paper refers to institutional design features as a comprehensive term which includes the balanced legal mechanisms in MEAs, whether they be for compliance or flexibility, or otherwise.

First and foremost to this definition, an MEA needs enough signatories to collectively represent sufficient reductions to achieve the agreement's environmental goals. Not only is high participation required, but it is important to have top emitting countries ratify MEAs, otherwise it would take many, many smaller contributors taking action for an agreement to be at all effective. More importantly, greater participation is required to create an equitable long-term solution (Liverani 2010; Aakra, Hoyi, and Tora 2013; Young 2011; Rosen 2015). However, states often choose to abstain from ratifying MEAs due to political conflict between states or perceived disadvantage when joining an agreement as described above. The climate change regime is extremely susceptible to this, as the act of abating state emissions or environmentally damaging actions most certainly comes at an additional expense or economic loss. Each state perceives varying degrees of personal costs for every MEA which creates an even more daunting challenge (Martimort and Sand-Zantman 2016, 669-670). If one state perceives their individual cost as higher than another state's, this could lead to intense conflict.

One strategy to increase state participation is incorporating flexibility provisions within MEAs. Such provisions can make agreements more appealing from a state's perspective because of the autonomy they give states in shaping their own commitments. Although there are some mixed results on the effectiveness of flexibility provisions in MEAs, they have been determined by many to improve the overall results of an agreement, particularly by incentivizing higher rates of ratification (Boockmann and Thurner 2006; Koremenos 2001, 2005; Faure 2020; Marcoux 2009; Stein 2008). I define flexibility provisions in a more general manner, similarly to Kim, Matsuoka, and Tanaka (2017), in which "flexibility embraces not only mechanisms such as the 'emission trading systems' of the Kyoto Protocol, but also procedures that can influence IEA implementation (80)." I do this in order to avoid confusion with the Kyoto flexible mechanisms

which I will be discussing in my case analysis of the agreement in chapter four.<sup>2</sup> Furthermore, some scholars have broken down flexibility provisions into different categories of: adaptive, interpretive, and transformative (Marcoux 2009; Kim, Matsuoka, and Tanaka 2017 ).<sup>3 4</sup> Marcoux (2009) notes that it is essential to disaggregate types of flexibility, as they are used strategically under different circumstances and for various purposes often as a solution to cooperation problems. Marcoux also notes that the inclusion of flexibility is correlated with international relations, particularly when there is a large power asymmetry between negotiating states.

It is true that “sometimes the political impact of a treaty will depend not so much on whether all parties to it subscribe to exactly the same package of rights and obligations, but on whether the treaty is acceptable to as many states as possible” (Voyiakis 2010, 109). However, high rates of participation in MEAs, achieved through too much flexibility without compliance measures, may incentivize non-adherence to targets, making the MEAs objective unattainable and all but worthless. In this vein, many scholars argue that effective compliance provisions are needed in environmental agreements (Faure 2020; Martimort and Sand-Zantman 2016; Goetyen and Maes 2011). Aakra, Hovi, and Skodvin (2013), have focused particularly on the ways compliance mechanisms can improve climate change negotiations and deliver more detailed enforcement measures, which in turn, increase success. Young (2011) argues that compliance mechanisms are not the most important aspect to an agreement’s success, especially if the regime is not fundamentally regulatory in nature.

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<sup>2</sup> It should be noted that some scholars refer to what I call flexibility provisions as flexibility mechanisms when referring to their use outside of the Kyoto Protocol (Downie 2020; Melkas 2007; Sunstein 2007).

<sup>3</sup> This paper will use these general types of flexibility as a categorizing framework but will assign a more specific typology in chapter 1 and elaborate on the definitions and their applications.

<sup>4</sup> Kim, Matsuoka, and Tanaka only divide flexibility into the two categories of adaptive and transformative, leaving out interpretive flexibility as Marcoux does. However, I believe that interpretive flexibility is a distinct and important category of its own.

It is noteworthy that Marcoux and Urpelainen (2013) concluded that strict treaty provisions or compliance mechanisms are more likely to exist when states perceive that they will not be enforced. This aligns with a realist perspective that states do what is in their best interest, and a state might not agree to compliance mechanisms or punishment if they (i) thought they would be liable to punishment if they could not live up to demanding obligations or (ii) if they thought the punishment would be enforced and injurious to them. However, this paradox reveals the need of a balance between compliance and flexibility—flexibility, on the one hand, allows states to feel comfortable and confident in their capabilities of fulfilling obligations, while compliance ensures states live up to these commitments. Goeteyn and Maes (2011) discuss the ways in which compliance mechanisms have taken over as the preferred dispute settlement procedure in MEAs, however, they argue that the best compliance mechanisms are those which have standing commitments and support, not just ad hoc bodies. They elaborate that this universality would ensure that a state party to a treaty involved in a non-compliance procedure would not be able to avoid the process ( Goeteyn and Maes 2011, 816).

## **Agreements**

Not all environmental regimes are unsuccessful. The ozone regime, which is widely regarded as successful (Downie 2020; Faure 2020; Sunstein 2007; DeSombre 2001; Young 2011; Savaşan 2019), is perhaps the most notable exception. Such differences in success across regimes, begs the question, what made the ozone regime and specifically the Montreal Protocol, so successful and other MEAs not? To begin this investigation, it is necessary to analyze the Montreal Protocol as one of the trademark successes of international environmental agreements. DeSombre (2001) notes that the negotiations for establishing the treaty were particularly effective for working out differences amongst states and importantly confronting uncertainty with concrete measures. She

goes on to acknowledge much of the success lies in the design of the treaty to allow for continual and considerable adjustments as new information was available through the use of conventions and protocols. Other scholars have also noted that the negotiations, in addition to the Meeting of the Parties (MOP)—which can be thought of as equivalent to the Conference of the Parties (COP)—were of particular importance (Downie 2020; Sandler 2017; Savaşan 2019). Downie (2020) distinguishes binding rules as the most important byproduct of such negotiations, further noting that with the Montreal Protocol the most influential of such binding rules related to state's emissions reductions, rather than technical or financial assistance (109-110).

In addition to effective negotiations, why does ozone stand out as an effective regime in comparison to climate change? Many have noted that the economics of ozone made it particularly less burdensome in the long run to phase out ozone depleting substances (ODS) because of direct substitutes readily available (Gareau 2010; Sunstein 2007; Sandler 2017). However, DeSombre (2001) remarks that, on the contrary, what made the negotiations so exceptional was the fact that initially there was no substitute for CFCs readily available and any existing potentials very expensive (50). With that being said, DeSombre (2001) does acknowledge that there is still a cost to committing to the agreement. She suggests that what makes the cost more palatable to states, particularly the developed states, is that the depleted ozone was not only a direct result of the north's actions, but also the consequences directly negatively impacted them. Sunstein (2007) supports this view, noting that "to the United States, the monetized benefits of the Montreal Protocol dwarfed the monetized costs, and hence the circumstances were extremely promising for America Support" (5). Furthermore, the physical properties of GHGs compared to ODS makes it a more difficult problem to isolate blame and assign just consequences. Sandler (2017) suggests that the nature of climate change and GHG is

more difficult to contain, partly because it is more susceptible to transboundary movement. Although the differences in scope and economics of the two regimes and associated environmental issues are stark, Young (2011) deviates from other scholars in his take that these disparities do not inherently predispose agreements to be more or less likely to succeed.

As for the climate change regime, it is advantageous to look at both the regime as a whole, and then break down the specific agreements I am analyzing in this paper: the Kyoto Protocol and the Paris Climate Agreement. Since the Kyoto Protocol can be thought of as the predecessor to the Paris Agreement, I will discuss it and its design features first. Additionally, because the Kyoto Protocol has already undergone its first commitment period and the Paris Agreement has yet to undergo its first global stocktake, it is easier to assess its outcome.<sup>5</sup> In comparison to the Montreal Protocol, the Kyoto Protocol has been received by world leaders, scholars, and the public alike, as if not a failure, than drastically falling short of the multilateral agreement needed to meet the moment and challenge (Martimort and Sand-Zantman 2016; Melkas 2007; Sandler 2017; Sunstein 2007; Rosen 2015; Savaşan 2019, Stein 2008). There are many different attributes which have led to the shortcomings of the Kyoto Protocol. For one, many see ratified states' commitments as insecure and shallow, either due to a lack of compliance measure, or for its non-binding obligations for non-Annex I countries (Martimort and Sand-Zantman 2016). Others see the differentiation between Annex and non-Annex states as flawed for inadequately addressing the inequalities amongst states (Melkas 2007). Melkas (2007) goes on to explain that the Kyoto Flexible Mechanisms created a cost effectiveness incentive which shifts the emphasis from assisting developing countries, to skirting personal responsibility

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<sup>5</sup> The global stocktake, as articulated in article 14 of the Paris Agreement, includes a global assessment of the agreement's progress and the individual contributions of the member parties to the agreement. This oversight provision was determined to be conducted every 5 years in accordance with the decision made at CP21.

of state emissions. States exploit the cost effectiveness of CMD in developing states and rely on it as a cheaper alternative than investing in projects in their own countries.<sup>6</sup> Additionally, this creates a problem in which developing countries struggle to invest in emission reductions in their own country, as the most affordable and cost-effective options have already been capitalized on by developed Annex-1 countries (Melkas 2007, 263-265; Sandler 2017, 353).

A question one may ask themselves is, why did Kyoto fail when it was said to have been based on a template akin to Montreal, which itself was successful? One reason, aside from those mentioned above, is the failure of key states to completely commit themselves, such as Canada, Russia, and the US (Sandler 2017).<sup>7</sup> In a close analysis of why states, such as these, abstained from ratification, or withdrew, Sunstein (2007, 5) writes:

If the US complied with the Kyoto Protocol on its own, those analyses suggested that it would spend a great deal and gain relatively little. If all parties complied, some of the most influential analyses suggested that the US would nonetheless be a net loser. Because of the distinctive properties of the agreement, it was not at all clear that the world as a whole had more to gain than to lose from the Kyoto Protocol.

This speaks to the ongoing challenge of international relations as one of the greatest impediments to the success of an MEA. The US saw itself as a net loser in the Kyoto Protocol, even though some of its adversaries committed, however notably missing from binding commitments were the emerging powerhouses of China and India (Sunstein qtd. President Bush 2000, 28). Rosen (2015) also believes that the high opportunity of Kyoto was one of its fatal flaws and argues that its design mechanisms only exacerbated the issue. Rosen speaks to the fact that the structure of

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<sup>6</sup> CDM stands for Clean Development Mechanism, one of Kyoto's three main flexibility mechanisms.

<sup>7</sup> While a key player in negotiations, the US never ratified the Kyoto Protocol. Although both Russia and Canada initially ratified it, Canada later withdrew and Russia never agreed to the second commitment period.

Annex I and non-Annex I countries put pressure exclusively on top emitters, incentivizing free riding from developing states who could still contribute considerably to emissions without consequence.

The Paris Agreement on the other hand has elicited a more varied reception, partially because most assessment was speculative in nature as the outcome is yet to be born out. For this reason, some have calculated various possible degrees of warming the agreement could produce if it is observed and more or less strictly adhered to (Allen et. al. 2018). Others have analyzed different facets of the agreement aside from strictly emission calculations. Many such scholars view Paris as a mixed bag. Some see the overall intention and unique bottom-up approach as promising, but are still unsure if the agreement and member states can actually deliver on their promises (Duit, Linnér, Nilsson, and Jernnäs 2019; Young 2016; Falkner 2016). Kinley (2019) notes that the COP which itself set the framework for the Paris Agreement, COP-21, was one of the most highly regarded and effective COPs on record and posits that this success is a hopeful indicator.

On the contrary, some regard the agreement as ungrounded in our climate reality, with the agreement itself as a botched attempt to solve an existential issue without any concrete measures (Spash 2019). Similarly, Cléménçon (2016) ultimately does not think Paris has enough of a blueprint to move forward in achieving temperature stabilization—even with such aspirational goals, they are just that, aspirational. This does leave room for future ratcheting up of commitments through future COPs and subsidiary bodies oversight (Young 2016; Savaşan 2019, 229).

This paper will proceed from this existing literature by expounding on what elements lead to an environmental agreement's success or failure. Chapter two will continue to lay down a theoretical foundation for which I am analyzing the agreement and explain the international relations and geopolitical dynamics as well as their influence on the construction of agreements. This chapter will also introduce a typology for the institutional design provisions and flexibility and compliance which I am investigating. Chapter three uses this theoretical framework to unpack the ozone regime with particular attention paid to the Montreal Protocol and pivotal negotiations. Chapter four will continue in this vein, but switch focus to the climate change regime and the Kyoto Protocol. Chapter five directly compares the two regimes and analyzes which elements yielded more success for the ozone or climate change regime respectively, and why. It will also assess the outcome of the agreements by graphing emissions data on ODS and CO<sub>2</sub> for key states for the ozone regime and climate change regime respectively. To conclude, chapter six will briefly address the Paris Agreement and its design features, remarking on what we have learned from Montreal and Kyoto and the ways Paris can be improved upon to yield higher success.

I am contributing to the literature by defining my own assessment of success and then evaluating it by looking at the agreements institutional design, key negotiations, and lastly quantitatively through relevant emissions. All the while, I am using an underpinning of international relations as a context for which agreements are made and can contribute to their success or failure. While legal provisions such as flexibility and compliance have been looked at separately, I am taking the unique approach of creating my own typology for the two and analyzing how they can be balanced within agreements to both subvert international conflict, thus increasing the number of ratifying states, and improve compliance with environmental

commitments. The Kyoto Protocol and Montreal Protocol have been compared in the past, but never in this particular manner of institutional design and legal provisions of flexibility and compliance.

## **Chapter 2 ~ Background on IEL and Institutional Design Features**

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### **Important Dates**

- 1972-** The Stockholm Conference on the Human Environment  
The United Nations Environment Program is established
- 1985-** Vienna Convention for the Protection of the Ozone Layer
- 1987-** The United Nations report, *Our Common Future* Published
- 1989-** Montreal Protocol enters into force
- 1992-** Rio Conference on Environment and Development  
UNFCCC is established
- 2000-** UN Millennium Declaration
- 2002-** World Summit on Sustainable Development in Johannesburg
- 2005-** Kyoto Protocol enters into force
- 2016-** Paris Agreement enters into force

### **Background on IL**

The founding principles of international law effect how states view, create, and adhere to international law today. At the core of these principles is the supremacy of state sovereignty, as formally established by the Treaty of Westphalia after the 30 year war in 1648, and constantly redefined in international law since. Although it seems that international law would be antithetical to state sovereignty, this is avoided by the central tenant of international law, which is that it is established *voluntarily* and *collectively* among states (Cali 2010, 5). States are only

liable to agreements which they consent to, and only to other states which have also consented to the same agreement or binding law, whether bilateral or multilateral (Anghie 2010, 53).

Therefore, in the MEAs being analyzed in this paper, and MEAs generally, it is only member states which can be held accountable, which is why ratification is the first step towards a successful agreement.

Since it is the choice of a state whether or not they ratify any international agreements, one might ask, why would a state want to ratify an international agreement? Also, what gives international law legitimacy in the first place? To answer the former question, one of the main reasons may be reciprocity. Reciprocity is the regulation of states' behavior with each other on the basis that certain actions will be mutually returned between the parties in obligation. With reciprocity comes *predictability*, which establishes the basis of collective security, another related, but distinct, catalyst for the establishment of international law. Collective security is the vested interest states have in working together to achieve a collective goal and set regulations that would otherwise not exist—especially from global threats, such as climate change (Anghie 2010, 58). When a binding multilateral agreement is made, it hypothetically ensures that all states' actions towards each other will be reciprocated, which in turn can create a great degree of collective security. As mentioned in the literature review, the idea of reciprocity has been adjusted to take into account states' varying degree of capability, which is why the principle of common but differentiated responsibility (CBDR) has become a standard in MEAs rather than identical contributions of reciprocity.<sup>8</sup> This adjusted notion of equality has emerged from the broader principle of equity in international law, and is imperative for agreements to consider if

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<sup>8</sup> Although there is no overarching framework which connects MEAs, the UNFCCC is used as guidance for many current agreements in the climate change regime. At the framework's core is an emphasis on common but differentiated responsibility (Preamble, Arts. 3, 4, UNFCCC).

developing countries are to participate; gaining support from developing states is central to a successful climate MEA achieving widespread participation (Peel 2020, 86).

With regard to MEAs in particular, it is impractical for reciprocity to not take into account varying degrees of states' capabilities, and in the instance of climate change, the degree to which each state has contributed to the problem. As Melkas points out:

Thus, by turning attention away from strict sovereign equality in order to take into account other factors, differential treatment aims at adopting a substantive equality – equal opportunities or benefits. These cannot be achieved through reliance on sovereign equality, as states are inherently unequal. The differences between states would otherwise render formal equality useless or even counter-productive. Thus, substantive equality refers here to situations where sovereign equality gives way to accommodating non-legal factors, the factual circumstances that states may find themselves in. (Melkas 2007, 278)

Substantive equality is at the core of CBDR and has been an aim of MEAs for decades, visible through the Annex structure in the Kyoto Protocol and Nationally Determined Contributions in the Paris Agreement. What is not yet agreed upon, is how to weigh states' contributions and structure commitments in a way that makes them both equally effective.

Expert international lawyer, Thomas Franck, believes that while there are other factors which prompt states to ratify and adhere to international agreements, it is ultimately a law's perceived level of legitimacy which compels states to ratify and abide by international agreements.<sup>9</sup> Legitimacy is based on four main components: determinacy, symbolic validation, coherence, and adherence (Franck 1988, 712). Determinacy is the degree to which "the text [of an agreement] is able to convey a clear message, to appear transparent in the sense that one can

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<sup>9</sup> While some, such as a realist might argue that legitimacy is irrelevant, and only a state's perceived benefit matters, one overlooks the possibility that legitimacy is a part of a state's calculation in their benefits.

see through the language to the meaning” (Franck 1988, 713). This is straight forward in the sense that, if the language of a law is lofty, and the meaning of it allusive, states are less likely to be regulated by them. However, when the meaning is clear and the expectations laid out obviously, “those addressed will know precisely what is expected of them, which is a necessary first step towards compliance” (Franck 1988, 713). Symbolic validation helps give determinacy to the cultural and anthropological dimensions of an agreement and is slightly more difficult to tangibly conceptualize.<sup>10</sup> The other two aspects of legitimacy can be defined as follows—coherence is the degree to which a law reinforces and works with existing respected laws; “It encompasses the further notion that a rule, standard or validating ritual gathers force if it is seen to be connected to a network of other rules by an underlying general principle” (Franck 1988, 741). For example, if many agreements confirm the same belief, rule, or obligation, then it almost sets a standard for which states are less likely to deviate as the agreements jointly create a surmounting evidence of its authority.<sup>11</sup> Finally, there is adherence, “used here to mean the vertical nexus between a single primary rule of obligation (“cross on the green; stop on the red”) and a pyramid of secondary rules about how rules are made, interpreted and applied: rules, in other words, about rules” (Franck 1988, 751).

The ultimate objective of the international legal order is to provide a preeminent structure for various members of the international community to cooperate on collective problems, create norms, regulate behavior, and resolve issues (Voyiakis 2010, 102). Just as with domestic law, international law fulfills legislative, administrative, and adjudicative functions (Peel 2020, 69).

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<sup>10</sup> While symbolic validation is one of Franck’s four main aspects of legitimacy, it is not a focal point in the analysis of MEA’s in this paper.

<sup>11</sup> As mentioned in the beginning of this paper, international environmental law is plagued by either region or issue specific treaties, which make it difficult for them to establish a high level of coherence among each other.

These functions jointly establish the norms and commitments which conform to such standards and ultimately place limits on state activities and their impact on the environment. To further understand the legitimacy and roles of international law, one must understand the agreement construction process and the international relations which characterize it.

### **International Relations**

As with all international law, IEL falls within the backdrop of international relations and the geopolitical dynamics which shade every stage of the global policy making process—from negotiations to ratifications and enactment. The scale of participation in the MEAs analyzed in this paper brings with it intricate relationships between many different member states, but one of the most influential geopolitical dynamic is between the Global North and the Global South. This can be characterized as the division between the developed and developing countries, with the wealthier developed countries primarily falling within the northern hemisphere—with the exception of a few countries such as Australia—and the poorer developing countries laying in the southern hemisphere. While this division is not as monolithic as binary, it does have salience and is evident through negotiating blocs at the UN.

Historically the north has been the primary contributor to many of the environmental problems IEL covers, most notably climate change. The north and developed countries have been the largest contributors to GHGs and continue to be so even with reductions. This corresponds to the polluter pays principle, which like CBDR has been a standard in the international environmental arena—taking hold even earlier since introduced in the Stockholm Convention and adopted by the UN Environmental Program. As the name implies, the state culpable for environmental degradation should be the one responsible for any resources expended in the clean-up (Andersen et al. 2012, 12; Ong 2010, 313). This is another factor, along

with CBDR, which places a larger amount of responsibility on the north to take charge with higher levels of commitment in the environmental agreements covered in this paper.

While there are other groupings in the international relations arena, and various subsets which reinforce the division of the south versus north, such as the BRICS or NAM, it is most apparent through the G77 bloc at the UN. BRICS is an acronym which stands for the informal collection of emerging global economies: Brazil, Russia, India, China, and South Africa. NAM, or The Non-aligned Movement, is an officially established group which pushed for developing issues to be at the center of international development discussion, although it has withered in recent decades due to a lack of stable leadership. The G77 is a coalition of 134 developing member states of the UN, and has become a principal vehicle of advocacy and support for developing countries. The block provides a platform to bolster the voices of developing countries and their collective concern to counter the power of the developed north (Betsill and Fiske 2020, 277; Najam 2020, 247-250). One might assume that as states develop and grow it is unrealistic that 134 states would agree on “collective” concerns, however, “empirical evidence suggests, at least until now, that even when developing countries have different national priorities on specific issues in global negotiations—something that should not be surprising—they almost always choose to pursue these interests within the framework of the southern collective, the G-77” (Najam 2020, 249). This is particularly interesting when looking at certain states, such as China, which is now a world superpower and arguably has just as much national interest in principles which apply to states of the Global North. This juxtaposition has given China a duality of power as both a representative of the Global South and a main contributor to environmental degradation—*de facto* virtually requiring it to commit itself to any MEA in order for it to be successful in achieving its collective aim (Marcoux and Urpelainen 2013).

As China has risen to power and usurped the US as the top emitter of GHG in the world, another dynamic of contention has formed between the US and China. Terhalle and Depledge (2013) consider this international relationship a dominant and influential conflict amongst the great-powers and observe that,

both countries, at least in their rhetoric, have insisted that any greater enmeshment is dependent on that of the other country. It is well known that the US has consistently claimed, for economic reasons, that it will not sign up to legally binding commitments that do not also apply to other 'major emitters' (i.e. China). Likewise, China is well versed in the refrain that developed countries (i.e. the US) bear the most responsibility for the cumulative emissions in the atmosphere, and thus must take the lead in addressing the problems before developing countries (i.e. China itself) take on stronger obligations. (578-579)

Other states outside of the US and China have similar tensions regarding how much each state should be contributing to MEAs. While it is now regularly agreed upon that CBDR should be at the center of MEAs, and the south has tacitly agreed to commit itself to contribute to some extent, it is often a point of dispute between how far this differentiation should apply. While the south wants to ensure that it has adequate space for its future development, this does not necessarily mean they should be exempt from obligations. This is one main critique of the Annex system used in the Kyoto Protocol, which only constrained Annex-1 developed countries to have binding commitments. All of the developing countries, even emerging economies and leading emitters, such as China, were exempt from any binding regulations. Alternatively, the south has criticized the north for failing to live up to commitments in the past. This historical lack of follow through fuels more apprehension from the south when engaging in future agreements with the north, out of fear that they will continue to fall short on their duties (Najam 2020, 263). Concerns over commitment relate directly to the problem of free riding; this occurs when states

gain the benefits of an agreement without paying their fair share of the cost (Downie 2020, 113). Free riding can occur at the intensive and extensive margins. Free riding at the intensive margin entails ratifying countries *reducing* their *efforts* to fight pollution, whereas when it occurs at the extensive margins states chose *not to join* an agreement all together and continue with *business as usual* (BAU) (Martimort and Sand-Zantman 2016, 670).

