When Do Aspirational Goals Matter?

Using the History of Global Environmental Governance to Benchmark the Paris Agreement

Hélène Benveniste, Andrew Moravcsik, and Michael Oppenheimer

January 2025

Abstract *The pledge to limit the increase in global mean temperature to 1.5°C has been widely acclaimed as a key achievement of the 2015 Paris Agreement. Many international treaties contain similarly explicit and ambitious "international aspirational goals" (IAGs) with low legal obligation. While an extensive literature claims such goals impact policy in areas like human rights and development, few studies investigate the impact of IAGs contained in international environmental agreements. Starting from an original historical dataset of all international historical environmental agreements (nearly 700), this paper identifies six general causal mechanisms through which such IAGs might alter concrete policies, then uses a nested case study design to estimate their real-world impact. Of the eight regime complexes including 80 treaties with IAGs, we find just two – mitigation of acid rain in Europe and depletion of the ozone layer – where they could possibly have influenced policy change. Even in those exceptional cases, their impact appears to be limited largely to encouraging or marginally enlarging an already highly mobilized coalition of "like-minded" states. These conclusions counsel data-based skepticism regarding the transformative potential of the 1.5°C climate target and other similar treaty-based ideals in international life.*

I. Introduction

Many have lauded the 2015 Paris Agreement on climate change.[1] Most view the Agreement's headline achievement as the promulgation of the long-term objective of holding global temperature increases to "well below 2°C [...] and to pursue efforts to limit [it] to 1.5°C."[2] Diplomats invested much effort and political capital to negotiate this target.[3] The November 2023 climate negotiation in Dubai[4] and the 2023 G20 summit in New Delhi[5] reemphasized commitment to it. Civil society groups, most visibly the youth movement, reference it frequently.[6]

Widespread global attention to this goal is puzzling. The Paris temperature target is not legally binding and the goal of limiting warming to 1.5°C probably infeasible—the temperature already having already risen 1.45°C in 2023.[7] The puzzle deepens once we note that the Paris Agreement is hardly the only international legal agreement to set forth specific and ambitious objectives without creating a corresponding legal obligation or a clear procedural framework for elaboration and enforcement.[8] Such "International Aspirational Goals" (IAGs) play a prominent role in modern global politics. They are found in the 1948 United Nations (UN) Universal Declaration on Human Rights and recently gained new momentum with the promulgation in 2015 of the UN Sustainable Development Goals.[9] A growing consensus of scholars agrees that global governance in many critical areas where formal legal or enforcement is absent – not just some environmental issues, but human rights and development, arms control, migration policy, disease control – rests primarily on governance through informal "goal-setting."

Widespread faith in IAGs raises not just questions about climate change regulation, but basic empirical and theoretical questions about the impact of IAGs more generally. A vibrant scholarly literature has grown up around them, including work proposing conjectures involving interstate coordination, socialization, social construction of values, soft law, goal setting, aspirations, global networks, and epistemic communities. Yet researchers continue to disagree on their impact. Some contend that IAGs are naturally effective instruments of statecraft across the board, because in one way or another "aspiration is inspiring" to all human beings, others remain agnostic.[10] Others counter that "governing through goals is not a panacea"[11] and suspect it has "limited political impact."[12] No matter that their theoretical priors, however, scholars seem to agree that we simply do not know what impact IAGs have: "concrete mechanisms through which global

[1] Dimitrov 2016.
[2] United Nations Framework Convention on Climate Change (UNFCCC) 2015, Schleussner et al. 2016.
[3] Allan et al. 2021. Washington Post, 8 December 2015. For a historical perspective on the climate regime's temperature target, see Oppenheimer and Petsonk 2005.
[4] UNFCCC 2023.
[5] G20 New Delhi Leaders' Declaration.
[6] Eide and Kunelius 2021; Hadden and Prakash 2024.
[7] United Nations Environment Programme (UNEP) 2023; Intergovernmental Panel on Climate Change (IPCC) 2018; State of the Global Climate 2023 2024.
[8] Colgan et al. 2021.
[9] Vijge et al. 2020, p.254.
[10] Finnemore and Jurkovich 2020.
[11] Young 2018.
[12] Biermann et al. 2022

goals function are yet to be examined in detail"[13] and "the jury is still out on whether weak institutional arrangements harm or help with the effectiveness of governance."[14] Even experienced climate negotiators question whether IAGs actually drive action.[15]