The difference between the two types of free riding divulges the often-inherent tradeoff between achieving a high number of ratifying states and the depth of commitment made by the ratifying states. While a main aim of an agreement is ratification, the obligations also need to be realistic to ensure that states will *actively* participate in them. Creating “realistic” obligations often results in an agreement being reduced to the lowest possible level acceptable by states, especially key players, in order to appease their concern and gain their commitment (Downie 2020, 114-116; Stein 2008). This so-called Lowest Common Denominator (LCD) problem is even more detrimental when unequal adjustment cost of behavior is factored in. All environmental problems can be considered in economic terms of negative externalities. The economic burden of correcting for these externalities is felt *more* by states with heavy investment in harmful industries, causing them to have an unequal adjustment cost of an agreement than other states which do not have such investments (Downie 2020, 119; Martimort and Sand-Zantman 2016, 669-670). For this reason, taking a closer look at the policy making process is necessary to understand how effective legal provisions can be incorporated and balanced in MEAs.

## Global Policy Making Process

### *Negotiations*

Within IEL there are a number of regimes; the two this paper examines are the climate change regime and ozone regime. Regimes cannot be distilled into any one agreement or policy, but rather are a system of norms, rules, guidelines and principles (Downie 2020, 128). Within these regimes exists a number of international treaties which are constructed following the guidelines codified in the Vienna Convention on The Law of Treaties (VCLT). This would be considered a secondary law of process under Franck's rules of legitimacy. The process of making treaties roughly follows three steps: (1) Negotiation, (2) Signature, and (3) Ratification (Voyiakis 2010, 110).<sup>12</sup> However, this brings up the point of binding versus non-binding agreements. Some agreements are binding, in which states have a legal obligation to uphold their agreed role. On the other hand, others are non-binding and include suggested behavior or norms. This differentiation between non-binding and binding agreements is comparable to soft versus hard law, although in IL it is often not such a strict binary distinction. Additionally, certain legally binding agreements may not impose binding restrictions on member states, but are still binding in and of themselves.

Within IL, particularly IEL, it is common for regimes to incorporate an encompassing framework which does not usually include specific binding commitments, but upon which further protocols establish binding commitments in accordance to the standards and objectives laid down in the framework. This is commonly known as the Framework-Protocol Model or

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<sup>12</sup> There is of course more nuance in treaty construction than these three steps and as Voyiakis articulates, it can even further be broken down into five components: negotiation, adoption, authentication, expression of consent to be bound, and entry into force.

framework-protocol approach (Peel 2020, 78; Betsill and Fiske 2020, 276).<sup>13</sup> This framework-protocol model can be used to reinforce general principles of environmental practices without a steep initial obligation. Such obligations can be refined and eased into after the establishment of a framework through one or more related agreements. While some might argue that this model does not have a lot of coherency—allowing for many overlapping but never clearly combined agreements—it does allow for flexibility in regimes to correct course and create new more effective agreements.

The salience of the legal bindingness in MEA's success is debatable. Some argue that legally binding MEAs show “a significant improvement of environment performance” (Kim, Tanaka, and Matsuoka 2017, 77), while others report that whether an agreement is binding or not has a negligible impact on performance (Martimort and Sand-Zantman 2016, 696). Many fault the uneven binding nature of the Kyoto Protocol on only Annex-I states as a reason for its failure (Rosen 2015; Sunstein 2007).<sup>14</sup> I argue that falling at either extreme end of the spectrum—absolute hard law binding commitments with no autonomy versus completely soft non-binding law—is an ineffective approach to constructing an MEA. As Abbott and Snidal (2000) have concluded, I agree that soft law is just as valid as hard law, and furthermore, is valuable in its own right, not just as a “steppingstone to hard law” (456). I believe that for addressing complex environmental challenges, a more nuanced approach is necessary, and flexibility is required as

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<sup>13</sup> Most notably the United Nations Framework Convention on Climate Change or UNFCCC, which recognizes anthropogenic climate change as a collective problem which should be addressed through global cooperation. While it sets a general goal of stabilizing green house gas emissions, it does not give clear guidelines to do so or state specific commitments. Further agreements, such as the Kyoto Protocol and the Paris Climate Accord set these standards. See, <https://unfccc.int/process-and-meetings/the-convention/what-is-the-united-nations-framework-convention-on-climate-change>, for more.

<sup>14</sup> Obligations were only binding for the Annex I countries, all other member states had commitments, but none of which they were held accountable to in a legally binding manner.

counterweight to hard law or binding aspects of an agreement—which are also just as valuable a tool.

Most large-scale multilateral agreements or international laws are developed within the UN. The organization's preexisting structure helps facilitate the creation process and easily allows for negotiations to be convened. During negotiations, all states have the ability to participate in discussion, even if they do not end up signing or ratifying the treaty (Voyiakis 2010, 106). This occurs often, such as with the US during the Kyoto Protocol. During initial negotiations the US, supported by a few other factions, urged for the inclusion of flexibility mechanisms which were ultimately included in the final agreement even though the US did not ratify it (Betsill and Fiske 2020, 286). The negotiation process does not have a prescribed process specified in the VCLT, or any other international law, and therefore, negotiations are platforms where states have considerable freedom in airing their concerns and resolving political disagreement. Procedures for policymaking are developed during these negotiations and establish specific standards for future discussions. The UNFCCC set up the institutional framework for the Climate Change regime which established the annual Conference of the Parties (COP) as the standard form of continual negotiations and assessment. Negotiations are one of the longest and most tedious steps of the agreement making process, however, I argue they are also the most pivotal step in constructing a successful agreement for *all* states.

After initial negotiations, a state's representative will report back to their governing body, and in some cases the public, the results and confirm that it is approved or disapproved by the country's leadership. After an agreement is approved, states then go into a phase of adoption in which a forum is conducted to discuss whether the treaty should be revised or renegotiated before ratification. At this stage, states also discuss the ratification requirements of the treaty,

and at what level of state ratification the treaty will take effect, this is called minimum participation. Unless a treaty's text specifically establishes that reservations are not allowed, a state has the ability to voice reservations before ratification. Reservations are defined under Article 2 of the VCLT as a "unilateral statement, however phrased or named, made by a State, when signing, ratifying, accepting, approving or acceding to a treaty, whereby it purports to exclude or to modify the legal effect of certain provisions of the treaty in their application to that state."<sup>15</sup> Since they are made unilaterally, reservations do not alter the general meaning and obligations of the treaty for other member states. With that being said, all of the agreements assessed in this essay have articles within their texts specifically prohibiting reservations; Montreal Protocol Art. 18, Kyoto Protocol Art. 26, Paris Agreement Art. 27. One of the main reasons for this decision is to maintain the integrity of a treaty, as an agreement can become weakened if significant states or a plurality of members make a reservation.

### **Implementation and Assessment**

After a treaty has been ratified and reached enough members to enter into force, it is difficult to oversee or enforce compliance if there aren't compliance details already incorporated within an agreement. While there are international bodies established to deal with enforcement, such as the ICJ or governing bodies within the UN, they do not have chief authority and are not very effective at enforcement. The ICJ has non-compulsory jurisdiction—states have to consent

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<sup>15</sup> United Nations, *Vienna Convention on the Law of Treaties*, 23 May 1969, United Nations, Treaty Series, vol. 1155, p. 331, available at: <https://www.refworld.org/docid/3ae6b3a10.html> [accessed 8 June 2020]

to the Court considering the case. Once a state “accepts the Court’s jurisdiction,” the state must comply with the Court’s decision.

It is common practice for states to meet periodically to review the agreement and adjustments are commonly made to treaties, either amending certain clauses, adding new instruments to complement older text, or by updating passages to reflect more modern purposes. Generally, these processes require full scale treaty initiation from all members, which would require re-entry into force procedures, and again discussion between domestic officials. To simplify this process, a number of devices have been developed—such as frameworks or umbrella conventions—which establish only general goals and obligation, or the use of easily amendable technical annexes. This applies to the climate change regime through its framework-protocol model established with the UNFCCC. As noted, within IEL, and for the agreements specifically discussed in this paper, the standard format for these meetings are COPs or MOPs.

While routine meetings, some COPs/MOPs reveal important aspects of negotiations, important international relations, or results in the addition of a new legal device. This stage of the agreement making process is especially pertinent to environmental agreements, as the environment is constantly changing, as is our relationship with it, which is why it requires constant readjustment to meet goals.

### **Institutional Design Features**

In order to achieve the two-pronged approach to success as defined in this paper, address geopolitical conflict, and avoid free riding at both the extensive and intensive margins, an MEA needs an adequate institutional design. I refer to institutional design as the strategic formatting of an agreement which encompasses designated procedures and bodies to monitor and deliver on an agreement’s goals. These facets of an agreement can range from a more concrete establishment

of a timeline, to the less tangible inclusion of adjusting goals when more scientific knowledge becomes available, nevertheless they can all be distilled as “precise mechanisms through which cooperation can emerge” (Koremenos 2001, 319). I argue that particular attention should be paid to institutional design provisions for flexibility and compliance, which I see as equalizers to each other to promote ratification and ensure fulfillment of state commitments.

As defined above, institutional design features are the central focus of an agreement, encompassing all other design features. The two main subsets I am investigating are flexibility provisions and compliance provisions. The former can be broken down into four main categories of transformative, adaptive, interpretive flexibility, and adaptive flexibility.<sup>16</sup> Compliance provisions entail any procedures which deal with enforcement of obligations, both in terms of dispute settlement and consequences, as well as access to resources to assist states in realizing their goals.<sup>17</sup>

## **Legal Provisions Typology**

### *Flexibility*

Flexibility provisions are generally thought to be useful when there is a level of uncertainty about an agreement itself, or issue coverage concerns, as it allows for modifications after future knowledge is acquired. Many of the flexibility mechanisms I am going to discuss can be incorporated into any type of international agreement, however, I am going to focus specifically on the ways they can be built into MEAs, effectively improving MEA outcomes and agreement success. As the name suggests, interpretive flexibility provisions give member states

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<sup>16</sup> Flexibility provisions are distinct, although inclusive of the flexibility mechanisms created in the Kyoto Protocol which will be discussed in depth in chapter four.

<sup>17</sup> Unlike flexibility provisions, which I refer to as separate from flexibility mechanisms, I refer to compliance provisions and compliance mechanisms interchangeably as there is no terminological overlap in any existing agreements.

room to interpret an agreement's rules and obligations. The first direct way this occurs is through reservations, however, with the case of the three agreements in this paper, reservations are prohibited. Secondly, states have more flexibility to interpret agreements based on how precise the rules are. For example, if an agreement does not give a specific benchmark a state must reach, states have more margin to decide how best to modify their action to achieve the treaty's overall goal. In contrast to reservations which must be made prior to ratification, ambiguity of language gives a lasting source of flexibility to states (Marcoux 2009, 211-212). While vagueness of a text may appeal to states hesitant to join an agreement because the lack of specificity lowers explicit cost, it also risks reducing the legitimacy of the text.

Applicational flexibility similarly gives states more freedom when it comes to implementation. Implementation, not in terms of what their commitments will be, but rather how to implement projects and accomplish their objectives. This is the only category of flexibility not established in previous literature and is one I am creating. The main form of applicational flexibility is financial funds, such as the Montreal Protocol Multilateral Fund or the Global Environmental Facility (GEF). These funds, or other provisions which provide financial or technological assistance to states, give states more flexibility and assistance in how they establish projects as it lifts barriers from lack of resources.

Transformative flexibility gives states the power to adjust their original terms of cooperation over time. To expand:

States may provide transformative flexibility both actively and permissively. In the first case, states may limit the duration of a multilateral agreement such that renegotiation is necessary to sustain cooperation after the initial term expires. Alternately, states may provide transformative flexibility in a more permissive sense, by designing provisions that allow the terms of cooperation to be amended. In this case, states are faced with the further choice of choosing rules to govern the process of adopting amendments. States

may set demanding requirements for the adoption of amendments, such as unanimity or consensus, or more lenient conditions, such as simple majority support. (Marcoux 2009, 212-213)

Most agreements require some level of consensus among member states to pass an amendment, whether it be a majority, super majority, or unanimous. For the case of Montreal, Kyoto, and Paris, voting for amendments typically takes place at the COPs and MOPs respectively.

Lastly, adaptive flexibility gives states the ability to suspend their commitment based on future contingencies instead of adjusting the terms of the agreement. Inclusion of the escape mechanism and withdrawal clause are the most direct form of adaptive flexibility (Marcoux 2009, 211). Both fulfill very similar purposes, however, unilateral withdrawal from a treaty is only permissible if it is specifically stated in the agreement as defined under Article 54 of the 1969 VCLT. All agreements analyzed in this paper have articles which include detailed withdrawal clauses: Montreal Protocol Article 19, Kyoto Protocol Article 27, and Paris Agreement Article 28. The United States notably withdrew from the Paris Agreement after the required three-year delay from its commencement. Withdrawal clauses are not absolute decisions though, and rather allow for states to re-join an agreement, as President Biden initiated on his first day in office. Meeting and negotiation structures, such as the Conference of the Parties (COP) or Meeting of the Parties (MOP), can also provide an informal form of adaptive flexibility to adjust state commitments.

Marcoux (2009) notes that the inclusion of flexibility can be correlated to different dynamics in international relations. He asserts that there are lower amounts of flexibility when there is a significant power asymmetry among negotiating states (226). However, Marcoux categorizes flexibility based on the presence of escape clauses and the degree of consensus needed to make adjustments, which I see as only partial measures of flexibility. Moreover, I see

escape clauses as an inadequate flexibility device for most MEAs, because as Koremenos (2005) points out, “escape clauses do not allow adjustment; rather, they allow states to temporarily escape cooperation and return to an unadjusted agreement” (561). For something as complex as climate change, this is usually too simple a tool and would further risk key states leaving an agreement all together rather than considering reevaluating commitments; a reality made possible by transformative flexibility provisions.

Two other provisions I consider forms of flexibility, but which do not neatly apply to one of the categories above are minimum participation and soft obligations. I consider minimum participation to fit loosely under flexibility provisions because they can be adjusted to allow for agreements to take effect at a lower or higher state participation. This room to adjust when an agreement enters into force gives the treaty itself, not the states involved, more flexibility in enactment. An agreement might aim to have a higher minimum participation rate to encourage more states to ratifying the treaty, however, too ambitious minimum participation risks an agreement never being ratified and never taking effect. The Doha Amendment to the Kyoto protocol, for example, was introduced in 2012, but did not take effect until October 2, 2020, after finally meeting the ratification threshold of at least three fourths of the members of the Kyoto Protocol. Different states and their clout in the international arena influences their preference for the degree of minimum participation. Kesternich (2016) reports that, “small countries with low bargaining power in international climate negotiations call for ambitious membership requirements” because it might help strengthen their position. Whereas larger developed countries tend to “set lower minimum membership requirements but opt for emission thresholds that require all major current emitters to participate in a future climate deal” (1058-1059).

Secondly, soft obligations, which I see as a subset of soft law, could be considered a form of interpretive flexibility, although it does not necessarily mean said commitments are vague. Rather, soft obligations imply general commitment to an agreement without precise targets. For example, the Paris Agreement, while a binding source of hard law, does not set precise aims for states, instead states set their own goals through Nationally Determined Contributions.

While flexibility provisions are an incredibly powerful tool to achieve higher rates of ratification and more meaningful commitment, too much flexibility without precise obligations may incentivize non-adherence to targets, making the MEAs objective unattainable and all but worthless. Therefore, I argue that flexibility provisions can be balanced with compliance provisions to increase the adherence of environmental obligations and therefore the overall environmental goals of an agreement through oversight or assistance.

### *Compliance*

Although not regulatory in nature, I argue that the climate change regime requires intelligent compliance provisions to ensure adherence to obligations. Without a system established to foster both collective support and deter from non-compliance, I do not believe there will be enough incentive, nor infrastructure, to collectively meet the goals of climate change MEAs.

Additionally, the inclusion of compliance provisions can assuage concerns of reciprocal noncompliance from member states, which otherwise would have a net negative consequence on other members (Faure 2020, 58). The first treaty-based non-compliance mechanisms were developed within IEL through the Montreal Protocol. These provisions encourage states to not only face repercussions for their non-compliance, but also accept that their behavior violated the grounds of cooperation. These provisions however are not purely punitive in nature and are trending to include facilitative and resolatory measures rather than an adversarial approach. For

example, the Paris Agreement's compliance provisions are specifically designed to be facilitative rather than punitive; it has yet to be seen if this approach is effective because the agreement has only been in effect for a few years. While I support the notion of compliance provisions leading with facilitative methods, I do believe that there needs to be some level of penalty for states which break their obligations to both give the agreement credibility and minimize future breaches of the agreement. This is one of the reasons scholars suggest the Kyoto Protocol was weak; it did not have adequate compliance measures set up for non-Annex 1 countries (Martimort and Sand-Zantman 2016; Sandler 2017).

As defined by the UNEP, compliance mechanisms can entail the following:

- (1) a requirement for information reviewing national performance of MEA obligations ("performance review information");
- (2) institutionalized multilateral procedures to consider apparent instances of non-compliance ("multilateral non-compliance procedures");
- (3) multilateral measures adopted to respond to non-compliance ("non-compliance response measures"); and
- (4) dispute settlement procedures.

(UNEP 2009, 9)

I agree with Goeteyn and Maes (2011) that the best compliance mechanisms are those which have permanent bodies with standing commitments and support, not just ad hoc bodies. I further argue that the bodies' primary function should not only be punitive, but rather include substantial ways to deal with disputes among states and address states' impediments in attaining their targets. By offering solutions to problems, rather than threatening punitive measures due to lack of resources, a further level of equality is developed amongst states by the access to resources. Furthermore, if assistance is offered, a state may see an additional benefit rather than an inherent

cost when obstacles are confronted, which in turn, makes states more likely to comply with their commitments, or ratify an agreement in the first place. While “the emergence of these mechanisms implicitly highlights the shortcoming of the dispute settlement systems established by multilateral environmental agreements,” these mechanisms are “alternatives rather than replacements for the traditional means of international law enforcement” (Ong 2010, 320). Ultimately compliance is the key for any international law’s success, it is the difference between a state following through with commitments and goals never being met—whether this compliance is garnered purely based on the legitimacy a law has or specific provisions.

## **Conclusion**

Understandably, many are pessimistic about the environment’s future and our ability to collectively come together to find a solution. Furthermore, some see inconclusive science as a preventative measure against action, however, the precautionary principle posits that lack of full scientific knowledge should not cause idleness. In the face of such irrevocable damage as climate disaster, states should be proactive rather than reactive (Peel 2020). While the science may not be confirmed for precise aspects of anthropogenic climate change, it is overwhelmingly and undeniably scientifically supported that the environment is being altered and negatively impacted by a number of human actions, mainly the emissions of greenhouse gases. I argue that a successful MEA focused on climate change is the crux of the solution, but not the entire fight. A comprehensive, equitable, and sustainable agreement must be reflected in, and followed up by, domestic policies and individual measures. While a solution does not end with a successful MEA, it does start with one, and an agreement with balanced institutional design features can maximize the potential for success.

Although many argue that aspects of MEAs are not transferable among agreements, especially across regimes, some design features of successful agreements shed light on possible improvements to MEAs in the climate change regime. It is important, however, to consider the context of each environmental issue and tailor it to meet the exact problem at hand (Young 2011). I argue that while you cannot simply transfer the blueprints of one successful MEA to another, especially across regimes, you can incorporate institutional design features which yield both increased ratification and adherence. Which is why it is valuable to look at the success of various agreements and breakdown what aspects of the agreement—particularly paying attention to its mechanism design—engendered success in terms of participation and adherence to environmental obligations.

### **Chapter 3~ An Assessment of the Montreal Protocol: Key Negotiations, Design Features, and Outcome**

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#### **Important Dates**

| <b>Treaty</b>   | <b>Number of Ratifiers<sup>18</sup></b> | <b>Year Started</b> |
|---|---|---------------------|
| Vienna Convention for the Protection of the Ozone Layer | 198                                     | 1985                |
| Montreal Protocol                                       | 198                                     | 1987                |
| London Amendment and Adjustment                         | 198                                     | 1990                |
| Copenhagen Amendment and Adjustment                     | 198                                     | 1992                |
| Vienna Adjustment                                       | 198                                     | 1995                |
| Montreal Amendment                                      | 198                                     | 1997                |
| Beijing Amendment and Adjustment                        | 198                                     | 1999                |
| Montreal Adjustment                                     | 198                                     | 2007                |
| Kigali Amendment  | 100                                     | 2016                |

(All ratifications, Country Data, UNEP Ozone Secretariat)<sup>19</sup>

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<sup>18</sup> This number includes Palestine and its occupied territories as a member state.

<sup>19</sup> For more visit: <https://ozone.unep.org/all-ratifications>.

## Introduction

It is widely remarked that the ozone regime is one of the most successful international environmental regimes. Most often associated with this success is the Montreal Protocol, a regulatory treaty which at its foundation included binding commitments from member states to reduce their level of production and consumption of ozone depleting substances (ODS). The regime was formed as a reaction to new scientific information from the 1970s that found stratospheric ozone levels—required for maintaining a livable atmosphere and temperature on earth—were being damaged. Although the exact cause of the destruction was not determined initially, there was evidence that CFCs were one of the main culprits. The precautionary clause and the severity of the issue pushed states to be proactive about a solution. Additionally, the collective security threat posed by a weakened ozone encouraged finding a prompt solution.

In 1977 the UNEP adopted the World Plan of Action for the Ozone Layer and within the next decade individual states, including the US, took steps to ban or limit the consumption of ODS, such as CFCs. It was not until 1985 that the ozone regime really began developing in a unified international manner through the Vienna Convention for the Protection of the Ozone layer (Downie 2020, 107). Like most international environmental regimes, the ozone regime used a framework convention model. The Vienna Convention was not regulatory in nature and was formally codified through subsequent treaties, such as the Montreal Protocol. The process of establishing the Vienna Convention took nearly five years. Furthermore, the negotiations revealed schisms within the international community between what was called the Toronto Group and the European Community (Skjøereth 2012, 41). Negotiations were still swift relative to the international environmental legal process and differences resolved.

Now, over 35 years since the first framework, there has been more than a 95% global reduction in the production and consumption of ODS from baseline levels and, consequentially, the ozone has been healing at a steady rate (Skjærseth 2012, 48).<sup>20</sup> The ozone layer over most of the earth's surface should fully recover by 2050 (Downie 2020, 110). The success of the regime has been firmly established, so, what more can be gleaned from the agreement that contributed to such achievements? First and foremost, one should investigate the institutional design structure of the agreement itself, which is the foundation for states to decide how best to accomplish their contributions and commitments.

### **Overview of Agreement**

The first of Montreal's 20 articles includes definitions commonly referenced throughout the protocol; this increases legitimacy as it clarifies vague language and decreases some level of interpretive flexibility as the language has been explicitly defined (Franck 1988, 716). The main objective of the agreement can be summed up as follows: reduce the production and consumption of ODS, specifically targeting CFCs and some halons.<sup>21</sup> In order to achieve this, the protocol also details specific provisions. Some of these provisions include establishing a multilateral fund to provide financial and technological assistance to states, a detailed compliance mechanism, arrangement for annual MOPs in addition to regularly scheduled COPs, and a distinction between developing and developed states in their individual commitments

Prior to the articles of the Montreal protocol, there is a preamble giving collective voice to the states involved with the protocol's creation. The quasi-mission statement both

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<sup>20</sup> Using 1985 as the base year.

<sup>21</sup> The specific ODSs included under the original Montreal Protocol can be found at the appendix of the agreement under "Annex A, Controlled Substances." Later adjustments and amendments to the protocol added additional chemicals under the protocols purview.

acknowledges the environmental issue at hand—the depletion of the ozone—whilst also making firm commitment to combat the problem through specific practices which are expanded upon in the proceeding articles. The most telling paragraph to this introduction is:

**DETERMINED** to protect the ozone layer by taking precautionary measures to control equitably total global emissions of substances that deplete it, with the ultimate objective of their elimination on the basis of developments in scientific knowledge, taking into account technical and economic considerations

This declaration is loaded with many references to the provisions to come, as well as some other core principles to the ozone regime and International Environmental legal system at large. There is reference to the precautionary clause to start, noting that action is better than inaction. There is also a foundation of equity and consideration of state's differing responsibilities and capabilities to commit themselves to the solution, in essence, common but differentiated responsibility. This is visible through language such as “to control equitably,” rather than equally.

The article's substance covers obligations of states, detailed information on how the obligations will be assessed and reported, acknowledgement of differing state capabilities, and equity measures to provide assistance. The articles also state that compliance measures will be created at a later MOP which is further elucidated in Article 11: Meeting of the Parties. At the first MOP there is an agenda of five preparations, plans, and procedures that the members must work through and agree upon. Article 11 also establishes 10 general functions of the parties so that an ongoing meeting structure is prepared.

The Montreal Protocol is a prime example of a more realistic “managerial approach” for international environmental regimes—which at the time was innovative (Faure 2020, 141). A managerial approach uses facilitation as a foundational element of its non-compliance measures and features strong elements of facilitation and capacity building (Faure 2020; Goeteyn and Maes 2011). By building upon the Vienna Convention with specific goals and swift adoption, the

Montreal Protocol was able to establish an effective primary rule system. While the Vienna Convention established a Convention of the Parties, the Montreal Protocol first brought into practice the Meeting of the Parties: a more frequently convening meeting of the member states to overview treaty objective attainment, state methods to do so, and resolve other political matters. MOPs allow for the reevaluation of the protocol and the incorporation of additional design provisions such as those to strengthen compliance, or the strengthening of chemicals to be phased out under the protocol. One of the most valuable abilities the MOP offers is the platform for adding adjustment provisions. These provisions create a great deal of flexibility in adjusting the agreement because, unlike an amendment, adjustments do not need a formal vote or unanimous support, and are automatically applicable to *all* member states that ratified the original protocol (Article 2, Section 9 of the Montreal Protocol). This feature enables parties to respond to new scientific information, accelerate chemical coverage or reduction goals, and strength existing controls on ODS—which all become *binding immediately*. As specified within the agreement, the MOP is one of two annual meeting groups in addition to the Open-ended Working Group (Montreal Protocol). Both the MOP and Open-ended Working Group are assisted by the Ozone Secretariat which oversees many of the functions of the protocol, which all member states must report to (Downie 2020, 107).

### *Members, Commitments, and Negotiating Blocs*

Article 16 of the Montreal Protocol details that entry into force is contingent on not the number of ratifying states themselves, but the total percent of ODS production said states represent.<sup>22</sup> As such, at the time the treaty entered into force, as clarified by Article 16 of the

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<sup>22</sup> The article reads, “This Protocol shall enter into force on 1 January 1989, provided that at least eleven instruments of ratification, acceptance, approval of the Protocol or accession thereto have been deposited by States or regional economic integration organizations representing at least two-thirds of 1986 estimated global consumption of the

protocol, 47 states had ratified the agreement. By including a minimum participation threshold, dependent on emissions, the agreement was able to limit the leakage problem associated with non-signatory countries and minimize free-riding at the extensive margins (Sandler 2016, 348). By having a threshold of 2/3<sup>rd</sup>s of the CFC consumption, a noticeable dent was triggered by requiring commitment from all major consumers. Currently the agreement has been ratified by 198 recognized members and is the first international environmental agreement to achieve universal ratification, a huge feat.

The initial membership in 1989 includes the two main negotiating blocs mentioned in the introduction, the Toronto Group—headed by the US and including Canada, and the Nordic countries (Finland, Norway, Sweden) and Switzerland—and the European Community (EC). The Toronto group was much more ambitious in its phaseout dates of ODSs, specifically CFCs, while the European Community was more hesitant to add strict binding obligations (Chasek and Downie 2017, 112-113). This rift emerged during earlier ozone negotiations and reflected the market situation in which the US consumed most CFCs, while the EC exported most of the CFCs, giving the EC a greater economic trade-off cost in the matter (Sandler 2016, 349; Skjærseth 2012, 41; DeSombre 2001, 56-58). One of the loudest voices for the EC was London, but this division was almost completely healed during the 2<sup>nd</sup> MOP in London in which Britain supported the US's stance to halt CFC production by 2020 (Chasek and Downie 2017, Downie 2020; Sandler 2016).

As of 1990 there were only about 60 member states to the Montreal Protocol, and the negotiations exposed the dominance of the US and Europe in decision making. While the north

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controlled substances, and the provisions of paragraph 1 of Article 17 of the Convention have been fulfilled. In the event that these conditions have not been fulfilled by that date, the Protocol shall enter into force on the ninetieth day following the date on which the conditions have been fulfilled.”

dominated early negotiations, there was also a large number of developing countries which had already signed on at this point, despite their nominal levels of production and consumption of ODSs. One of the reasons for some of the developing countries, such as those in Africa, joining so early on is the leeway and flexibility they were given with their reduction obligations, as well as the fact that most CFCs and ODS were produced in developed countries and more widely consumed in those places such as the EC (Chasek and Downie 2017). This already low level of CFC usage and production created less of a burden for developing countries to join, since their adjustment costs were so much lower.

The Protocol also included elements to address state differences and integrated CBDR through the annex structure. Developed countries were required to begin phasing out the five CFCs and three halons defined under Annex A at the end of the protocol. Furthermore, these developed states were expected to achieve a 50% reduction in CFC consumption by 1998—relative to the baseline year of 1986. For halons, states were to freeze their consumption at 1986 levels by 1993—this was to be achieved within 37 months of the treaty entering into force. For developing countries these same central obligations remained, but with a 10-year grace period given (Montreal Protocol, Article 5). Even with the grace period, non-annex states were still held to standard and were expected to “not exceed an annual calculated level of consumption of 0.3 kilograms per capita” (Montreal Protocol, Article 5). This grace period reinforced the CBDR by holding developing states to expectations, while still acknowledging their varied situation, effectively maintaining equity amongst member states and as a core tenant of the regime.

It should be noted that exemptions also “exist for some countries to continue the production and consumption of small amounts of some ODS for ‘essential uses’ after the phaseout dates” ...and a larger “and more controversial exemptions exist for ‘critical’

agricultural and ‘quarantine and pre-shipment’ uses of methyl bromide” (Downie 2020, 107).

This further differentiation not only made states more likely to commit to cutbacks because of the flexibility given to specific situations, but also increased the perceived level of fairness the treaty had amongst different states.

### **Institutional Design Features and Related Negotiations**

Over the course of a few decades since Montreal’s entry into force, the MOP facilitated numerous adjustments, amendments, and restructuring, in doing so, proving to be an invaluable tool. These meetings resulted in most of the institutional design features above, and more valuably illuminates the international relations which characterized the ozone regime at the time. The various design features of the protocol were innovative and effective, namely in the ways they expanded the treaty’s breadth and depth of coverage. These key architectural elements have influenced proceeding treaties, with compliance panels, reporting requirements, assessment panels, and review procedures mirrored in other agreements’ structures (Downie and Chasek 2017, 114). The treaty’s design features expand beyond the simple buckets of flexibility and compliance mentioned in the previous chapters and are a product of negotiations and state relations shifting over time. Being the landmark environmental agreement it was, in many ways it blazed the trail for future MEAs to expand on these institutional design features and use the meeting framework as a way to structure ongoing negotiations. The compliance mechanisms in the Montreal Protocol in particular became a model for future agreements, while the flexibility provisions are more fluid. This section will discuss some of the most notable design features of the agreement and the consequential negotiations, many of which lead to the design features’ establishments. Discussion will begin with negotiations leading up to the Vienna Convention, continuing on to an analysis of the agreements’ components of flexibility and compliance.

The leading blocs at the start of the ozone regime negotiations were the Toronto group and the European Community. While the two fundamentally wanted to see an end to ozone depletion, they had a discrepancy about the degree of chemical reductions as well as the timeline. Since both blocs were of fairly symmetric power—meaning both blocs had equal influence in terms of their wealth, stature, and contributions to the issue—and the ozone required a solution, negotiation and compromise were expected. During the final stages of negotiations for the Vienna Convention, the Toronto group abandoned the idea of binding controls on CFCs when they thought that the European Community and Japan would not join. This dynamic shows the pitfall of the LCD problem. Since the European Community is a major contributor to ODS production they are a crux to the solution, and therefore restrictions are loosened low enough to appeal to the EC, in doing so diluting some of the strength of originally proposed obligations. While the US and other members of the Toronto group had banned CFCs relatively early and had the ability to influence and possibly encourage asymmetric groups to do the same, the match between Europe and the Toronto was too equal to allow for Toronto to have any leverage over Europe's decision (Downie 2020, 115; Sandler 2016, 351).<sup>23</sup> Although originally over 40% of CFCs were produced in the US, over 40% were also produced in Europe. While the US had already instated strict cutbacks, securing the EC's participation was still necessary for a solution to be reached. Another possible veto coalition formed around large developing countries, such as the BRICS. Although they were not producing many ODS at the time of the ozone regime's formation, they had leverage from the fact that they could produce a lot more in the future (Chasek and Downie 2017, 111). Europe also presented a similar position with their production

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<sup>23</sup> By asymmetric, I mean an uneven match between two powers. In which one state or group has much more power, whether in terms of wealth, resources, or social capital relative to another. This assumes that the more powerful state of the two has more bargaining power against the other and in negotiations. For more in relations to MEAs, see Marcoux (2009) or Koremenos (2005).

cap not yet realized, but to a lesser degree than the cumulative power of the Global South and BRICS.

After the Vienna Convention, the prominence of these two groups during negotiations faded and the members of the European Community eventually agreed to binding reductions for CFCs and other ODS. Much like the Vienna Convention, the Montreal Protocol was also a legacy of these initial negotiations and its design structure was influenced by these negotiating blocs. Many of the consequential provisions for flexibility and compliance resulted from opinions from these blocs.

I will first begin by analyzing some of the most significant flexibility provisions within the agreement and any negotiations which were consequential to the provisions' formations. Arguably, the most valuable element of flexibility in the protocol is what I consider to be the transformative flexibility achieved through annual MOPs and their successive adjustment provisions. These tools are transformative instruments because they allow commitments to be ratcheted up, "both by accelerating phaseout schedules for those chemical already covered and by adding more chemicals to the list of those covered under the terms of the agreement" (Young 2016, 125). The Meeting of the Parties fulfills virtually the same function as the Conference of the Parties but is given the name to differentiate the Protocol from the COP of the Vienna Convention (Montreal Protocol, Article 11). This is one of the simplest mechanisms to increase the transformative flexibility of an agreement while also maintaining some interpretive flexibility in the original text. This method of flexibility also takes into account the resources and capabilities of states and technology to confront the issue at hand; just because a shift might not be economically feasible in the original iteration of an agreement, does not mean it should not be integrated into states obligations once it does become so (Young 2016, 126).

The most outright example of flexibility in the protocol is the adaptive flexibility of the Withdrawal Clause of Article 19. While the treaty does not offer an opportunity to make unilateral reservations, this article does allow states to exit the agreement and relinquish any obligations. However, this cannot be done immediately after entering into force, but rather “any time after four years of assuming the obligations specified in paragraphs 1 to 4 of Article 2” (Montreal Protocol, Article 19). The contingency of upholding certain parts of Art. 2 ensures that if a state ratifies the agreement, they are still held to some standard of adherence. To expand, Art. 2 covers Control Measures, and as such, even states which later withdraw from the Protocol are still expected to comply with their obligations of chemical reductions for the time being.

Another main aspect of the institutional design of the Montreal protocol is the Montreal Protocol Multilateral Fund. First and foremost, this is categorized under flexibility provisions generally. More specifically, I label this as applicational flexibility as it assists states with applying projects and achieving their individual commitments. The fund gives states flexibility in the way they achieve their commitment and simultaneously increases the chance of compliance. Compliance is increased as the perceived direct cost of the obligation is lowered, and states, therefore, feel more confident in their ability to meet their goals (Young 2016, 127). While some investment costs of a treaty are assumed by individual states before entering into a treaty—such as time and resources of initial negotiation and contribution to reserves such as the fund—the fund allows for a greater return as it offers insurance that other states will be able to achieve their end of the bargain (Boockmann and Thurner 2006, 125). In other words, this institutional design feature also has the effect of promoting collective action by offering incentives “to make potential participants view action as yielding positive net benefits,” rather than a net loss from the cost of readjusting industries to meet the new restrictions on

consumption (Sandler 2016, 348). In tandem with the 10-year delayed start given to developing states, these measures help mollify developing countries' concerns toward their inability to achieve such ambitious obligations, and rather "meets the incremental cost to developing countries of implementing the control measures" (Chasek and Downie 2017, 116). The fund not only gives states flexibility (i) in how they achieve their commitments, but also (ii) reduces non-compliance, as the problem of incapacity due to lack of resources and technological abilities is given an acceptable solution (Faure 2020, 138).

The details of the fund, in addition to some other important design features of the agreement, were refined and expanded upon at the 2<sup>nd</sup> MOP in London in 1990. The largest developments, generally, since Montreal's establishment were made during the London meeting as the parties discussed the non-compliance measures, decided upon the exact phaseout dates of the chemicals, and designed the Multilateral Fund; all of which were imperative for the treaty's success. The MOP's report notes include remarks on general negotiating groups but do not cite specific states when recording comments. The meeting resulted in clarified dates for the phaseout of ODSs, requiring that parties completely phase out the production and consumption of the original CFCs, halons, and carbon tetrachloride listed under Annex A of the protocol by the year 2000 and by the year 2005 for methyl chloroform. It is recorded that many developed countries were in favor of accelerated phaseout and even suggested expediting the cutoff date to 1997 for CFCs and imposing further limitations for halons (Report of the 2nd Meeting of the Parties to the Montreal Protocol). There was visible conflict between the north and south during debate, as developing countries pointed out that by having the CFC reductions as they currently stood, many potential investors had to be turned away. Another inequality was pointed out by developing states, in that, "developing countries were being asked to reduce production and

consumption to a level 70 per cent below that of developed countries” (Report of the 2nd Meeting of the Parties to the Montreal Protocol, 6). Partially in response to these specific concerns, and partially due to the belief that strengthening the protocol must also be consistent with *equal* global development, discussions pivoted to the Multilateral Fund.

The fund was monumental in addressing the demands of developing countries such as China and India. Although both countries—in particular China—can be thought of today as growing world powers, at the time of the MOP in London they were only beginning to develop more rapidly. Both countries were comfortable members of the global south, and the establishment of the fund was proof of not only the south’s collective power, but also the recognition and commitment from the north of CBDR and the need for a collective equitable solution (Chasek and Downie 2017, 116). The north acknowledged that much of the problem fell at their feet and, therefore, they were to bear more of the burden in terms of cleanup. The notes from the London MOP under the general debate subsection, number 27 records:

A number of representatives of developed countries referred to their country's responsibilities on the "polluter pays" principle. Some stated that their country's contribution to the Multilateral Fund would not in any way affect their other development assistance programmes. With regard to fixing contributions to the Multilateral Fund, a number of delegations proposed the use of the United Nations scale of assessments while others proposed a scale based on 1986 consumption of controlled substances. On the matter of "equitable sharing", several representatives mentioned the need for financing without conditionality while one suggested that guidelines were required in order to ensure that country studies, which were used for assessing incremental financing and for identifying the needs of developing countries, were made on a comparable basis, with the assistance of consultants (Report of the 2nd Meeting of the Parties to the Montreal Protocol, 7).

While developing countries seemed to be receptive to these comments from developed countries, they also expressed suspicion towards the north’s following through with such commitments.

Under “Decision II/8 Financial Mechanism,” the fund and its details were confirmed (Report of

the 2nd Meeting of the Parties to the Montreal Protocol, 10-12). The fund is replenished every three years and is under the oversight of an Executive committee, creating further vertical regulations and aspiring for greater equity among member states.<sup>24</sup>

The Protocol was not just proficient because of its effective incorporation of flexibility provisions, but rather because of the balance it struck between the flexibility and compliance measures. The Protocol incites compliance by offering assistance through the fund and by constructing a non-compliance structure which is facilitative rather than adversarial. Compliance and non-compliance are two edges of the same sword, both elements function to keep states on track to follow through with their commitments and agreements in the protocol. A non-compliance structure was introduced under Article 8 of the agreement and a comprehensive version established at the first MOP (Montreal Protocol, Article 8: Non-compliance, 1). These compliance measures were adopted at the 4<sup>th</sup> MOP in Copenhagen in 1992 under Annex IV and V; this was the next noteworthy MOP since London. The non-compliance procedures encourage states to reach out themselves if they are having difficulty achieving their commitments. Furthermore, the measures taken if non-compliance is continued rest on assistance rather than punitive measures—suspension is the last resort.

Another important result of this MOP was the establishment of the Implementation Committee for non-compliance. One of the most useful design features of the non-compliance mechanisms were the creation of the “essential use exemptions.” Some negotiating blocs resisted including an exemption—such as third party non-governmental actors—insisting that it weakened the overall aim of the protocol to halt the depletion of ozone. However, without the exemptions, commitments would have been even lower because states would have been

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<sup>24</sup> The fund’s design is further elucidated on pages 27 to 28 of the report, under Article 10: Financial Mechanisms.

unwilling to agree at all and no consensus reached. If compromise was not reached, the integrity of the treaty would have been weakened to an even greater extent (Report of the Fourth Meeting of the Parties to the Montreal Protocol, 11). In other words, “while providing a loophole, the inclusion of exemptions was a way to overcome the lowest-common-denominator problem” and avoid states from vetoing faster phaseout dates (Chasek and Downie 2017, 118). In some ways, this flexibility is akin to the interpretive flexibility offered by reservations to an original protocol. However, since the Montreal protocol does not allow for reservations, and the essential use exemption is much more specific, there is a greater balance between offering flexibility and still maintaining the goal of the agreement.

The Implementation Committee consists of ten representatives elected by the Members of the party and takes into account equitable geographic location. The group accepts submissions from states against other members, as well as for the state reporting about themselves, and are responsible for not only reviewing the submissions and their general quality, but also the reliability of the data reported by the member states (Faure 2020, 146). By reconceiving of traditional noncompliance standards, states have more incentive to self-report; such admissions do not automatically lead to sanctions or punishment, but rather remedies and support. In other words, “in this managerial approach, reporting noncompliance should not be threatening, in fact, it may well be in the state’s interest” (Faure 2020, 146).

Another significant result of MOP-4 was another strengthening in control measures: methyl bromide was added to the list of restricted chemicals and a discussion of including HCFCs took place. The way discussions were presented allowed for opening remarks from the scientific assessment panel before state representatives voiced their concerns. While the economic and technological situation of tighter restrictions seemed viable for developed

countries, developing countries were concerned that they would not have affordable access to such chemicals during the ten-year delayed grace period of phase-out that they were granted. A primary concern between the north and south throughout such debates centered around the economic implications and the greater fragility the south had when it came to reductions (Report of the Fourth Meeting of the Parties to the Montreal Protocol, 10). The phaseout of any chemical, or transition to alternative chemicals—which may be more expensive—creates more instability for the south as they have less financial resources to begin with, couples with less advanced industry practices. As for HCFCs, the 1990 London Amendment resulted in a non-binding agreement that HCFCs would not require a phase-out until the year 2040. Compared to the early negotiations of the Ozone regime in the 70s and 80s, by the mid 2000s, the EC and US had largely reversed their roles. The US no longer took the lead in pushing for tighter restriction, but rather the EC began advocating for accelerated phaseout dates—particularly in HCFCs. While the south maintained their concerns that such additional restrictions would hamper their economy, the US and Australia now joined forces in an opposing veto coalition (Chasek and Downie 2017, 118). The newly formed veto coalition of China, India, Australia, and the US argued that “further restrictions on HCFCs would not reduce damage to the ozone layer enough to justify the extra economic costs” of agreements to accelerate ODS phaseout schedules, and this stalemate continued until 2007 (Chasek and Downie 2017, 118). This timeline was later reduced to the year 2030 during the 1992 Copenhagen MOP, which demonstrates the Protocol’s ability to strike a balance between high commitment, realistic demands of industry, and state’s concern; both minimizing the adjustment cost and achieving the overall objective of reduction (Gareau 2010, 219).

The last MOP I am going to discuss is MOP-19, which took place in Montreal in 2007 and resulted in an adjustment provision. This meeting marked the twentieth-year anniversary since the Montreal protocol entered into force and was one of the last MOPs to result in any significant increasing of restrictions. In a surprising turn of events, this MOP marked the end of the HCFC stalemate and accelerated the phaseout by a full decade (Chasek and Downie 2017, 121). What is noteworthy about this advance is that HCFCs are not only ODS but also GHG, and the cutbacks showed a shift in attitudes of states. The connection between the ozone and climate change regime is evident in the repeated reference to the overlap in the MOP notes, and specific role HCFCs played in terms of the Kyoto Clean Development Mechanisms (Report of the Nineteenth Meeting of the Parties to the Montreal Protocol, 16-17).<sup>25</sup> The US resumed its role as a lead negotiator and proponent of tighter restrictions, both because the situation had become more affordable with technological advancements, and also to present itself positively to the international community as an earlier leader in climate change (Chasek and Downie 2017, 119).

The ability to repeatedly redefine and specify the agreement through the MOPs further increases the legitimacy of the treaty. Furthermore, the primary rule system of the Montreal Protocol was built up by amendments that provided more substance—which could be thought of as secondary rule systems—that induced even more compliance (Faure 2020, 138; Franck 1988, 729).<sup>26</sup> Moreover, the oversight of compliance was simplified by monitoring a few producers rather than thousands of consumers, which made the entire process more practical to successfully execute (Faure 2020, 144). As noted, the Protocol aimed to oversee production, not consumption,

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<sup>25</sup> The Kyoto Clean Development Mechanisms will be discussed more in depth in the next chapter, but is one of the flexible mechanisms, supposedly based on the Montreal Protocol and the Multilateral Fund, yet not as successful in implementation.

<sup>26</sup> By primary rule system I am referring to the original and prime authority the protocol has through its binding obligations. Any amendments create vertical reinforcement as a secondary set of rules which build upon and reinforce the values in the protocol, therefore reinforces its legitimacy.

of ODS. Because only a dozen or so states, and within those states only a handful of companies, produced ODS, it was much easier to keep track of than the array of consumers.

There are a number of other factors which have little or nothing to do with the design structure of the treaty itself, but which contributed to its success. Most vitally for the ozone regime, many of the chemicals responsible for ozone damage were produced by a small number of corporate interests and most had easily replaceable substances; this led to a relatively small shift in behavioral change and therefore a lower cost overall, which aided in the overall level of compliance (Faure 2020, 137). The situation has an easily accessible and affordable direct substitute, this lowered the adjustment cost as less work needed to be put into research or directly into covering the transition. Therefore, the overall feasibility of achieving the goal was increased and consistently the likelihood of non-compliance decreased because of the reduced difficulty. The balance present between industry and societal demand for the services previously provided by ODS was achieved through the “protracted transition to ozone-free production,” rather than an immediate ban. The balancing of demands can be attributed to the design of the treaty and not the chemical at hand (Gareau 2020, 219). Secondly, the collective action of states combining their efforts was behind the success of the Montreal protocol and the fact that influential states took the lead on banning CFCs prior to the agreement’s constructions, was immeasurably helpful in mobilizing support (Sandler 2016, 348)

## **Conclusion**

The progression of increasingly tightened restrictions facilitated by the MOP supports Young’s theory that IEAs should begin in a modest fashion and gradually be made stricter to achieve an agreement’s aim (2011). The resulting institutional design offered selective incentives and punishments in the form of the Multilateral Fund and non-compliance mechanisms

respectively; these jointly increased the number of states who viewed participation as a net benefit (Sandler 2016, 361). While negotiations demonstrated a schism between the north and south, and initially between the Toronto group and European community, the MOPs proved to be an effective platform for resolving differences. The institutional design balanced flexibility and assistance. This, in turn, appeased concerns from developing states, and EC, on the economic impact of reductions, while the non-compliance mechanisms facilitated non-adversarial resolutions to challenges. From the first MOP in the 1990s to MOP-19 in Montreal in 2007, the growing power of the south is evident in their stance during negotiations. By MOP-19, for example, China and India had become fierce opponents of phasing out HCFCs and had much more influence during negotiations because of their growing stature. In exchange for a political commitment to assist China and India financially, in other words ensure their continued growth in spite of restrictions, a *détente* was reached in 2007 and the south agreed to binding restrictions on HCFCs.

Not only did the Montreal Protocol herald the first universal participation of any international environmental regime, but it also confronted the growing calls for CBDR. Nothing was more instrumental to this success than the MOPs and their ability to craft a well-functioning institutional design and a managerial approach to international environmental solutions. The ozone is on track to fully recover by 2050 and has already demonstrated incredible progress with worldwide ODS consumption falling by more than 97% (Skjøerseth 2012, 41); there has to be another regime more successful both in terms of process and outcome.

## Chapter 4~ An Assessment of the Kyoto Protocol: Key Negotiations, Design Features, and Outcome

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### Important Dates

| <b>Treaty</b>   | <b>Year Started</b> |
|---|---------------------|
| Rio Conference  | 1992                |
| United Nations Framework Convention on Climate Change enters into force | 1994                |
| COP-1 Berlin  | 1994                |
| Kyoto Protocol Adopted  | 1997                |
| Marrakesh Accords   | 2001                |
| Kyoto Protocol Enters into Force  | 2005                |
| Bali Roadmap  | 2007                |
| Copenhagen Accord   | 2009                |
| Cancun Agreement  | 2010                |
| Doha Agreement  | 2012                |
| Paris Agreement   | 2016                |

### Introduction

Even more so than the ozone problem, climate change has proven to be relentless in its reach, indiscriminately effecting every corner of the planet and every country—no matter how much they have or have not directly contributed to the problem. It is a global commons issue at its core, the consequences of inaction leave no state un-scathed (Sandler 2017, 352). Most pessimistically, while climate change is the most existential threat humanity has ever faced, unlike the ozone regime, it has not born any successful solutions. Much like the ozone regime, the climate change regime is a framework convention model, beginning with the United Nations Framework Convention on Climate Change (UNFCCC) in 1994 which created the basic architecture to address climate change and showcased global environmental efforts. Against the wishes of the veto coalition lead by the US, a few years later the Kyoto Protocol was adopted

and then entered into force, setting specific binding obligations guided by the principles laid out in the UNFCCC (Betsill and Fiske 2020, 276; Chasek and Downie 2017, 166).

While both Kyoto and Montreal required behavioral change from states, comparatively far fewer players were culpable for the majority of the ozone problem—resulting in a lower overall behavioral change and at a lower cost to states and individual actors. On the other hand, climate change does not have one, or even a few chemicals and industries that can be held responsible for the issues at hand. The While category of chemicals responsible for climate change, GHG, is a comparable grouping to the list of chemicals to blame for the ozone problem to ODS. However, any comparisons end there, as the number of chemicals which fall under GHGs far exceed the list of ODSs—even ozone at the tropospheric level is considered a GHG). With more players contributing to the problem and more chemicals to reduce, this requires more players committed to adjusting their behavior to find a solution. This would be a tall order for most international regimes, but with one as connected to the global economy as the fossil fuel energy sector and related industry, the task is even more daunting.

Although scientific evidence of anthropogenic climate alteration dates back as far as the late 1800s, political conversation on the topic did not gain international prominence until the 70s and 80s (Chasek and Downie 2017, 163). Consequentially, the policy formulation of the climate change regime formally began with the UNFCCC in 1992 (Andresen and Boasson 2012, 49; Chasek and Downie 2017, 162-163). In the three decades since negotiations began, there have been dozens of multilateral environmental agreements building upon the convention and hundreds more unilateral commitments made by individual states.

This chapter will proceed by briefly connecting the UNFCCC to the Kyoto Protocol and then unpack the objective and key components of the Kyoto Protocol, including its members and their commitments. It will then proceed to concentrate in depth on the protocol's institutional design features, with a particular focus on flexibility and compliance. The Marrakesh Accords will be discussed in this section, although they were conducted in the interim between Kyoto's adoption and entering into force. The design structure will be discussed in relation to the significant negotiations which helped construct them.

### *UNFCCC to Kyoto*

The framework convention's articles collectively outline a clear structure for future agreements, such as the Kyoto Protocol, to build upon. Included in the Convention's articles are establishment for some of the institutional design mechanisms central to the Kyoto Protocol, such as financial mechanisms for assistance and technological transfer, as well as dispute settlements, and subsidiary bodies. The second article, titled "Objective," speaks to the huge task at hand and the wide-reaching ramifications of climate change. Unlike ozone, climate change does not affect one feature of the natural system so neatly, but nevertheless a culprit emerges in the form of GHGs. As such, the main objective of the convention is the "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system." As is true of the framework convention system, future protocols or "legal instruments that the conference of the Parties may adopt," are to build upon this objective. This is reinforced by the brief preamble to the Kyoto Protocol which reiterates that the members of the Kyoto Protocol are first and foremost members of the UNFCCC and their commitment to the Protocol follow in line with that of the Convention. These elements

all add further levels of legitimacy with concise and specific language through the definitions and a reiteration of principles and obligations; in other words, adding some elements of a secondary rule system (Franck 1988, 716 and 729). Under article three, “principles,” many of the same core tenants established in the ozone regime are echoed: common but differentiated responsibility, the precautionary principle, polluter pays, and collective action.<sup>27</sup>

One of the most significant COPs of the climate change regime characterizes America’s adversarial stance, COP-1 in Berlin. While the US under President Clinton’s leadership initially agreed to set emission limits for a set period, as detailed in a later protocol, the US Senate forcefully pushed back. They passed a unanimous resolution in 1997 calling for Clinton to not agree to any reductions, seeing the decision as ultimately unfair and injurious to the US and its industries; most critically on the grounds that the protocol would essentially make developing countries exempt from any real restrictions (Sunstein 2007, 25). The political tides turned into even more clear disfavor of Kyoto under the Bush administration, in which the president called it “fatally flawed,” pointing to the lack of participation from developing countries as a real deal breaker. While addressing the fact that the protocol’s commitments “exempts 80% of the world,” Bush specifically calls out China and India, directly inciting the tension between the US and the rising powers of the East (Sunstein 2007, 28; Betsill and Fiske 2020, 283). This can be thought of in terms of the developing countries being free riders to the protocol and its associated reward, while other developed countries would be at a comparatively much higher cost with their binding commitments, a jeopardy the US was not willing to take.

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<sup>27</sup> In the ozone regime this preamble and related definitions, which give more legitimacy to the agreement through a secondary rule system and precise language/definitions, is present in the Montreal protocol itself, not the framework convention as it is in Kyoto. This decision could be evidence that the international community realized the importance of including and establishing this foundation at the beginning of the policy formation process.

The Kyoto Protocol negotiations began in the 1990s, and the agreement was adopted in 1997. However, the treaty did not become effective until 2005 when it reached the minimum participation for entry into force—no less than 55 parties to the UNFCCC which include parties under Annex I and account for a total of at least 55% of all CO<sub>2</sub> emissions (Kyoto Protocol, Article 25; Sunstein 2007, 4). Just over a decade after the UNFCCC was first created in Rio, the protocol looks like the beginning of meaningful climate action with the first binding agreements for top emitting states.

### **Overview of the Kyoto Protocol**

While there are many important elements to the climate change regime, this chapter focuses on the most consequential agreement, the Kyoto Protocol.<sup>28</sup> It is more detailed compared to the Climate Convention and more substantive in its institutional design mechanisms, and importantly deviates from the soft law and non-legally binding emission reductions on developed nations. The structure of the agreement can be divided roughly into the following categories “1) emission commitment levels; 2) methodologies for estimating emissions; 3) commitments regarding emission reductions and climate change adaptation; 4) procedures for ensuring compliance with commitments and addressing non-compliance; and 5) transfer of resources from developed to developing countries” (Andresen and Boasson 2012, 52). These sections follow in suit with many of the elements found in the Montreal Protocol: first standards for emission reductions, non-compliance measures, and addressing of developed versus developing countries.

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<sup>28</sup> I consider Kyoto to be most consequential because it was the first international effort to set specific emission reductions binding upon states in aims of mitigating the impact of global warming. While Paris and subsequent agreements set other specific binding targets its notoriety comes from it being the first to do so, setting certain standards along the way.

Yet, while modeled on the Montreal Protocol it will be unpacked how the two could have resulted in such different outcomes.

### *Members and Commitments*

The member states and their commitments are where the greatest initial divergence occurs between the ozone regime and the climate change regime. While the Montreal Protocol acknowledged the CBDR of developed versus developing states with its allotment of a 10-year grace period for developing countries, the Kyoto Protocol took it one step further. Kyoto created an Annex system for member states, under which only Annex I states were given specific binding commitments and required to submit an annual review. Non-annex states to the agreement were held to the same obligations detailed in the UNFCC and Kyoto Protocol, but they had no binding obligations to specific targets, and less frequent reporting to the secretariat.

Under the Annex system, there was an upper limit for either individual or aggregate emissions of GHG capped at 5% below 1990 levels by 2012 (Kyoto Protocol, Article 3). Additionally, under Annex B of the protocol there is a list of states with their emission reductions commitments.<sup>29</sup> As Annex B lists, certain countries were allowed to increase their emissions, including Norway, Australia, and Iceland.

There is a further division amongst non-annex countries differentiating between small developing island nations, oil producing developing states, and the least developing states (Melkas 2007, 270). These states all have special consideration under the Kyoto Protocol and UNFCC because of their particular vulnerabilities—whether economic or geographic—which

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<sup>29</sup> It should also be noted that originally the US was under the Annex B countries even though they never formally ratified the treaty, and therefore, were not subject to any binding commitments.

position them to be more liable to suffer from either the consequences of climate change itself or the economic transition caused by lowering emissions (Von Stein 2020, 246-248). Simply by acknowledging the unique positions each state was in further developed the notion of CBDR. The differentiation gave even more flexibility than a simple Annex and non-annex country list, giving more insight into how each state plans and needs to address climate change. Also included in the Annex was the list of GHGs included in the emission reductions coverage: carbon monoxide, methane, nitrous oxide, sulphur hexafluoride, hydrofluorocarbons, perfluorocarbons (Kyoto Protocol Annex A).

As of 2018, 192 of the 197 states party to the UNFCCC have ratified the Kyoto Protocol. The five states recognized by the UN which have ratified the UNFCCC and not the Kyoto Protocol are: Andorra, Canada, US, South Sudan, and the State of Palestine. Most notable on this list are the US and Canada, which collectively accounted for 16% of global GHG emissions in 2017—the US emitting 14% of the 16% (Chasek and Downie 2017; Ritchie and Roser 2020). While the US never formally ratified the Protocol, Canada initially did, later withdrawing officially in 2012 (Savaşan 2017, 186). Without these two key players—crucial because of their large contribution to aggregate global emissions and their influence globally and regionally—it is difficult to envision global emissions reducing to the level needed to limit warming by 2% (as decided by the Cancun agreement).

### *International Relations*

During climate change negotiations, a natural division emerged early on between states with few native GHG producing industries—and consequentially were dependent on imported energy—and states that high levels of domestic production of cheap fossil-fuel produced energy.

The former included Japan and most states in the EC. The latter included Brazil, China, India, Mexico, Canada, and the United States (Chasek and Downie 2017, 166). There was also a smaller coalition of states whose economy was highly dependent on fossil fuel export: The Arab oil states, Australia, Norway, and initially the UK (Chasek and Downie 2017, 166). During the initial negotiations of the ozone regime the EC was hesitant to make specific commitments while the US and Canada pushed for earlier and more aggressive commitments. The climate change negotiations mirror a reversal of the initial positions of states during the ozone regime.

Other key blocs were that of the south vs north and G-77, as well as the Umbrella coalition. The former is a standing coalition in the UN and includes many developing states and non-annex countries member to the protocol and is representative of the global south. The Umbrella group is an ad hoc bloc formed specifically during climate change negotiations post UNFCCC and during Kyoto. Although a nonformal list, member states to the group include: Australia, Canada, Japan, New Zealand, Norway, Russia, the Ukraine and the US. With the exception of Japan and a few other import reliant states, most members can be thought of in the industrial paradigm above as high producers of cheap fossil-fuel energy. The name comes from their collective desire to be sheltered and protected from the EC position (Kesternich 2016, 1053). There is some overlap between the G-77 and Umbrella coalition, however, two of the leading voices of the G-77—China and India—had a conflict of interest at times as their opinions about developing states' roles often went against the view of other members of the Umbrella Group. As Depledge and Terhalle (2013) have pointed out, the great-power politics between the US and China have stalled many environmental negotiations. As a product of this competitive relationship, the US took an adversarial stance toward Kyoto and refused to commit itself to an agreement which would impose binding commitments on themselves and not on China. While

China ultimately ratified the protocol and the US did not, the US, as the informal leader of the veto coalition, was still one of the most influential players in early negotiations.

Similar to the posture the European Community took during initial negotiations of the ozone regime, the United States was hesitant to ratify anything with forceful commitments or restrictions on *all* members. Although they were the first developed nation to actually ratify the UNFCCC, one of the main reasons it lacked binding commitments was because of pushback from the US (Sunstein 2007, 24). The clout that the US has as an international powerhouse, generally speaking, as well as one of the top three emitters to GHG makes them a crucial piece to the climate change puzzle—one whose voice and opinions carry a lot of weight. This is why it should follow that during initial negotiations on the Kyoto Protocol the US' support for the inclusion of flexibility mechanisms was heeded, even though the US never actually ratified the protocol (Betsill and Fiske 2020, 286).<sup>30</sup>

After agreeing to negotiations about the protocol, the US, supported by the Umbrella group, pushed for more inclusion of flexible mechanisms and emissions trading. These countries saw the flexible mechanisms as a more palatable way to reduce their individual cost of commitment. The EC, and most developing countries, stood in opposition to this and worried that too much of an emphasis on the flexible mechanisms would allow developed states to avoid meaningful commitments (Betsill and Fiske 2020, 286; Marcoux and Urpelainen 186-187). The tension between the south and north is the most influential division to climate change negotiations outside of the unilateral power the US wields. Without the support from the top

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<sup>30</sup> The opposing parties to this adjustment- the EU and developing countries- accepted the terms at the benefit of the US supporting reductions generally. This demonstrates the cost benefit analysis of flexibility mechanisms, while they can increase parties to an agreement, they can also weaken the objective.

emitters of the north, the problem is unlikely to be solved anytime soon, but with the south containing many developing countries with growing industries with clear potential to emit substantial GHG in the future they are also an essential part to a sustainable solution. However, the south has had much hesitancy to join onto an agreement which addressed a problem they see themselves as largely victim to, with very not at all responsible.

Sandler (2017) argues that the effects of climate change are felt evenly across states. However, this argument is flawed in that it both overlooks the uneven distribution of climate consequences geographically, and the unequal contribution to total GHG emissions by states (Najam 2020; Chasek and Downie 2017). This difference is effectively acknowledged by the Annex system for state commitments in the Kyoto Protocol. Furthermore, the current cost climate change poses—from the cost of repairing physical damage to reduced agricultural efficiency and new technology—estimates lowering GDP of developed nations by 1% or 2%, and by more than 5% for developing nations (Sunstein 2007, 32).

While the Annex system was supposed to create some equity and reaffirm CBNDR amongst states, the reality of particular targets was that they were very much a result of self-interest. Many top emitters were either not party to the agreement—United States and Australia—or were not under the Annex system and thus had no binding obligation—China and India. Evidently, most of the specific reductions states agreed to were at, or minimally above, what they had already achieved as a result of other developments. For example, Russia over delivered its promised reductions due to economic hardships that reduced their normal production levels, producing only 70% of their 1990 emission levels when they were apportioned up to 100% (Sunstein 2007, 27). Similarly, when Germany re-connected to its former East

Germany—which had low emission levels—the state’s merged emissions dropped to less than 10% Germany’s. This reveals the lack of ambition that the protocol was able to garner (Sunstein 2007, 27). While it was monumental in and of itself to establish an international agreement with binding commitments, the structure did not subvert individual state interests or international conflict enough to achieve major success.

### **Kyoto Institutional Design Features and Related Negotiations**

As argued in the previous chapter, the institutional design features of the Montreal Protocol, notably its balance between compliance and flexibility, was essential to its success (Faure 2020, 152-153). The institutional design of the Kyoto Protocol was purportedly modeled after this approach to compliance and flexibility in the Montreal Protocol (Sunstein 2007). If this is the case, then why have scholars accused Kyoto’s design as being riddled with flaws and a main culprit for its failures (Sandler 2016, 353; Rosen 2015, 31)?

#### *The Marrakesh Accords*

After the Kyoto Protocol was adopted in 1997 the next prominent COP was in 2001 at COP-7 in Marrakesh, also known as the Marrakesh Accords. The Accord was a regulatory starting point and detailed some of the financial provisions of the regime as well as focused on the compliance mechanisms that supplemented the commitments made by developed states in the Protocol (Savasan 2017, 155; Melkas 2007, 264). This was not an amendment to the Protocol but did discuss more details of the agreement (Andresen and Boasson 2012, 56). As such, the Accord preamble states:

*Recommends* that the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol, at its first session, adopt a decision containing a framework on

capacity-building that reaffirms the framework annexed to the present decision with additional reference to priority areas for capacity-building relating to the implementation of the Kyoto Protocol.

Some features established within the Accord were directly integrated into Kyoto, such as the financial mechanisms. To supplement the financial assistance offered through the Global Environmental Facility (GEF), Marrakesh established three other funds: the Special Climate Change Fund (SPCCF), Least-Developed-Country Fund (LDCF), and the Adaptation Fund (Wirth 2002). Importantly, the first two operate in pursuant to the UNFCCC, while the Adaption Fund is specifically run through the Kyoto Protocol. All three of these funds, in addition to the GEF, are flexibility provisions, specifically they are labeled as applicational flexibility. All of the funds offer states considerably more resources to achieve their individual and collective goals. The Special Climate Change Fund is more sweeping than the other two, designed to finance projects and advance technology in different industries in order to diversify the economy (Chasek and Downie 2017, 178; Betsill and Fiske 2020, 287). The LDCF helps the least developed countries prepare and implement national projects, but it does not specifically assist with adaptation (Chasek and Downie 2017, 178; Betsill and Fiske 2020, 287). The consequences of this are that parties to the convention, and not the protocol, are still eligible to receive or contribute to financing. A symbiotic relationship was formed by the CDM and Adaption Fund, wherein certain proceeds from the developments were directly applied to the Adaption Fund (Wirth 2002, 651). These examples of applicational flexibility establish more equity amongst member states as developing countries are offered the assistance, they need to implement emission reduction projects. In other words, the funds even out the playing field.

In addition to the financial funds, there were also some compliance provisions formalized during the Marrakesh Accords. Similar to Montreal, Kyoto's compliance provisions were

designed to include non-adversarial elements, however, it creates a more elaborate compliance system by establishing two separate branches: the facilitative and the enforcement branches (Faure 2020, 152-153). The enforcement branch doles out consequences for noncompliance that were established collectively by member countries if they fail to reach their target. A noncompliance investigation is triggered if the expert review concludes their oversight with what is known as “questions of implementation.” Those states found in non-compliance for not submitting their state’s progress report were punished by becoming ineligible to use the Kyoto Flexible Mechanisms (which will be discussed in the next section) (Betsill and Fiske 2020, 286-287). The more nonadversarial of the two is the facilitative branch. Similarly to Montreal’s compliance provisions, it is tasked with assisting *all* countries in their implementation of the protocol. Compared to the enforcement branch, the facilitate branch has been utilized less frequently. This could have been in response to Montreal which lacked any true enforcement mechanisms in aims of achieving greater aggregate success by holding states accountable (Goeteyn and Maes 2011, 816). The branch of enforcement was partially reactionary to the lack thereof in Montreal and was included to deter non-compliance before it even happened. The enforcement branch’s threat of potential punishment for non-compliance would encourage states to seek facilitation if they cannot achieve a goal. However, as an immediate safegaurd against too much flexibility, it does little to address the way states can exploit these provisions.

In part due to the political push back from the Umbrella Group on binding legal consequences, the Marrakesh Accords deferred the question of the legal form of compliance until the first MOP after Kyoto entered into force (Wirth 2002, 655). This decision showcases the continued power developed countries had in negotiations, especially at such a crucial and precarious case in the regime. Even though Kyoto had been adopted, it had not entered into force

and relied on the continued support from developed states to do so. The results of Marrakesh with the financial funds and the compliance mechanisms dually show the regimes approach to balance concerns of the south alongside the north.

### *Kyoto Flexible Provisions*

Independent of the typology I have assigned in this paper for flexibility provisions, the Kyoto Protocol formally established flexible provisions known specifically as the Kyoto Flexibility Mechanisms: clean development mechanisms (CDM), joint implementation (JI), and international emissions trading (IET). To briefly unpack these, the CDM allows for *industrialized* countries to invest in emissions reducing activities in *developing* countries in exchange for a certified emissions reduction applicable towards their personal emissions target (Kyoto Protocol, Article 12). The stated purpose of this mechanism is “to assist Parties not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the Convention, and to assist Parties included in Annex I in achieving compliance with their quantified emission limitation and reduction commitments under Article 3” (Kyoto Protocol, Article 12). Emissions trading allows *developed* states listed under Annex B, that *exceed* their allowed emissions, to purchase unused emission credits from other *developed* states to help meet their domestic targets (Kyoto Protocol, Article 17). Lastly, JI is similar to CDM in that it allows states to invest in other countries, however, this occurs between *developed* countries, not developed investing in developing. These mechanisms are designed to be beneficial for all parties involved, however, the benefits is most valuable to developed countries under Annex I, as the investing country is the party to receive an emissions reduction credit to apply to their individual target (Kyoto Protocol, Article 6). It is important to highlight that these

flexible mechanisms were intended to be supplemental to meeting domestic actions taken to reduce emissions in Annex-I countries' own land. The goal was rather to make the overall success of the Protocol more achievable and equitable. During initial negotiations it was a concern of developing countries and the EC that these provisions would encourage states to avoid ambitious personal commitments. However, the Flexible Mechanisms were not *intended* to be the primary focus of the agreement nor the main path for achieving individual commitments.

All of the Kyoto Flexible Mechanisms are categorized as interpretive flexibility because of the leeway the mechanisms give states in how they decide to achieve their overall commitments. In other words, the mechanisms effectively allow states to have more freedom in how they calculate their individual state commitment (Betsill and Fiske 2020, 285-286). By offering the mechanisms but not requiring their use, states are able to use the mechanisms as they see fit, giving states more authority in the overall realization of their targets. On the surface, the Flexible Mechanisms would offer more reassurance to the south that their position as developing countries would be situated at the center of discussion about projects and assistance would be directly offered to them. However, the south was hesitant to include heavy emphasis on Flexible Mechanisms because of fear of their misappropriation.

While the mechanisms were included as a way to create more equity amongst Annex and non-annex states, as well as avoid non-compliance by giving alternative options for individual success, as Melkas (2007) points out, they risked being counterproductive to these aims. Many of the mechanisms were exploited by wealthier countries and not only undermined their individual commitments, but disincentivized developing countries to themselves invest in projects in their own country. As a result of developed countries capitalizing first on all of the cheap options for

implementation, developing countries were left with less affordable options themselves (Melkas 2007, 284-286). In theory, the CDM offers a unique tool that can both help remedy capacity problems by providing financial and technological aid to developing countries, while also reducing compliance costs for the developed country by giving them a cheaper alternative to buy emission rights (Faure 2020, 139). However, in practice this has not been the typical case. An incentive emerges for states to elect to use CDM rather than investing in emissions reduction in their own country, in effect diluting the objective of lowering their own emissions. Since developed states are generally larger contributors to global GHG emissions than developing countries, a project in a developing country would be less impactful than one in a developed country. This is a particularly attractive option as states would opt for the lowest marginal cost of production.<sup>31</sup> Taking a pragmatic approach of self-interest, certainly most countries would invest in the cheapest options to achieve their obligations. However, this is a luxury reserved for wealthier nations. Those countries which utilize CDM are cross listed under Annex I, whereas those developing nations where the projects take place are not included under Annex I. The implication of this difference is that the developing countries—where CDM projects would be located—have no binding obligations to meet and therefore less incentive to invest in their countries. As a result of CDM being exploited, the most affordable options for emission reduction has already been capitalized on my developed countries, and developing countries have not only less incentive, but fewer viable options to achieve their own individual goals (Faure 2020, 140).

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<sup>31</sup> A marginal cost of production is any additional cost incurred by performing a task. Since developing countries are often cheaper to implement projects in, the marginal cost of establishing a project there, rather than in a developed country where it would be expensive, is marginally lower.

Joint Implementation and CDM gave motivation for states to participate because they were cost effective options, but they exacerbated the sovereign equality of states as developed countries would dominate projects in developing states. The cost effectiveness entails another element of flexibility not yet defined, that of spatial flexibility. States were not restricted to just their territory to achieve the treaty's aims. In some ways this could be viewed in the lens of a collective action problem. Since environmental disasters know no borders, it is appropriate to engage in collective investment regardless of state boundaries.

Above all other flexible mechanisms, CDM was most exploited by developed countries because of its emphasis on projects specifically within developing countries. Whereas, JI was between two developed countries and therefore, two more symmetrical powers (Melkas 2007). The inclusion of CDM, when evaluated in connection to the way state commitments were evaluated—by using net emissions reduced rather than a gross emission reduced—left even more room for exploitation (Rosen 2015, 42). States were able to avoid reducing production at home while paying for reductions elsewhere. Even more overlooked than the exploitation of CDM was the fact that countries could shift domestic production overseas. Since carbon outputs were assigned to the country producing the GHG rather than consuming, outsourcing projects added to the emissions of the country producing the good, not necessarily the country funding or backing it. In practical terms, this means the overall objective of the treaty would be undermined as aggregate global emissions could increase while a state could simultaneously still achieve their individual goal. This can be demonstrated by the UK, which achieved well over its emission reduction goal of 8% less than 1990—achieving 18% less by 2008. However, this calculation overlooks the 20% increase the UK had in consumption-based emissions (Rosen 2015, 42). Due to concerns of overreliance on the flexible mechanisms, some states proposed a “Commitment

period reserve” as a fail-safe to avoid this by capping the amount of emission rights a state can trade (Wirth 2002, 652). This option, and other measures to limit the use of flexible mechanisms were generally favored by the EU and opposed by the Umbrella Group countries who saw it as an economic impediment (Wirth 2002, 652).

Intense debate ensued over the eligibility for, and access to, the mechanisms (Chasek and Downie 2017). One point of contention was over the appropriateness of trading excess emissions for Annex I countries considered as economies in transition. For example, Russia had a large amount of unused emission rights which had been calculated as a result of their negative economic growth since the base year of 1990. However, Russia was still a top contributor to GHG emissions, and some saw these unused rights as not credible (Wirth 2002, 652). Even though there are numerous benefits to flexibility provisions—such as encouraging states to ratify an agreement and detracting from non-compliance because of the multiple options for achieving commitments—too much flexibility detracts from the legitimacy and effectiveness of an agreement.

Even though it is natural to immediately point to the Kyoto Flexible Mechanism when considering flexible provisions as a part of the institutional design of the agreement, there are other important examples. Much like the ozone regime relied on MOPs as the standard meeting structure for the Montreal Protocol, Kyoto instituted regularly convening MOPs in addition to the COPs set in place by the UNFCCC. These meeting were used as a tool to continually readdress the progress of the protocol and success of the framework respectively. This would be an example of transformative flexibility since they allow commitments to be adjusted and shifted

over time. The constancy of the meetings made it an accessible and dependable tool for states of all capabilities, whether Annex I or not.

In addition to the three financial funds created during the Marrakesh Accords, the most recently established financial mechanism was the Green Climate Fund (GCF) created in 2010. The GCF was created as a financial mechanism to the UNFCCC and was also targeted toward helping developing countries make advancements in climate resilience and low emission technology (Betsill and Fiske 2020). These funds were essential in helping create more opportunities for developing countries to achieve climate preparedness and contribute to the global effort to combat climate change. The funds have reached substantial capacities, considering the initial push back it received to mobilize funds, although the quantity is paling in comparison to what would be required to achieve success. One of the largest obstacles to enough funding is a lack of support from enough developed countries, whom see a limit to how much they should be responsible for helping developing states. As of spring 2018, the SPCCF has only received pledges from 15 countries and the LDCF received slightly more, with support from 26 different countries (Betsill and Fiske 2020, 287). Funding deficiencies continue to be a through-line in the climate change regime and was an initial barrier for negotiations for the Paris Agreement. The lack of financial support from a variety of countries indicates that flexibility included to create more equity for states can further create political tensions rather than appease them, especially when a voluntary part of a state's commitment.

Lastly, the most apparent form of flexibility outside of the Kyoto Mechanisms is the inclusion of the withdrawal clause, a type of adaptive flexibility (Kyoto Protocol, Article 27). After three years from the point that Kyoto entered into force, states had the ability to withdraw

from the protocol. Taking it one step further, if a party to the Convention and the Protocol were to withdraw from the convention they would also be considered to have withdrawn from the protocol since membership to the convention is required to join Kyoto.

### *Kyoto Compliance Provisions*

The counterweight to flexibility for institutional design is that of compliance. Kyoto balanced the flexibility with an integrated non-compliance procedure that utilized the Flexible Mechanisms as a punitive measure—withholding the benefit of their use to any country found in non-compliance. The non-compliance procedures, established in article 8 of the Montreal Protocol, inspired the Kyoto Protocol with Kyoto's own non-compliance measures. One element of improved compliance is the inclusion of an effective monitoring system to oversee states' commitments. Kyoto built upon the extensive reporting requirements in the UNFCCC, requiring emission inventory reports and national communications to showcase a varied effort within individual countries. Developed countries were to submit inventory reports annually and national communication every four to five years to be reviewed by an expert panel. The review is conducted by a third party to keep it as objective as possible and the results can include questions the panel has about the countries' plans for implementation (Faure 2020, 145). The purpose of the panel's feedback is to improve the capacity building of states and support them to achieve their individual goals. The Cancun conference in 2010 strengthened the review and reporting system by adding a biennial report on emissions that all parties are required to submit. This further increased the transparency of states' progress towards their commitments (Faure 2020, 145; Andresen and Boasson 2012, 54).

Martimort and Sand-Zantman (2016) argue that Kyoto's compliance features might actually face a credibility problem in that the mechanism was not effective in punishing non-ratifiers to the treaty (Martimort and Sand-Zantman 2016). By not inducing ratification there is a greater possibility of free riding in which states gain the net benefit of other states contributions toward an agreement, without themselves taking any loss or personal cost by contributing to the solution (Martimort and Sand-Zantman 2016, 694). The possibility of free riding suggests that an optional compliance mechanism should take into account the impossibility of punishing non-ratifiers. One non-formal approach to this is political pressure put on non-ratifying states from ratifying countries. Furthermore, the compliance structure took a more adversarial approach in contrast to the Montreal Protocol in that it required states to report *each other*, rather than states reporting *themselves*, as was the case with Montreal. In a sense, Kyoto's compliance reporting creating an almost accusatorial environment which disincentivized countries from reporting one another out of fear of retribution. Another critique to Kyoto is its evenhanded compliance methods. Since, the 38 Annex I countries committed themselves to a certain level of emissions before any system of contributions and corresponding enforcement provisions were established, it can be argued that this made the resulting compliance structure more detrimental for them than non-Annex countries (Martimort and Sand-Zantman 2016, 694).

Young (2011) argues that compliance mechanisms are not the most important aspect to an agreement's success, especially if the regime is not fundamentally regulatory in nature. However, I argue that the climate change regime, although not regulatory in nature, requires effective compliance provisions to ensure adherence to obligations. Without a system established to foster both collective support and deter from non-compliance, I do not believe there will be enough incentive, nor infrastructure, to collectively meet the goals of climate change MEAs.

This is one of the reasons scholars suggest the Kyoto Protocol was weak, because it did not have adequate compliance measures set up for non-Annex 1 countries (Martimort and Sand-Zantman 2016; Sandler 2017).

### *General Design Features of Kyoto*

Another element of institutional design in Kyoto that has been subject to critiques is its time frame. While I have argued that it is beneficial to allow for continually ratcheting up commitments over time by states, the Protocol did not establish a clear enough path for this gradual acceleration of commitment. The open-ended promise of future agreements, and the initial five-year commitment, allowed for stagnation and a lack of long-term innovation or problem solving (Rosen 2015, 40). States were incentivized by the shorter time frame to meet their commitment through quicker fixes; which often meant a reliance on flexible mechanisms rather than changing the way their states fundamentally interacted with the environment and energy production. Furthermore, because the initial commitments were not progressive, but a flat percentage reduction within a small window averaging between 1-8 percent below 1990 levels, states had little encouragement to continue ratcheting up efforts past this point.

### **Conclusion**

The Kyoto Protocol was the first agreement in the climate change regime to mobilize collective efforts and set binding targets for GHG reductions to mitigate the effects of climate change. In this regard, it should be recognized for the milestone it achieved. However, when evaluating the success of the agreement, the results are rather dismal. Not only did the construction of the agreement fail to meet the urgency of the moment by setting lax flexibility

provisions without effective compliance mechanisms, but international conflict stopped the agreement short of achieving ambitious enough binding commitments. Lastly, while some might point out that many states reached their individual targets, this should not be confused with lack of success, but rather ineffectiveness. As some studies show, even if the agreement reached its commitments in full, the effects would be meager with reductions to projected warming only being mitigated by 0.03 °C over the next 100 years (Sunstein 2007, 33). This reveals one of the main flaws was of Kyoto; a lack of secured support with ambitious enough commitments from top emitting states and a lack of incorporation of developing states to eventually join with strong commitments of their own. The results of Kyoto and the climate change regime show that as a global community we still have yet to find an agreement successful enough to avoid the worst damages of climate change.

Kyoto revealed deep divisions between top stakeholders and blocs that must be resolved in order to gain the support from top emitters such as China and the US. While CBDR was used as a lens to structure commitments in Kyoto through the Annex system and Flexible Mechanisms, neither were executed in a way that truly integrated developing countries into the fold. Unfortunately, these two structures became flaws and points of tension for the agreement. The Annex system, and uneven expectation of commitments between Annex and non-Annex states, caused key players to not ratify the agreement. The Flexible Mechanisms on the other hand were mainly exploited by wealthy countries and slowed progress from being achieved in developed countries' own territory. The institutional design has been revealed to be a weak point for the protocol and one of the main reasons it failed (Rosen 2015, 32). However, I do not think these flaws call for scrapping all elements of the design for future agreements but, rather,

demands for a closer assessment of how we implement the design features in a more balanced manner.

## **Chapter 5 ~ Comparing Montreal and Kyoto: Data Visualization of Relevant Emissions and Comparative Study of Institutional Design**

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### **Introduction**

As has been established, the Kyoto Protocol was based on the blueprints of the Montreal Protocol (Sandler 2016). Moreover, the ozone regime has been received by the world as an unparalleled success, both in terms of its negotiations and the outcome. The climate change regime, on the other hand, is still developing MEAs in hopes of being successful enough to combat the ever-growing threat of climate change. Unfortunately, Kyoto has proven to not be the model we need for international climate cooperation.

Even if Kyoto worked exactly as intended, and none of its Flexible Mechanisms were exploited by developed countries, global emissions would still not have been reduced enough to stop the earth's already rising temperatures at a livable level (Rosen 2015, 35; Sunstein 2007, 56). However, Kyoto wasn't able to achieve its aims and importantly failed to secure ratification from the US, marking it as both ineffective and unsuccessful.

Although this paper has looked in depth at the respective regimes and their central protocols—including their general objectives, institutional design features, and some of the pivotal negotiations and international relations which directed such debate—this chapter seeks to close the gap and make direct comparisons between the two. Additionally, this chapter will use emissions data from the key states and negotiation blocs of the regimes respectively to further

assessment the outcome of the agreements. Data could have been used to characterize a number of relevant environmental indicators, but in an attempt to make a more clear comparison I have focused on two data sets related to state usage of ODS and GHGs—the two emission groups most consequential to the ozone and climate change regimes.

This chapter will proceed by first characterizing some of the general differences between the two regimes, looking at member states and the institutional design features of each protocol. The chapter will conclude by looking at the outcome of the regimes using graphs of key state emissions over time and highlighting specific pivotal years for the regime on the graph with vertical lines. This section will conclude by wrapping up and comparing the overall outcome of each protocol and the ways in which the two treaties diverged leading to such different results.

## **Comparison of Protocols**

### *Members and commitments*

The most apparent difference between the Montreal Protocol and the Kyoto Protocol is the lack of support from the US in Kyoto. While it may seem Eurocentric to focus on this, the fact of the matter is that US support is crucial for both the ozone and climate change regime to be successful (Rosen 2015, 31; Von Stein 2008). Not only is the US one of the top three emitters of GHGs globally, and similarly was a top producer of ODSs, but it also carries significant clout in the International Arena, enough that it could be pivotal in negotiations to crafting effective agreements and gaining support from other states. (Rosen 2015, 39; Sunstein 2007, 3; Wirth 2002, 656). Additionally, the breadth of climate change is so large as to require participation from virtually every country, making a large coalition of active participants practically a

prerequisite. On the other hand, ODS were produced and consumed by a relatively small number of countries making smaller coalitions a more accessible option (Sandler 2016, 354).

The scope of the ozone issue seemed to require less states to participate in an agreement in order to solve the issue. However, the Vienna Convention and corresponding Montreal Protocol went well beyond this required threshold and achieved universal ratification; an achievement laudable in its own right and even more so for an agreement with imposed binding obligations on *all* member states.

The division between the north and south was less evident during the Montreal Protocol, and especially during initial negotiations, as developing countries were not large users of ODS. Developing countries did have a perceived higher cap of future potential use of ODS and were granted a 10-year grace period for the phase-out dates of ODS, yet ODS have never had the same association with national growth or date development as GHG. The different relationship between ODS and GHG with state development generates a lower level of perceived unfairness when asking developing states to limit the use the chemicals and an easier pathway to create more equity with something as easily implemented as a 10-year grace period (Najam 2020). On the otherhand, the climate change regime faces a much larger veto collation from the Global South, which makes balancing implementing CBDR in a way that is also acceptable to the north more difficult to juggle. (Longden and Mattei 2014, 27; Sandler 2016; Chasek and Downie 2017; Najam 2020)

In order to recognize CBDR, and create more variation in states' responsibilities, Kyoto chose to develop an annex system. Although it set individualized targets for each country, it was only binding on a select number of developed countries included in Annex B. Furthermore, the

commitment only came in one form, “absolute targets and timetables, tied to historical emissions” (Bodansky 2007, 65). The regime could have benefited from a wider range of approaches, such as initial targets that could be added to and increased over time, similar to the indexed targets Montreal included, or induce some tax system or efficiency standards.

Although the exemption from binding targets on non-annex states was instrumental in attaining high participation from developing countries, the exemption is worrisome as total GHG emissions from the BRICS contributes a huge portion of today’s total emissions. “In fact, China now has a larger carbon footprint than the USA” (Sandler 2016, 353-354). Furthermore, Political tension was exacerbated by this stark divide in responsibility between Annex and non-Annex countries and was a point of contention between the leading countries of both the north and south. It was revealed by the Bush administration that this was the main reason for the US refusing to ratify the protocol (Sunstein 2007, 28). Montreal on the other hand, was able to address differences between developing and developed states in a more even keeled way, which eased political division. By imposing binding commitment on all member states, Montreal was able to guarantee participation from all ratifiers. From this starting point it was easier for the Protocol to make exceptions and distinctions between the north and south with the 10-year grace period gives to developing countries.

It should be noted that one difference, which is irrelevant to the design of the treaties and their respective regimes, is the economics and science surrounding the environmental issues they concerned. For the ozone regime, the market conditions made switching to an alternative to CFCs—one of the central ODS—a worthwhile and relatively easy switch (DeSombre 2001). Not only were the production and consumption of CFCs largely isolated to only a dozen or so

countries, but there were already affordable alternatives being developed at the time of early negotiations (Faure 2020, 137). Such isolated production and consumption has not been the case for the climate change regime. Unlike ODS, GHG are not just used, but heavily relied on for the functioning of nearly every single country on the planet. Even though there is a growing list of more sustainable alternatives to fossil fuels and investment in renewables has expanded at much more rapid pace over the last decade or so, our deeply rooted global reliance on GHG makes economic detachment much more complicated (Sandler 2016; Chasek and Downie 2017; Sunstein 2017). The intricately linked relationship between GHG emissions and our global operations creates not only a much high tradeoff cost for transitioning economies and industries, but also creates an added element of external pressure on government from energy lobbyists.

Additionally, at the time of the agreement's formation the science behind the ozone depletion had much stronger confirmation from the scientific community compared to the science on anthropogenic climate change. It is true that the European Community, voiced concerns over the certainty of the science during initial ozone debates, but they quickly agreed to the reality. Furthermore, "by the time that the Montreal Protocol was introduced, the scientists who advanced the theory behind the CFC explanation for ozone depletion had already been awarded the Nobel Prize in Chemistry for their work (refer to Molina & Rowland (1974) for the paper)" (Longden and Mattei 2014, 24-25). Anthropogenic caused climate change is still a debated topic for some and was most certainly questioned at the time of the UNFCCC. Even though most people, and certainly all credible scientists, do not deny the facts at hand, the small amount of uncertainty gives room for many states to claim that the evidence is too weak to justify international action; it continues to be a point of continuous debates to this day.

Nonetheless, the precautionary cause should supersede any remaining scientific uncertainty, as waiting would be detrimental to our planet and ourselves.

### *Institutional Design*

It is undeniable that the mathematics of climate change make it a much costlier and more complicated issue to tackle than ozone depletion, however the economic differences was not cause of such different results. The climate change regime had, and still does have, the potential to create a well structure institutional design with balanced flexibility and compliance provisions.

One of the largest impediments to Kyoto and the climate change regimes' growth was that it lacked the continual mandated cutback commitment that Montreal achieved (Sandler 2016). Montreal was able to create a positive feedback with each new commitment period securing another step towards reducing ozone depletion, where as Kyoto required renegotiation at every step. The initial negotiations were difficult enough, and lost the support from key players, which made renegotiation even more perilous a prospect. While Montreal has been adjusted and amended several times since it first entered into force, Kyoto's second commitment period has only just this past year reached the threshold to enter into force. Even though Kyoto used annual MOPs just like the MOPs of Montreal, there were a few key differences. Firstly, for the ozone regime, there was one track with parties to both the Vienna Convention and Montreal Protocol attending the MOPs. For the climate change regime two tracks developed, one working the UNFCCC and its member states, and another within Kyoto and its member states. There was a lot of overlap between the membership of Kyoto and the UNFCCC, however the two sets of dialogues created discontinuity and notably had the US party to one and not the other, respectively (Chasek and Downie 2017, 164-175). Moreover, the adjustments provisions added

at the MOP for Montreal became immediately binding on all member states to the protocol (Article 2, Section 9 of the Montreal Protocol). The centrality of having one chain of negotiation for the ozone regime, and the immediacy of adding new provisions without renegotiations, provided valuable simplicity to the regime which climate change was lacking (Downie 2020, 107; Chasek and Downie 2017). The different approaches support the design that future treaties should first aim to secure high participation with easily integrated additional cutbacks rather than cap aggregate greenhouse gas emissions.

Montreal was able to stack and layer adjustments and amendments to strengthen the overall regime through its MOP structure. Whereas the climate change regime had more trouble connecting and building upon existing agreements through MOPs. Because some pivotal states did not ratify the Kyoto Protocol, new commitments in Kyoto did not impose new commitments on all member states to the UNFCCC (Espelage, Hoch, Micelowa, and Weber 2019, 600). In addition, further fragmentation occurred in the Kyoto Protocol since certain facets of the agreement—like the Flexible Mechanisms and the Clean Developments—did not apply to all countries. “As a result, negotiations are taking place in separate tracks for the UNFCCC and the KP” (Espelage, Hoch, Micelowa, and Weber 2019, 600).

Another element of the climate change regime which has proven to be much more fragmented, and by virtue less effective than the ozone regime, is financial support. For the ozone regime, the policy instrument is simplified to basically one device: the Multilateral Fund for the Implementation of the Montreal Protocol (Article 5, Montreal Protocol). The fund has seen enough successful contributions from countries that it has approved expenditure projects totally a few billion dollars (Espelage, Hoch, Michelowa, and Weber 2019, 605). On the other

hand, the climate change regime has a few different funds with slightly different objectives and goals. The main fund, which provides assistance for the Kyoto Protocol and other projects within the climate change regime and UNFCCC, is the Green Climate Fund (GCF) and the Global Environmental Facility (GEF). Three other subsidiary funds are: the Special Climate Change Fund (SPCCF), Least-Developed-Country Fund (LDCF), and the Adaptation Fund (Wirth 2002). While all of the funds aim to provide financial and technological assistance to member states, with particular attention applied to aiding developing countries, the LDCF specifically targets assistance at the least developed countries. Rather than the central Multilateral Fund for the ozone regime, the climate change regime seems to be a problem of too few eggs in too many baskets, spreading resources thin and rendering them ineffective. All of the funds fall victim to underfunding and deficient support for the developed countries whose backing would be most decisive in alleviating the developing states shortages.

In terms of compliance provisions, Montreal was able to incorporate an effective system which deterred noncompliance from member and non-member states. Effective compliance measures effectively incentivized ratification and also substantially reduced the potential for leakage. Because the Montreal Protocol imposed binding emission targets on all of its parties, rather than just annex states for Kyoto, trade restriction against nonparties could be imposed in a nondiscriminatory manner (Hovi and Skodvin 2008). In comparison, Kyoto and the climate change regime found it difficult to enforce compliance evenly amongst its members and were unable to effectively punish nonmember states adding the leakage concern already inherent to climate change (Sandler 2016). Overall, the record of non-compliance under the Montreal Protocol was much lower than that of Kyoto. However, the low levels of non-compliance cannot be attributed solely to the compliance structure of the agreements and rather, are a result of a

number of converging factors (Savasan 2019). Montreal benefits from supplying states the ability to report when they are unable to comply with their commitments, rather than only states being able to report other states, as is the case with Kyoto. Not only is this problematic for Kyoto, since this severely limits compliance to only annex states, but furthermore results show that states almost never report other states noncompliance. As is the case with the Montreal protocol, there have been no cases to date of states reporting another states noncompliance (Savasan 2019, 141; Goeteyn and Maes 2011, 806). Kyoto also strays from Montreal in its establishment of two separate bodies for compliance: the enforcement and facilitative branch (Faure 2020, 152-153). The two-branch approach has been positively reviewed by some as the key to an effective compliance mechanism (Goeteyn and Maes 2011, 801-802).

Lastly, it is important to compare the flexibility provisions incorporated into each agreement. On its surface the most stark contrast between the two treaties is that the Kyoto Protocol explicitly has Flexible Mechanisms built into it, whereas for Montreal flexibility is incorporated in more veiled ways. For Montreal, the greatest flexibility is woven in through the MOP, adjustment provisions, and Multilateral Fund—all of which have been explained more in depth above. Upon first glance, the Kyoto Flexible Mechanisms appear to offer incentives for developed states to concurrently achieve their individual commitments and assist developing states with clean project growth. However, in conjunction with the annex system, the mechanisms were not utilized in an effective manner. Under Montreal, states with different levels of consumption and production are similarly entitled to trade their credits with another country; the difference is that for Montreal this included all member states, not just developed ones (Melkas 2007, 255). In theory the CDM and JI would allow for states to individually meet their goals and collectively achieve the agreement's overall aims; developed countries resorted to

these mechanisms as opposed to reducing emissions in their own states. Furthermore, the flexibility offered to developed states came at the expense of developing states who were left with more expensive options in their home country if they chose to pursue independent projects (Melkas 2007, 276).

## Graphs and Assessment of Outcomes

### *Montreal and ODS*

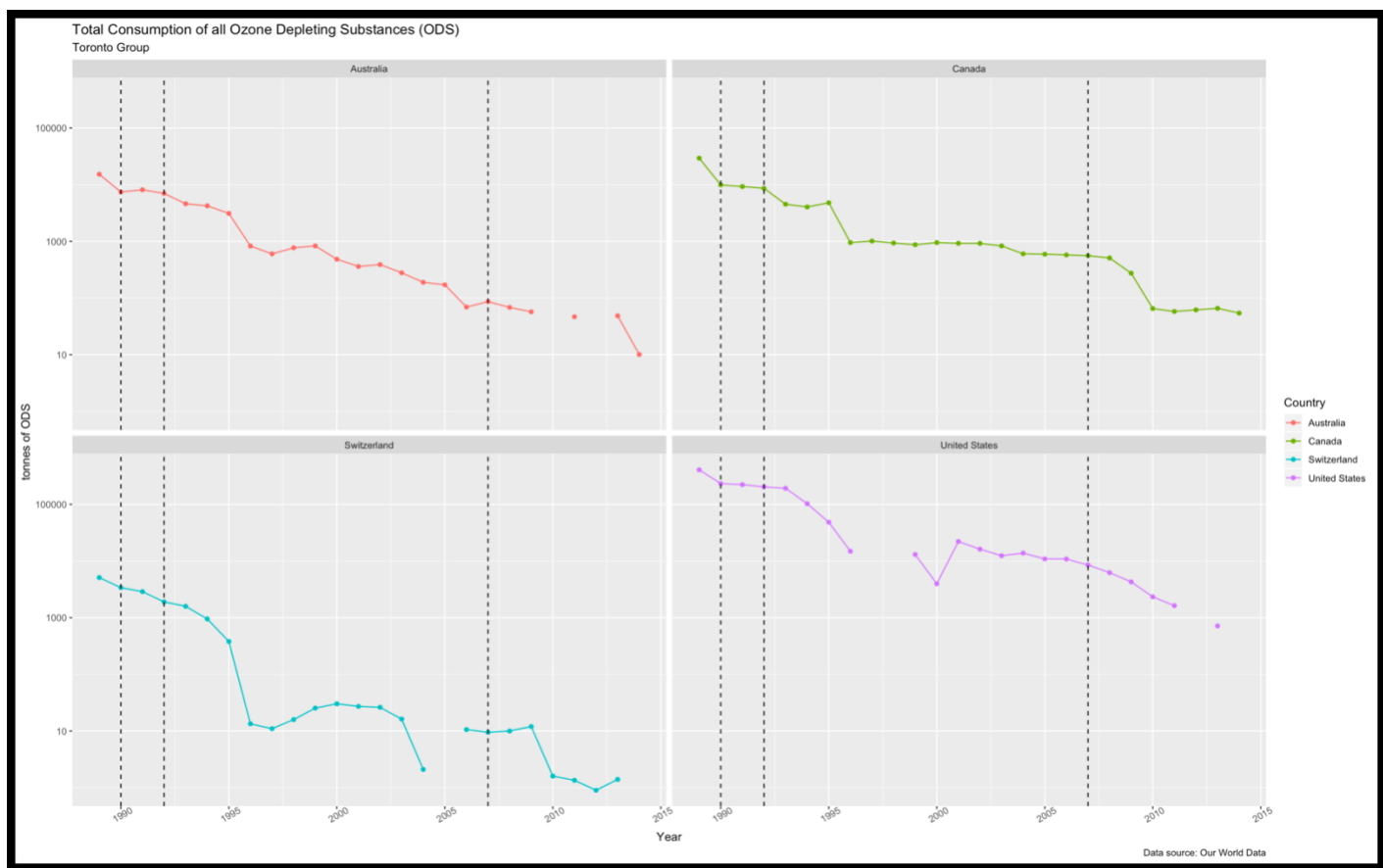


Figure 1

The graph above shows the total per capita consumption of ODS by key members of the Toronto group, one of the original most influential negotiating blocs of the ozone regime. The proceeding graphs for this section represent different negotiating blocs of the ozone regime, however, all of the graphs represent the same per capita consumption of ODS. Similarly, on all three graphs the three vertical dashed lines represent dates of key negotiations for the regime: The Montreal Protocol entering into force (1989), The London Amendment and Adjustment (1990), and the Montreal Adjustment (2007). Any gaps in the horizontal line representing the emissions of the states are from holes in the data and lack of reporting from states in the corresponding year. While all of the graphs show per capita consumption, the values on the y-axis are adjusted accordingly to scale for each negotiating bloc analyzed.

The Toronto group were early proponents of ODS restrictions and pushed for more ambitious phaseout dates of CFCs, as well as inclusion of more chemicals. It is indicated that many of these states had already begun implementing reductions in certain ODS prior to the Vienna Convention. Although there is no comprehensive data on ODC consumption prior to the ozone regime's formation, it is still evident from the years before the first vertical dashed line—the start of the Montreal Protocol—that after negotiations began the member states had begun reduction. As noted above, as well as chapter 3, production and consumption of ODS was limited to only a dozen or so countries. All members of the Toronto Group consumed ODS, but it is visible that some countries consumed more than others. For example, Switzerland's per capita consumption was the lowest of all member states, and after 1995, reduced sharply. All of the countries above show a steady and gradual reduction in consumption, consistent with the phaseout dates of ODS in the Montreal Protocol. Interestingly, after the Montreal Adjustment—the last notable change to the protocol—reductions in consumption stagnated, increased, or

slowed for all of the states. The plateauing could represent a shift in attitude from the Toronto group, which were more concerned about increased restriction against HCFC imposed by the Adjustment (Chasek and Downie 2017).

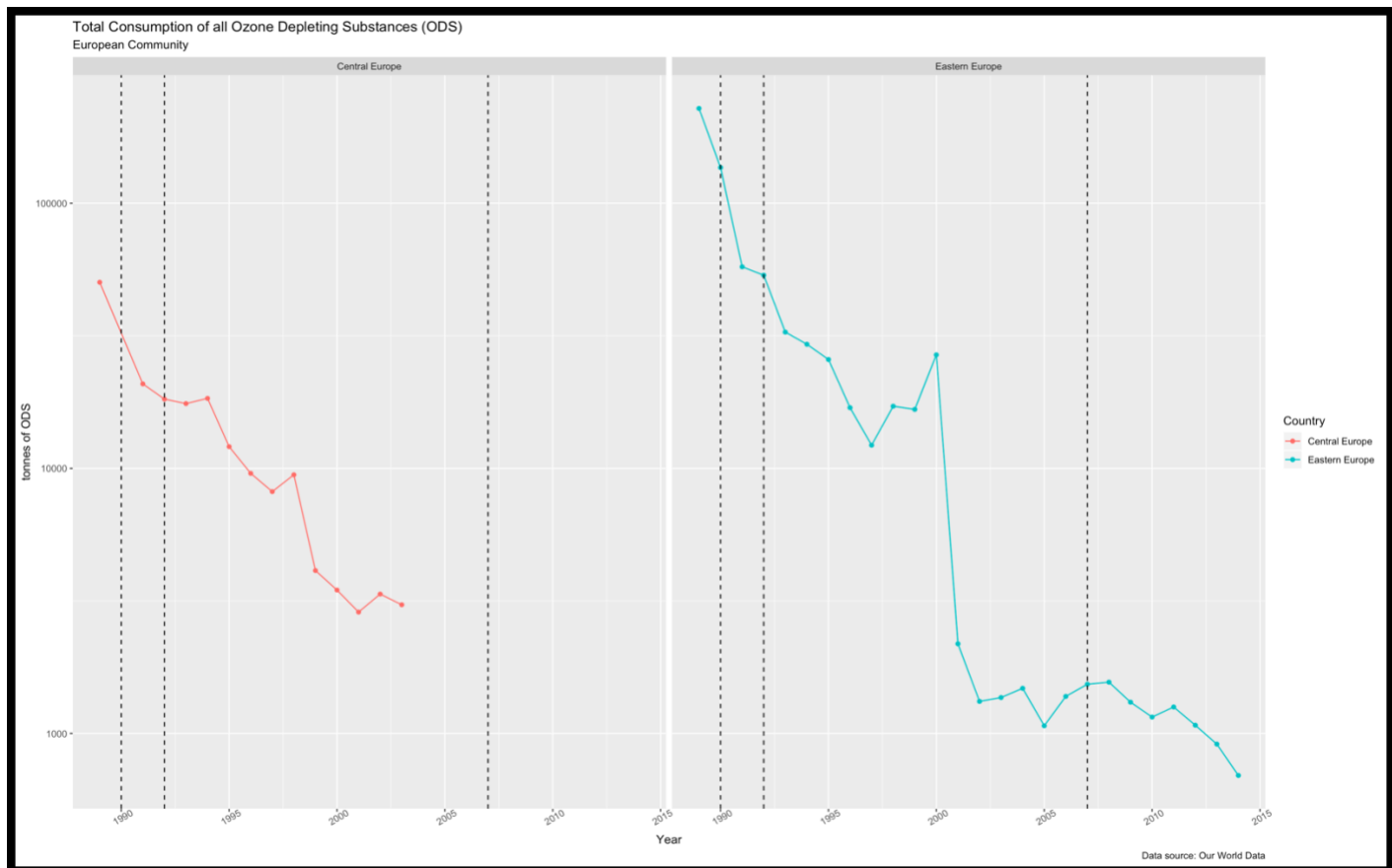


Figure 2

The other main negotiating bloc during early ozone discussions was the European Community. I have included both Central and Eastern Europe since at the time the European Union had not been formally established (Chasek and Downie 2017, 111). In comparison to the members of the Toronto Group, we see a steep decline in production rather than a gradual decrease consistent with the states pictured above. Whilst records were not well kept prior to

Montreal, the first plot mark indicates Europe's relatively high consumption of ODS; especially that of Eastern Europe, which had the highest per capita consumption aside from the US in the base year. This is consistent with Europe's initial hesitancy to commit to steep reductions (Skjærseth 2012). The European Community veto bloc quickly yielded to the Toronto Group after the Montreal Protocol. After the London Amendment the EC drastically reduced their consumption and production. By the time of the Montreal Adjustment in 2007, Europe's consumption showed high reductions, contributing to their willingness to accept steeper commitments since they had already achieved such large reductions (Chasek and Downie 2017, 118).

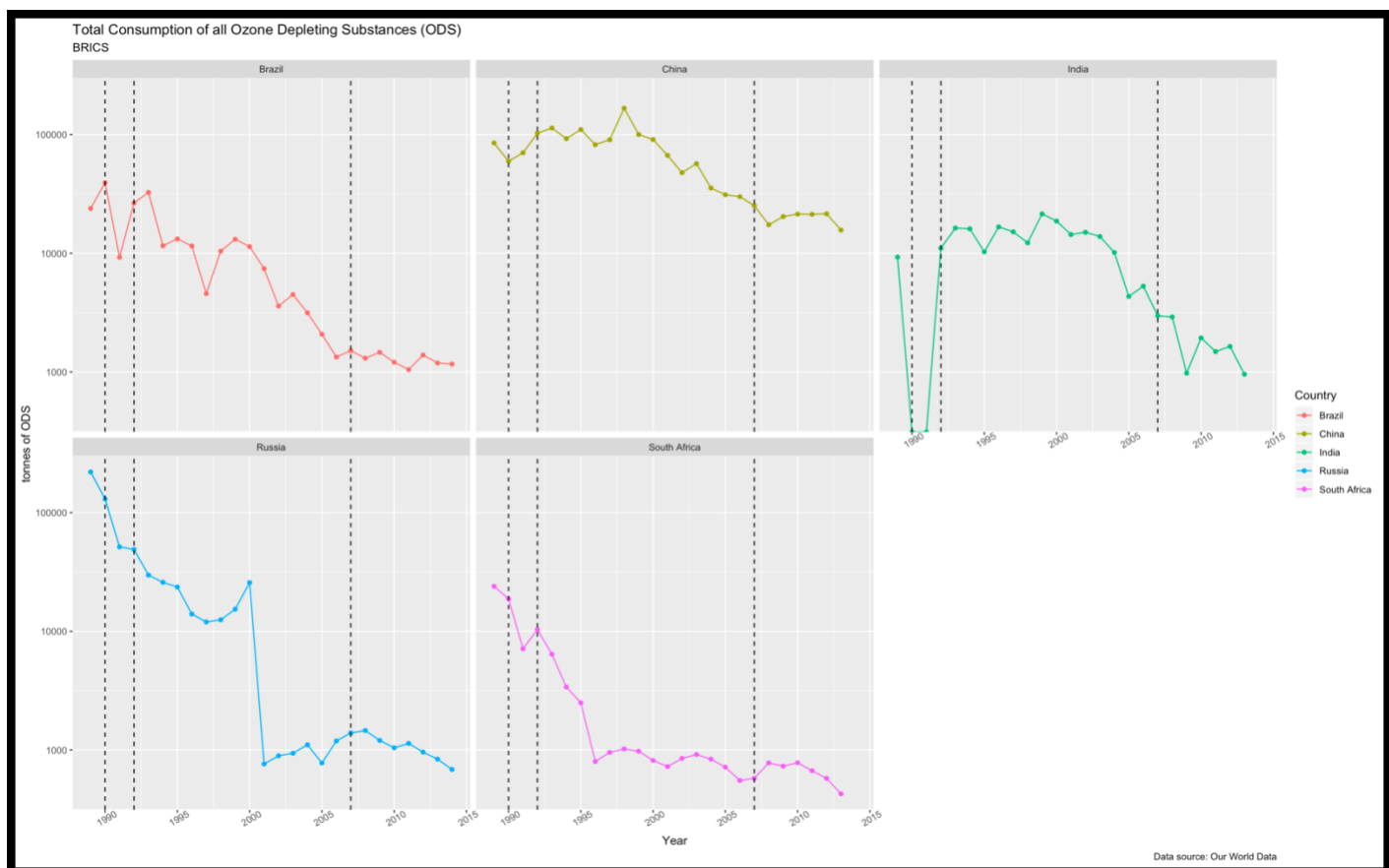


Figure 3

The Global South and emerging economies of the BRICS were a less prominent negotiating bloc for the ozone regime, nonetheless, their concerns were still very relevant and influential. By the time of the Montreal Adjustment in 2007, India and China had gained prominence and sway as world leaders and were especially hesitant to agree to reductions on HCFCs (Chasek and Downie 2017). China appears as an outlier in terms of consumption against all of the BRICS, which mirrors their dominance in the global arena as arguably the most powerful of all developing countries (Najam 2020; Skjærseth 2012). Their decrease in ODS consumption shows the slowest drop in comparison to Brazil, South Africa, and India, which all had more drastic cut offs after the London Amendment in 1990.

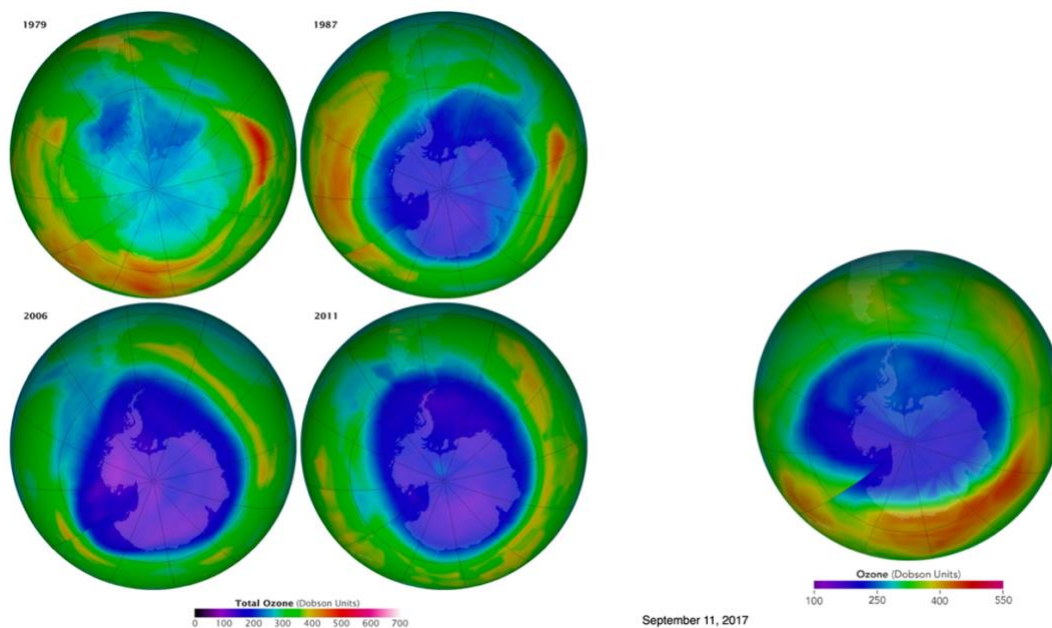


Figure 4 (NASA animation)<sup>32 33</sup>

<sup>32</sup> NASA animation (1979-2011) by Robert Simmon, using imagery from the Ozone Hole Watch.

<sup>33</sup> NASA Earth Observatory images (2017) by Jesse Allen, using visuals provided by the NASA Ozone Watch team.

The images above are projections of the ozone at the south pole provided by NASA. The image deviates from the focus on individual states to show the collective collective results of countries' actions and commitments from the ozone regime. The more purple the center of the graphic by the core, the less amount of ozone present. It should be noted that the 1979 to 2011 projections use a scale of 700 to 0 total ozone, whereas the 2017, and most recent projection, shows 100 units at its lowest extreme. This progression of photos shows the success of the regime in returning the stratospheric ozone concentrations to healthy levels. From 1979 to 1987—right before the ozone regime and initial negotiations started two years after the Vienna Convention—there is a clear and drastic decrease in the ozone levels at the pole. Although there was action taken with the Convention, and later the Protocol, there was a delay in recovery at the poles and the problem worsened. It is not until 2006 that we began seeing positive signs of recovery. The 2017 image shows that the ozone is recovering at a steady and healthy rate and is in line with the scientific reporting that indicates a full recovery near the year 2050 (Downie 2020, 110).

All of the individual state consumptions graphed above are congruent with this progress. Every major negotiating bloc demonstrates a gradual decline in ODS Consumption; even if at times consumption stagnated briefly or bumped back up, the overall trajectory was towards the reduction required to see the increase in ozone levels at the arctic pole shown above. The Montreal Protocol was an instrumental tool for the ozone's recovery , without the structure of the Protocol it is unlikely that we would have been able to successfully confront a seemingly insurmountable environmental crisis.

# Kyoto and CO<sub>2</sub>

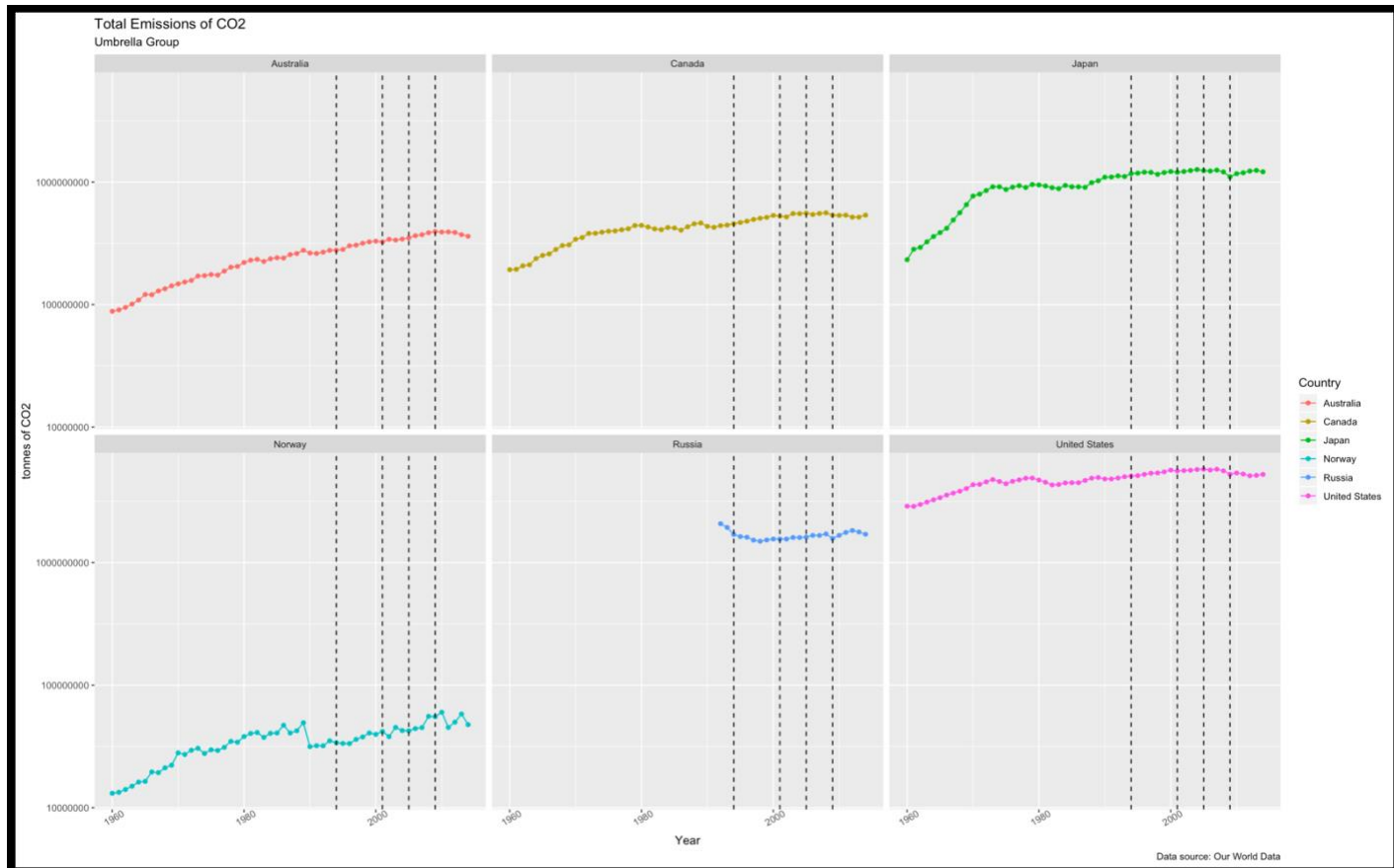


Figure 5

This graph shows the total per capita emissions of CO<sub>2</sub> by key members of the Umbrella Group, one of the original most influential negotiating blocs of the climate change regime. The proceeding graphs for this section represent *different* negotiating blocs of the climate change regime, however, all of the graphs represent the *same* data on per capita emissions of CO<sub>2</sub>. Likewise, on all three graphs the four vertical dashed lines represent dates of key negotiations for the regime: The Rio Conference which lead to the UNFCCC (1992), The Marrakesh Accord (2001), the year the Kyoto Protocol entered into force (2005), and the Copenhagen Accord (2009). Any gaps in the horizontal line representing the emissions of the states are from holes in

the data and lack of reporting from states in the corresponding year. While all of the graphs show per capita consumption, the values on the y-axis are adjusted accordingly to scale for each negotiating bloc analyzed.

Out of the six states pictured in figure 5, only four of them are current members to the Kyoto Protocol and subsequent amendments. The United States never ratified the agreement and Canada later withdrew. However, they are included in the graphic above because they were both vocal members of the Umbrella Group: an informal collection of states all of whom supported less strict commitments and greater flexibility in agreements (Kesternich 2016, 1053; Chasek and Downie 2017, 174). One of the main reasons for their apprehension toward steep commitments was the high cost it would take each to adjust as such high emitters of GHGs. Norway was a part of the Umbrella Group initially, however its interests and emission trajectory followed more on par with the EU. The Umbrella Group coalition was most vocal during the negotiations between Rio and Marrakesh. The Umbrella Group was able to incorporate higher levels of flexibility within the agreement, but they were not able to receive all of the reduced compliance measures they had hoped for, largely due to push back from the EU (Marcoux and Urpelainen 2013, 186). These concessions were not enough to gain the U.S.'s support and the country's emissions show the highest per capita results out of all of the countries above. While the US' overall per capita emissions are much higher than the other states, interestingly the growth and steady increase in emissions tracks with the member states to Kyoto. The parallel between the US and Annex-I countries demonstrates a failure on behalf of the Protocol to cause reduction in emissions from key players more than they would have already been inclined to do. Since the fig. 5 shows emissions produced *within* states, the results of Kyoto might look slightly

different since state commitments are calculated using the Flexible Mechanisms, which includes subtractions from projects in other countries.

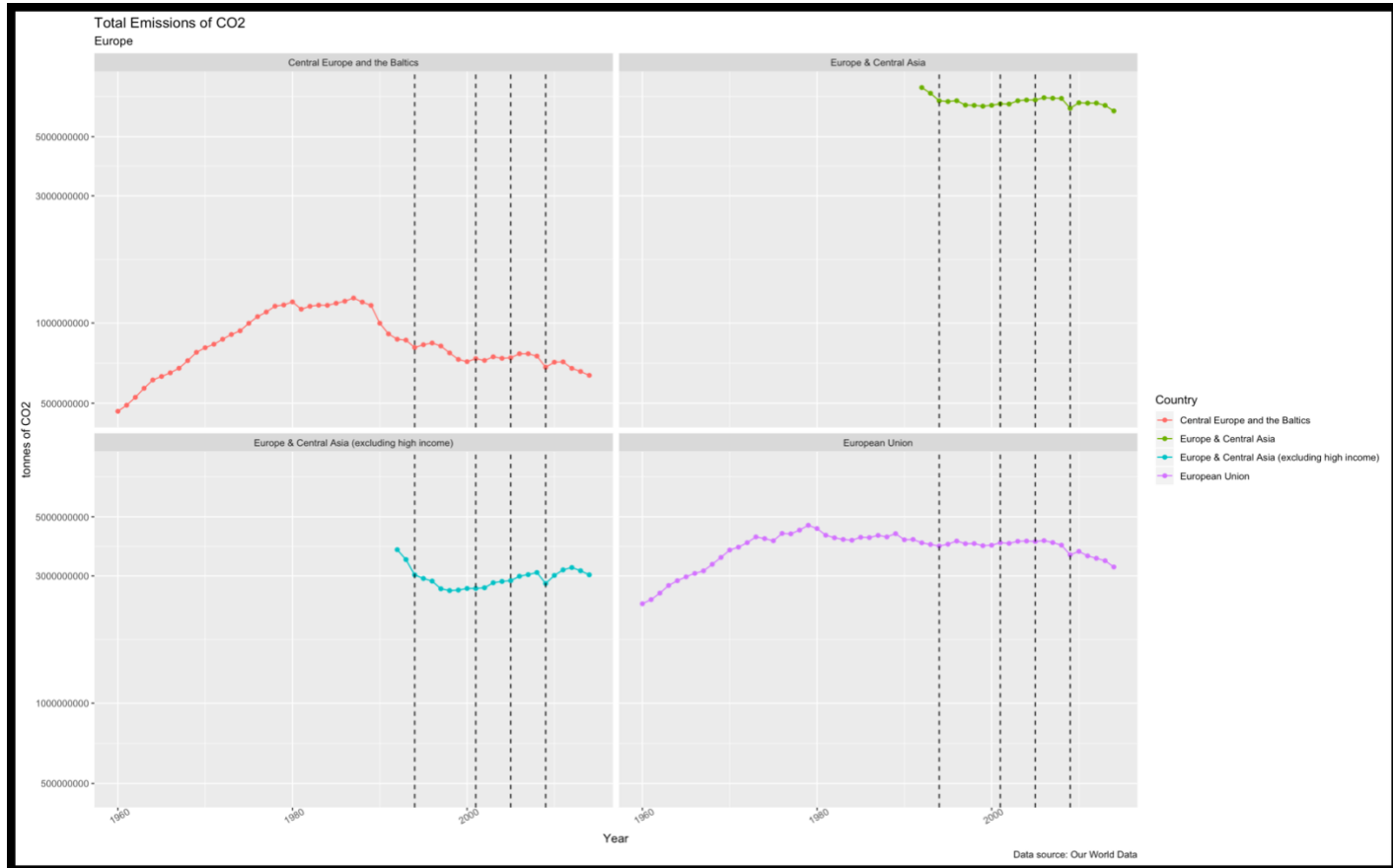
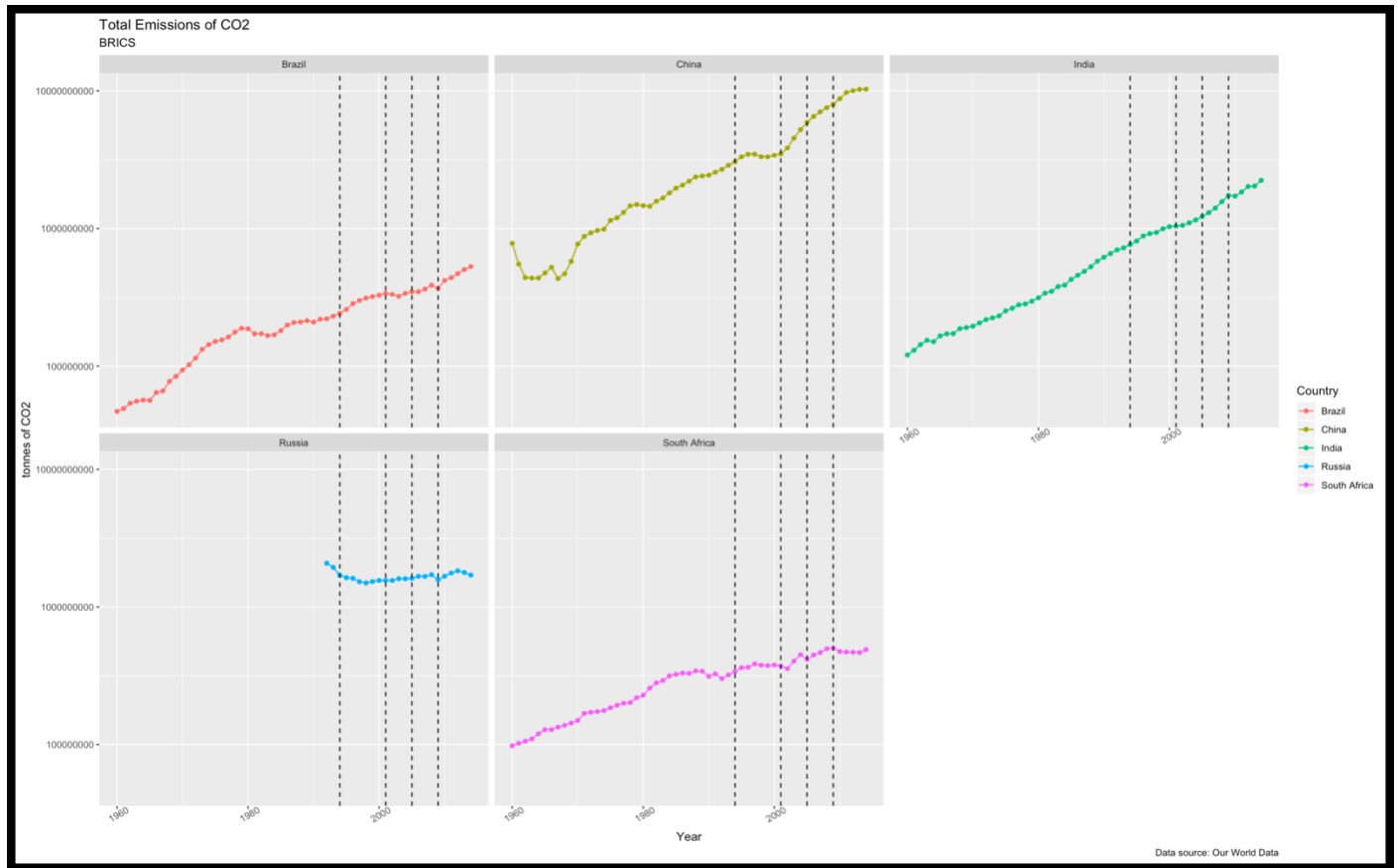


Figure 6 <sup>34</sup>

The EU was the earliest negotiating bloc to push for tighter commitments and urged for less flexibility—worried that it would be a cause for non-compliance (Marcoux and Urpelainen 2013, 186). In comparison to the states in the Umbrella Group, the EU is the only bloc to show a steady decrease in emissions after the formation of the climate change regime and start of Kyoto. The EU's emission reductions demonstrate some level of success and accounts for a large

<sup>34</sup> There are some overlaps in countries represented amongst these regional categories. Furthermore, the main relevant group and corresponding graph to the regime and negotiations is the European Union. There were distortion problems isolating just this graph, so all four remain. They all provide interesting insight, but the most pertinent one I will be discussing is the emissions of the European Union.

reduction in aggregate emissions. After every negotiation highlighted on the map there is, for the most part, a corresponding decrease in emissions. However, the growth in production from other states would render any net emissions the EU helped achieve moot.



*Figure 7*

The countries shown above all represent the BRICS, and in a larger sense the Global South. While many consider the Global South and developing countries to be less consequential participants in GHG reductions, the projections above show otherwise. These countries may have been historically small emitters, but they are all on a path of exponentially rising emissions that in some cases they emit more than some of the developed countries under Annex-I of the Kyoto Protocol. The reality of the BRICS rising emissions gives substance to the US' criticism that

developing countries should also be held accountable for their emissions. If the US had ratified Kyoto they would have had to reduce their own emissions, in effect reducing their industry, whilst China was allowed to grow their emissions considerably between the UNFCCC and 2014 (the last point on the graph available). However, it should be noted that China may appear as an outlier with its rate of emissions outpacing all other developing countries, even those of the BRICS.

China's projections above, coupled with the continuously high emissions from the US, clearly emphasize that while a successful climate change agreement must secure support from negotiating blocs like the South and EU, it most importantly needs to secure meaningful commitment from the two top emitting states. As Depledge and Terhalle (2013) have pointed out, the great-power politics between these two countries is the predominant obstacle for most environmental negotiations. In summary,

We can now see a real obstacle to an international agreement to control greenhouse gases. The United States and China are the largest emitters, and according to prominent projections, they also stand to lose relatively less from climate change. In terms of their own domestic self-interest, these projections weaken the argument for stringent controls. The nations of Africa stand to lose a great deal, but they are trivial greenhouse gas emitters. India is even more vulnerable, and its contribution, while not exactly trivial, is modest. (Sunstein 2007, 53)

Unlike the ozone regime's continual reduction in ODS emissions, the climate change regime shows regression in emission reductions outside of a few countries—none of which are significant enough to sway the results of the regime. None of the significant negotiations highlighted on the graphs above show much tangible results in emission cutbacks. Since there is no mandated cutback period woven in Kyoto, the next climate change MEA should modify itself to show more consistent results in reduction for *all* member states.

## Conclusion

There is bound to be natural differences between agreements of two separate environmental regimes, however the comparison above between Kyoto and Montreal reveal the importance of institutional design and provide some compelling guidance for successful agreement construction. Firstly, both Kyoto and Montreal reveal the utility in having consistent and regularly scheduled convening of member states to discuss agreement progress, either in the form on MOPs or COPs. However, Montreal, and the flexibility it achieved through adjustment provisions secured during MOPs, was vital in securing support and commitment without unnecessary negotiation. Secondly, Montreal proves that securing some level of binding targets across all member states is a successful strategy. Not only does it guarantee actions from all countries, but it also helps avoid the political disapproval from the north that the south is being let off to easily. Furthermore, by including continual mandated cutback commitments rather than requiring discrete commitments with renegotiations, such as with Montreal greater progress can be made (Sandler 2017). Montreal highlights that it is preferable to start in a modest fashion with smaller commitments, but importantly binding commitments, on all member states and make them stricter over time. This supports Young's (2011) view that agreements should be able to change and evolve overtime, and furthermore that IEAs should increase their strictness over time (Young (2016) . Thirdly, a balanced institutional design sets the foundation for a successful agreement. Both treaties could improve on their compliance, especially Kyoto, which failed to balance effective compliance with abused Flexible Mechanisms. It should be noted that Montreal's facilitative compliance and self-reporting was more fruitful than Kyoto's reliance on reporting from other states, which speaks to the importance of facilitation as a tool of non-compliance in addition to enforcement and punitive measures.

From Kyoto we have seen the limitations of a top-down approach to international climate agreements, pointing to the potential usage of a bottom-up approach. This bottom-up approach would give states more flexibility in implementation without jeopardizing the maintaining of deep commitments from *all* members (Kinley 2019, 189). Furthermore, by giving more autonomy to the states themselves, non-compliance would be deterred, and ratification encouraged. The Paris Agreement picked up on this method and accordingly went the route of states each instating their own emission reduction goals or, Nationally Determined Contributions. Paris is more aligned with Montreal in this regard that unlike Kyoto it does not impose any Annex system. If Paris is able to take away the lessons learned from these two regimes and implement it in an effective manner, there is hopes that it can be more successful than its climate change regime predecessors and gain a spot in history as distinguished as Montreal.

## Chapter 6 ~ The Future of the Climate Change Regime with Paris: What we've learned from Montreal and Kyoto

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### Important Dates

| <b>Treaty</b>          | <b>Number of Ratifiers<sup>35</sup></b> | <b>Year Started</b> |
|------------------------|---|---------------------|
| Doha Agreement         | 147                                     | 2012                |
| Paris Agreement        | 191                                     | 2016                |
| First Global Stocktake | NA                                      | 2023                |

### Introduction

It has been 5 years since the Paris Agreement entered into force. As we approach the deadline for the first global stocktake, it is relevant to look to the future of the Paris Agreement and the climate change regime more generally to see how we can maximize the success.

A good international agreement must do three things: attract broad participation from key states and negotiating blocs, deter countries from not complying, and lastly combine the two and achieve countries to both participate and comply with an agreement that has substantiable commitments, enough to be successful at solving the environmental problem at hand. We have seen both extreme levels of success and failures in our analysis of some of the most prominent agreements of the ozone and climate change regime. From the comparison of Montreal and Kyoto we have deduced that a balanced institutional design can lead to greatly attribute to an agreement's success. As Young (2011) points out, institutional design may be the largest single factor to contribute to an international environmental regime's outcome. With this in mind, this

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<sup>35</sup> This number includes Palestine and its occupied territories as a member state.

chapter turns attention to how we can apply these findings to the Paris Agreement and what results are likely to occur as things currently stand.

## **COP 21 and Paris**

The 21<sup>st</sup> COP to the UNFCCC ushered in unprecedented levels of global cooperation on climate change as more heads of states and governments convened under one roof than at any other time in history. While there were a number of disagreements and dissenting states, the outcome of the meeting exceeded most everyone's expectations (Kinley 2019, 189)

Even though there was some dissenting during COP 21, overall there was reportedly a high level of optimism and momentum not achieved at any climate change COP since Kyoto in 1997. There were many achievements at the COP, but most notably: climate change action had shifted from a top-down to a bottom-up approach; the temperature goal of limiting warming below 2 degrees Celsius is enshrined in Paris and nationally recognized as a goal; the inclusion of both a long term goal of climate change mitigation with the tangible temperature goal in tandem; the establishment of the global stocktake; a more nuanced approach to country differentiation and CBDR than just a binary north vs south divide; adaptation and not just mitigation was a focus the agreement (Kinley 2019, 189-190). Even without the first global stocktake occurring, these are remarkable feats that should be viewed as a success in their own right. It is contingent on the results of these stocktakes whether the outcome of the agreement itself will be successful. However, as Bill McKibben has said, "The most compelling thing you can say about Paris is not that it saved the planet, but that it saved the chance of saving the planet" (Kinley 2019, 192 qqtd. Hood 2016).

One of the reasons COP 21 was such a success, is that international conflict seemed to simmer and a spirit of compromise took precedent. The compromise was partially a result of the advancements in technology, which make mitigation more feasible, and partially because of the increase in damaging storms and other climate consequences which forced the issue. In other words, the seriousness and urgency of the problem demanded nothing less” (Kinley 2019, 192). Strong leadership from the G77 and China made sure developing countries and their unique concerns were at the center of discussions (Kinley 2019, 192).

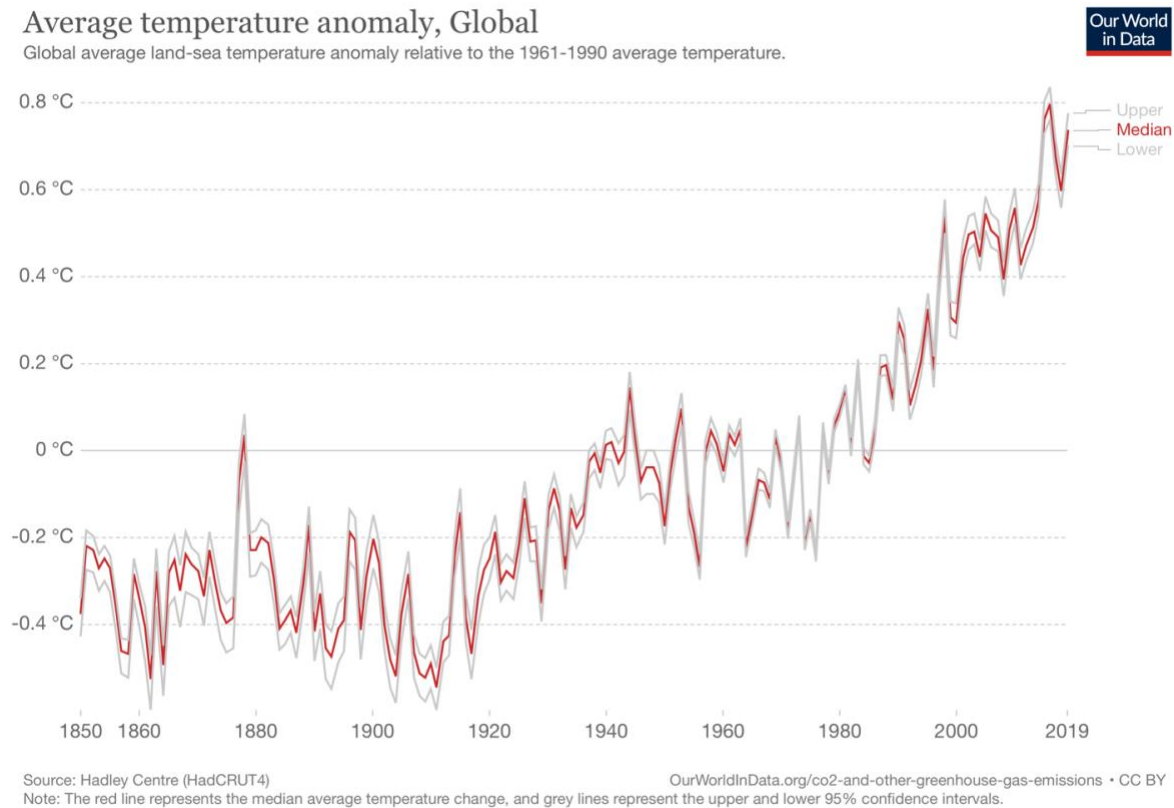
There was also a strong pushback from the US and its allies, namely those of the Umbrella Group from Kyoto negotiations who sought for weaker provisions and goals (Raman 2019, 175). Similar arguments from the US during Kyoto resurfaced, in which they wanted “developed and developing countries to be treated in a like manner legally” (Raman 2019, 176).

Even with all of these ‘achievements’, there still exists plenty of room for criticism. For one, the goal of limiting warming below 2 degrees Celsius seems to contradict the UNFCCC objective of avoiding significant harm to the environment, as even warming to this degree would result in the need of serious adaptation. There have even been talks to lower this temperature standard to 1.5 degrees, yet there exists no set plans for how we can achieve this. Furthermore, with the NDC as currently stands, warming is calculated to exceed this 2-degree threshold (Spash 2019, 197; Raman 2019, 187). Some argue that Paris has further disregarded attempts of avoiding the damage UNFCCC set out to curb with the inclusion of the adaptation measures (Spash 2019, 198). However, I see this inclusion as a necessary one to face the reality of our current situation.

Other criticism of the Paris agreement is its lofty goals with no real plan of execution—such as encouraging adaption without any financial assistance or the promotion of innovation for long term solutions but without the requirement of new technology (Spash 2019, 198). There is not even a mention of specific GHG sources, nor a single mention of fossil fuel use. Similarly, there are no means of enforcement, and as we have learned from Kyoto and Montreal, a compliance system needs some tool to have effective non-compliance measures aside from the necessary facilitative and non-adversarial roles (Spash 2019, 198). I agree with Spash (2019) that the decoupling of economics from energy policy is a weakness of the agreement as it ignores the reality of the financial interest of the industry. Furthermore, the fossil fuel reserves already known represent high economic value, and if tapped into, would lead to warming well in excess of the current goal. Even though a shift to renewable energy promises jobs and growth, there will be a delay in this realized potential as the energy sector transitions away from fossil fuel. However, longevity of our planet and the economic futures of generations to come takes priority from any slowed economic growth in the interim.

COP 21 and Paris provide hope, but Paris' current commitments are not enough. NDC needs to be strengthened immediately as current NDC still have the planet on course to warm closer to 3 degrees Celsius preindustrial. It is now the challenge of moving the words and motivation of COP21 into tangible action and a mobilized effort from the international community (Kinely 2019, 193).

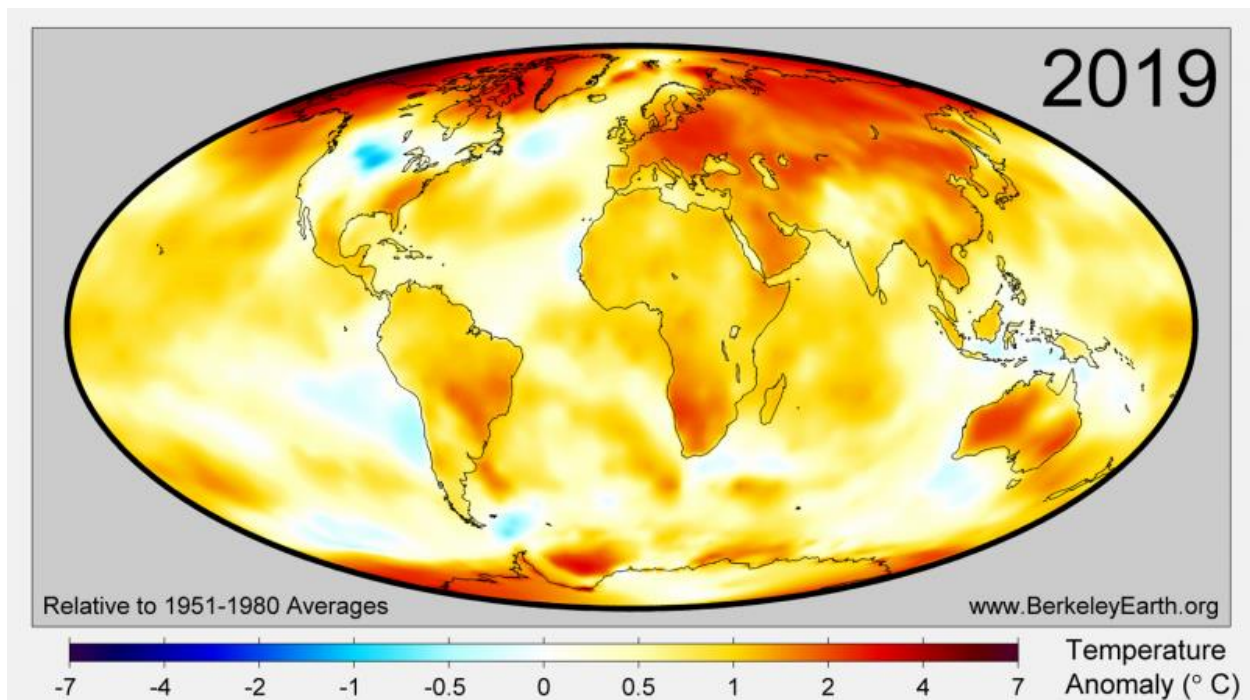
### Global Temperatures Currently



*Figure 8*

As we can see from a variation of the famous hockey stick graph above, global temperatures have been rising at an exponential rate since about the time of the industrial revolution. If we were to graph the total emission of CO<sub>2</sub> in the atmosphere, it would track at a nearly parallel rate to the global temperature increase in fig.1. This parallel demonstrates an indisputable correlation and scientifically backed relationship to our planet's rising temperatures. Global emissions are currently still on an upwards trajectory, but the Paris Agreement has the potential to cause these temperatures plateau if stricter measures are taken. While the temperature of Earth has been rising at a consistent rate, the heating of the globe has not been felt evenly amongst the countries. The heat map in fig. 2 shows that in some regions warming has,

and will continue to be, much greater than in other parts of the globe. Correspondingly, the cost of damage and reduction in productivity as a result of climate change is going to affect different regions and states unevenly. The damage resulting from a 2.5 °C warming for a few key states and regions is listed in the table of fig.3 represented by a percentage loss of GDP.



*Figure 9*

(Berkeley Earth. Global Temperature Report for 2019. Available at: <http://berkeleyearth.org/archive/2019-temperatures/>.)

It is notable that for many developing states in the global south will face a disproportionate amount of the warming and consequences from climate change, even though in most cases they have contributed the least to the problem. This creates a further inequity amongst the states, which I argue supports the fact that CBDR should place the majority of the responsibility on the north. That is not to say that the south should not contribute, I believe that

they are a crucial piece of the puzzle and should have binding commitments just as the north, however, their efforts should be proportional to their situation.

#### Damage Resulting From a 2.5 °C Warming as a Percentage of GDP

| Country          | Percent Loss of GDP |
|------------------|---------------------|
| India            | 4.93                |
| Africa           | 3.91                |
| OECD Europe      | 2.83                |
| High Income OPEC | 1.95                |
| Eastern Europe   | 0.71                |
| Japan            | 0.50                |
| United States    | 0.45                |
| China            | 0.22                |
| Russia           | -0.65               |

*Figure 10*

(Sunstein 2007, 48)

If these figures do not paint a compelling picture of the dire situation of our planet, I do not know what does. It would only put states at a disadvantage to continue to delay making meaningful commitments. The cost of inaction, as represented by fig. 3, far outweighs the short-term cost of adjusting behavior now.

## Possible Outcomes

## Global greenhouse gas emissions and warming scenarios

Our World  
in Data

- Each pathway comes with uncertainty, marked by the shading from low to high emissions under each scenario.
- Warming refers to the expected global temperature rise by 2100, relative to pre-industrial temperatures.

Annual global greenhouse gas emissions  
in gigatonnes of carbon dioxide-equivalents

150 Gt

100 Gt

50 Gt

Greenhouse gas emissions  
up to the present

0

1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100

**No climate policies**

4.1 – 4.8 °C

→ expected emissions in a baseline scenario  
if countries had not implemented climate  
reduction policies.

**Current policies**

2.8 – 3.2 °C

→ emissions with current climate policies in  
place result in warming of 2.8 to 3.2°C by 2100.

**Pledges & targets**

2.5 – 2.8 °C

→ emissions if all countries delivered on reduction  
pledges result in warming of 2.5 to 2.8°C by 2100.

**2°C pathways****1.5°C pathways**

Data source: Climate Action Tracker (based on national policies and pledges as of December 2019).  
OurWorldinData.org – Research and data to make progress against the world's largest problems.

Licensed under CC-BY by the authors Hannah Ritchie &amp; Max Roser.

Figure 11

Figure 4 shows different projections for our planet's warming. As currently stands with state commitments under Paris we are better positioned than if no agreement were to exist. This is encouragement to show the tangible results state actions can have on our planet, just as it did with the Montreal Protocol and the ozone. However, with the current NCD, the planet is still on track to rise within margins exceeding the Paris agreement's goal of 2 °C, let alone the more ambitious target of 1.5 °C. However, the bottom green line indicates that there is a pathway for limiting warming within this 1.5 °C margin. It is important to be reminded that Paris can be tailored to increase its chances of success and accomplish this goal. The primary way it can

achieve this is by structuring for regular accelerations of state commitments. As Young (2016) has stated:

The Montreal Protocol on ozone-depleting substances (ODSs), often thought of as the gold standard in these terms, has been able to ratchet up commitments both by accelerating phaseout schedules for those chemicals already covered and by adding more chemicals to the list of those covered under the terms of the agreement ... By contrast, few if any countries were prepared to ratchet up their commitments to reducing greenhouse gas emissions under the terms of the Kyoto Protocol at the close of the first commitment period in 2012...This suggests that the trick is to craft arrangements allowing for step-by-step strengthening of initial commitments and to muster the political will needed to make use of these procedures effectively (125-124)

One of the simplest ways that the Paris Agreement can implement this is by granting the authority to the COP/MOP to amend existing provisions without requiring a formal ratification, as was the case with Montreal. As of now, the main mechanism for raising ambitions is the regular review of progress made towards the agreement's goal, or the global stocktake which takes place every five years (Falkner 1114-1115). However, this regular review relies on individual country's ambitions and there is no tool for amendments which could easily apply amplified goals onto other states.

## **Conclusions**

One should not underestimate the power of influential actors, or what we can call key negotiating blocs or veto coalitions. Such states, or blocs, have the ability to either improve compliance and gain support from other states, or to become an entrenched source of opposition effectively preventing a treaty from achieving the strength required to solve an issue. The former and latter can both be exemplified by the United States in the case of Montreal and Kyoto, respectively. America took the lead on initial ozone negotiations and inspired other states to follow suit. Conversely, with Kyoto, by failing to ratify the agreement due to political

disagreement they only intensified growing global emissions. With a new administration in the White House, proving to be more receptive to international climate action there is hope that America can resume its role as a lead initiator. It should also be recognized that in addition to renewed international efforts climate efforts have been surging at a much more regional and even local level as states and cities have worked within their own powers to mitigate the effects of climate change (Kinley 2019, 191).

I am not overly pessimistic about Paris or our climate change future, but rather am grounded in the reality that if we do not accelerate our NDC and make more serious adjustments to Paris by or before the first global stocktake in 2023 we are likely to face a planet in such disrepair that no MEA could cure it. This does not mean that Paris cannot and should not be acknowledged for being a successful achievement in its own right. After decades of ineffective multilateral environmental policy on climate change Paris provides a welcome change, but it has not proven nor is it currently on track to be enough to stop climate disaster. While you cannot simply implant the blueprints of one successful MEA to another, we can incorporate effective institutional design features of Montreal and Kyoto into Paris. There is hope, we still have a chance to create Paris into not just an effective, but a successful agreement.

### Bibliography

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- Abbott, Kenneth z., and Snidal, Duncan. 2000. "Hard and Soft Law in International Governance." *International Organization*, 54 (3), (Aug). 2000: 421–456, doi:10.1162/002081800551280.
- Adamson, Fiona B. and Siriram, Chandra Lekha. 2010. "Perspectives on International Law in International Relations." *International Law for International Relations*. (February): 25-43.
- Allen, Myles R., Cain, Michelle, Ebi, Kristie L., Ellis, Neville, Hoegh-Guldberg, Millar, Richard J., Ove, Payne, Antony J., Rogelj, Joeri, Schleussner, Carl-Friedrich, Séférian, Roland, Seneviratne, Sonia I., Tschakert, Petra, Wartenburger, Richard, and Warren, Rachel F. 2018. "The many possible climates from the Paris Agreement's aim of 1.5 °C warming." *Nature* (London), 558 (7708): 41-49.
- Andresen, Steiner, and Boasson, Elin Lerum. 2012. "International Climate Cooperation: Clear Recommendations, Weak Commitments." *International Environmental Agreements: An Introduction*, edited by Andresen, S., Boasson, E. L., and Hønneland, G.: 49-66. Abingdon, Oxon: Taylor & Francis Group.
- Anghie, Antony. 2010. "Basic Principles of International Law: a Historical Perspective." *International Law for International*. Oxford University Press. (February): 46-68.
- Betsill, Michele M and Fiske, Desirée. 2020. "International Climate Change Policy: Complex Multilevel Governance." *The Global Environment: Institutions, Law, and Policy*. 5<sup>th</sup> ed., edited by Regina Axelrod and Stacy D. VanDeveer. Thousand Oaks, CA: CQ Press.: 271-304.
- Bodansky, Daniel, and Rajamani, Lavanya. 2019. "The Paris Rulebook: balancing International

Prescriptiveness with national Discretion.” *The International and Comparative Law Quarterly*, 68(4) (October): 1023-1040.

Bodansky, Daniel. 2007. “Targets and Timetables: Good Policy But Bad Politics?”

*Architectures For Agreement: Addressing Global Climate Change In The Post-Kyoto*

*World*, Joseph E. Aldy, Robert N. Stavins, eds., Cambridge University Press, , UGA

Legal Studies Research Paper No. 07-014, Available at

SSRN: <https://ssrn.com/abstract=1033550>

Boockmann, B., and Paul Thurner. 2006. “Flexibility provisions in multilateral environmental treaties.” *International Environmental Agreements*, 6(2): 113–135.

doi:<http://dx.doi.org/10.1007/s10784-006-9001-7>.

Cali, Basak. 2010. “International Law and International Relations: Foundations for

Interdisciplinary Study.” *International Law for International*. Oxford University Press.

(February): 4-7.

Chasek, Pamela S., David L. Downie, and Janet Welsh Brown. 2017. *Global*

*Environmental Politics: Dilemmas in World Politics*, 7<sup>th</sup> Ed.. Boulder, CO:

Westview Press.

Clapp, Jennifer and Dauvergne, Peter. 2011. “Peril of Prosperity? Mapping Worldviews of

Global Environmental Change.” *Paths to a Green World: 2. The Political Economy of the Global Environment*, MIT Press.

Depledge, Joanna, and Terhalle, Maximilian. 2013. “Great-power politics, order transition, and climate governance: insights from international relations theory.” *Climate Policy: The*

*changing geopolitics of climate change*, 13 (5), (September): 572-588

Downie, David Leonard. 2020. “International Environmental Regimes and the Success of Global

- Ozone Policy.” *The Global Environment: Institutions, Law, and Policy*. 5<sup>th</sup> ed., edited by Regina Axelrod and Stacy D. VanDeveer. Thousand Oaks, CA: CQ Press. : 101-132.
- Duit, Andreas; Linnér, Björn-Ola; Nilsson, Jens; Jernnäs, Maria. 2019. “Cross-national patterns of governance mechanisms in nationally determined contributions (NDCs) under the Paris Agreement.” *Climate policy*, 19 (10): 1239-1249.
- Falkner, Roberts. 2016. “The Paris Agreement and the New Logic of International Climate Politics.” *International affairs (London)*, 92( 5), (September): 1107–1125. DOI 10.1111/1468-2346.12708
- Faure, Michael G. 2020. “Compliance with Global Environmental Policy.” *The Global Environment: Institutions, Law, and Policy*. 5<sup>th</sup> ed., edited by Regina Axelrod and Stacy D. VanDeveer. Thousand Oaks, CA: CQ Press. : 133-160.
- Franck, Thomas. 1988. “Legitimacy in the International System.” *The American Journal of International Law*, 82 (4), (October): 705-759.
- Gareau, B.J. 2010. “A Critical Review of the Successful CFC Phase-out Versus the Delayed Methyl Bromide Phase-out in the Montreal Protocol.” *International Environmental Agreements*, 10: 209-231. <https://doi.org/10.1007/s10784-010-9120-z>
- Goeteyn, Nils, and Maes, Frank. 2011. “Compliance Mechanisms in Multilateral Environmental Agreements: An Effective Way to Improve Compliance?” *Chinese Journal of International Law*. Oxford Univesity Press. (November): 791-826.  
doi:10.1093/chinesejil/jmr042.
- Gosnell, Greer and Tavoni, Alessandro. 2017. “A bargaining experiment on heterogeneity and side deals in climate negotiations,” *Climatic Change* (2017) 142:575-586.
- Henkin. 1979. “How Nations Behave.” *The Reality of International Law*. International Law as

Law, 2<sup>nd</sup> Ed.: 21-22.

Hoch, Stephan, Michaelowa, Axel, Espelage, Aglaja and Weber, Anne-Kathrin . 2019.

“Governing Complexity: How Can the Interplay of Multilateral Environmental Agreements Be Harnessed for Effective International Market-Based Climate Policy Instruments?” *International Environmental Agreements : Politics, Law and Economics*, 19(6):595–613. doi: 10.1007/s10784-019-09455-6.

Hovi, J., & Skodvin, T. 2008.” Which Way to U.S. Climate Cooperation? Issue Linkage versus a U.S.-Based Agreement”. *The Review of Policy Research*, 25(2): 129–148.

<https://doi.org/10.1111/j.1541-1338.2007.00315.x>

Kesternich, Martin. 2016. “Minimum participation rules in international environmental agreements: empirical evidence from a survey among delegates in international climate negotiations.” *Applied economics*, 48, (12): 1047-1065.

Kim, Yoomi, Matsuoka, Shunji, and Tanaka, Katsuya. 2017. “Institutional Mechanisms and the Consequences of International Environmental Agreements.” *Global environmental politics*, 17 (1): 77-98.

Kinley, Richard. 2019. “Climate Change After Paris: From Turning Point to Transformation.” *Green Planet Blues: Critical Perspectives on Global Environmental Politics*, 6<sup>th</sup> Ed., edited by Conca, Ken, and Geoffrey D. Dabelko: 188- 195. Published by Routledge.

Marcoux, Christopher. 2009. “Institutional Flexibility in the Design of Multilateral Environmental Agreements.” *Conflict Management and Peace Science*, 26 (2): 209-228.

Marcoux, Christopher and Johannes Urpelainen. 2013. "Non-Compliance by Design: Moribund Hard Law in International Institutions." *The Review of International Organizations*, 8 (2): 163-191. doi:<http://dx.doi.org/10.1007/s11558-012-9157-6>.

- Martimort, David and Sand-Zantman, Wilfried. 2016. "A Mechanism Design Approach to Climate Change Agreements." *Journal of the European Economic Association*, 14 (3), (June): 669-718.
- Melkas, Eriika. 2007. "Equitable as Equal: The Kyoto Protocol Project Based Flexibility Mechanisms in an Unequal World." *International community law review*, 9 (3): 263-289.
- Najam, Adil. 2020. "The View from the South: Developing Countries in Global Environmental Policies." *The Global Environment: Institutions, Law, and Policy*. 5<sup>th</sup> ed., edited by Regina Axelrod and Stacy D. VanDeveer. Thousand Oaks, CA: CQ Press. : 245-268.
- Ong, David M. 2010. "International Law for Environmental Protection." *International Law for International Relations*, (February): 306- 29.
- Peel, Jacqueline. 2020. "International Law and The Protection of the Global Environment." *The Global Environment: Institutions, Law, and Policy*. 5<sup>th</sup> ed., edited by Regina Axelrod and Stacy D. VanDeveer. Thousand Oaks, CA: CQ Press. : 68-100.
- Raman, Meenakshi. (2019). "The Climate Change Battle in Paris." In *Green Planet Blues: Critical Perspectives on Global Environmental Politics*, 6<sup>th</sup> Ed., edited by Conca, Ken, and Geoffrey D. Dabelko: 175- 2020. Published by Routledge.
- Rosen, Amanda. 2015. "The Wrong Solution at the Right Time: The Failure of the Kyoto Protocol on Climate Change: The Wrong Solution at the Right Time." *Politics & Policy*, 43(1): 30–58. doi: 10.1111/polp.12105.
- Sandler, Todd. 2017. "Environmental cooperation: contrasting international environmental Agreements." *Oxford Economic Papers-New Series*, 69( 2), (April): 345-364.
- Savaşan, Zerrin. 2019. Paris Climate Agreement: A Deal for Better Compliance? Lessons

- Learned from the Compliance Mechanisms of the Kyoto and Montreal Protocols. *The Anthropocene: Politik—Economics—Society—Science*: 11. 17-287.
- Skjærseth, Jon Birger. 2012. “International Ozone Policies: Effective Environmental Cooperations.” *International Environmental Agreements: An Introduction*, edited by Andresen, S., Boasson, E. L., and Hønneland, G., 38-48. Abingdon, Oxon: Taylor & Francis Group.
- Spash, Clive I. 2019. “This Changes Nothing: The Paris Agreement Ignores Reality.” In *Green Planet Blues: Critical Perspectives on Global Environmental Politics*, 6<sup>th</sup> Ed., edited by Conca, Ken, and Geoffrey D. Dabelko: 196- 202. Published by Routledge.
- Stein, Jana von. 2008. “The International Law and Politics of Climate Change: Ratification of the United Nations Framework Convention and the Kyoto Protocol.” *Journal of Conflict Resolution* 52(2), (April): 243-268.
- Sunstein, Cass R. 2007. “Of Montreal and Kyoto: A Tale of Two Protocols.” *Harvard Environmental Law Review*, Vol. 31: 1- 65.
- Voyiakis, Emmanuel. 2010. “International Treaties.” *International Law for International Relations*. (February): 99-121.
- Wirth, D. (2002). “The Sixth Session (Part Two) and Seventh Session of the Conference of the Parties to the Framework Convention on Climate Change.” *The American Journal of International Law*, 96(3): 648-660. doi:10.2307/3062168
- Young, Oran R. 2011. “Effectiveness of international environmental regimes: Existing knowledge, cutting-edge themes, and research strategies.” *Proceedings of the National Academy of Sciences - PNAS*, 108 (50), (July): 19853-19860

Young, Oran R. 2016. “The Paris Agreement: Destined to Succeed or Doomed to Fail?” *Politics and Governance*, 4 (3): 124-132.

### **Treaty Texts and MOP Reports**

Kyoto Protocol to the United Nations Framework Convention on Climate Change (1998).

Montreal Protocol on Substances that Deplete the Ozone Layer (1987).

The Marrakesh Accords & the Marrakesh Declaration

United Nations Framework Convention on Climate Change (UNFCCC) (1992).

Vienna Convention for the Protection of the Ozone Layer (1985).

Report of the 2<sup>nd</sup> Meeting of the Parties to the Montreal Protocol (1990). London, 27–29 June 1990.

Report of the 4<sup>th</sup> Meeting of the Parties to the Montreal Protocol (1992). Copenhagen, 23–25 November 1992.

Report of the 19<sup>th</sup> Meeting of the Parties to the Montreal Protocol (2007). Montreal, 17–21 September 2007.

### **Datasets**

Consumption of All Ozone Depleting Substances:

Our World Data.

[https://ourworldindata.org/grapher/ozone-depleting-substance-consumption?country=~OWID\\_WRL](https://ourworldindata.org/grapher/ozone-depleting-substance-consumption?country=~OWID_WRL)

Total Emissions of CO<sub>2</sub>:

Our World Data.

<https://ourworldindata.org/co2-and-other-greenhouse-gas-emissions>

UNSD Environmental Indicators,

<https://unstats.un.org/unsd/envstats/qindicators>