This article analyzes the impact of IAGs on interstate environmental policy coordination. It aims to break new scholarly ground in five respects. First, it broadens the study of IAGs to a large universe of over 700 environmental treaties, most unstudied from this perspective, even though their number and potential impact is as great in climate and other environmental areas as any other.[16] To that end, we introduce the first comprehensive database measuring the aspirational content of all existing international environmental agreements, many of which address areas of great potential significance.[17] Second, drawing on studies of international regimes, soft law, and global networks, the article distills six distinct causal mechanisms that could plausibly explain their impact on policy—a more inclusive panel of such theories than has heretofore been employed for empirical testing. Third, it uses high-n quantitative analysis and qualitative process-tracing in a nested case-study design to generate the first empirical estimation of an upper bound on possible influence of IAGs on concrete environmental policy change. Fourth, it estimates the extent to which each of the six theoretical mechanisms could possibly explain variation in observed policy change. In an empirical literature largely devoted to exploratory, exemplary or theory-building case studies focused on single theories, we believe this systematic evaluation of alternative mechanisms whereby IAGs might matter constitutes an advance. Fifth and finally, these findings suggest a data-driven set of conclusions about the potential for the Paris Agreement, and IAGs more generally, to impact policy.

The conclusions are sobering. Among the 73 environmental regime complexes including hundreds of treaties, only two exist where IAGs could have had any significant and autonomous effect on policy coordination. Moreover, any possible effect was limited: IAGs have little apparent effect on recalcitrant governments, but at most only bolster the existing resolve of a pre-existing and self-conscious coalition of the most highly mobilized "like-minded" marginal or governments already in or close such a coalition. Also, even in those exceptional cases, only two of the six causal mechanisms could possibly account for the effect. Beyond bolstering support in already "like-minded" states, effective environmental policy coordination appears to require the use of conventional geopolitical means: domestic policy convergence, new scientific results, and external inducement or coercion. Although we cannot definitively dismiss the possibility that the Paris Agreement standard will be a unique historical case, this is generally grim news for scholars, activists, and policymakers who hope that embedding ideals in treaties, in itself, can promote

[13] Vijge et al. 2020, p.255.
[14] Vijge et al. 2020, p.260.
[15] In a recent interview, US Deputy Special Envoy for Climate Change Sue Biniaz declared "Some people say it's just words, but to me it's like, what do you mean, it's just words? International agreements are just words. It's the reflection of what we think we've agreed to with other countries. And if the words don't matter, then the whole enterprise fails." New York Times, 18 November 2022.
[16] Young 2018; Hale 2024.
[17] Lieberman 2005; Rohlfing 2008.

significant environmental policy change. In a concluding section, we review implications for the Paris targets. The results have similar implications for general theories of global networks, soft law, epistemic learning, transnational civil society, socialization, and other transnational ideational influences.

II. Explaining the Policy Impact of International Aspirational Goals

We set forth a theoretical framework describing the impact of aspirational goals on international environmental protection. First, we propose a specific definition and measures for the independent variable: aspirational targets. Second, we discuss how to measure the dependent variable: policy change. Third, we offer a general theoretical understanding of the influence of IAGs on policy. Fourth, we identify six specific causal mechanisms linking aspirational goals to policy change.

A. What are International Aspirational Goals?

Scholars agree that IAGs constitute a distinct subset among hortatory statements in formal international agreements that take the form of substantive policy goals. Vijge et al. characterize "global goals" as "internationally agreed non-legally binding policy objectives that are time-bound, measurable and aspirational in nature."[18] Oran Young states that ``goal setting normally features the mounting of a campaign designed to attain goals within a specified time frame."[19] Finnemore and Jurkovich define aspirations as collective ``lofty goals" that elicit individual change over time of a transformative nature.[20] Importantly, IAGs differ from conventional regime-based "principles, norms, rules, and decision-making procedures" in not being behavioral prescriptions applicable to individuals (or groups). Rather they are substantive objectives meant to inspire translation into longer-term and more complex behavioral change. They define distant ends around which to create means, not immediate means to achieve ends.

Accordingly, we define IAGs as *long-term policy objectives found in interstate agreements that share three characteristics: specificity, ambition and legal informality. Specificity* means that an IAG takes the form of a precise and sharply defined policy target—such as a 1.5°C increase in global mean temperature. It differs from vaguer ideals, wishes, directions, and symbolic appeals. Absent such specificity, what theoretical reason have we to believe that an IAG would stand out in the flood of international and thereby have a significant impact to any audience—and how we would know empirically if it did?

[18] Vijge et al. 2020, p.255.
[19] Young 2017.
[20] Finnemore and Jurkovich 2020.

Ambition means an IAG is considerably broader and deeper than existing policy. It must be costly and complex to achieve—indeed, manifestly infeasible in the short-term. This distinguishes IAGs from narrower and more immediate technical standards or procedural norms.

Legal informality signifies that an IAG creates no formal legal obligation or immediate institutional enforcement procedure. As much international legal scholarship reminds us, IAGs belong among voluntary "soft law" instruments that aim to encourage policy transformation by setting global agendas.[21] Any aspiration conjoined with an identical legal or procedural obligation is unlikely to impact future state behavior in an autonomous way, since states have already committed to act.[22] Nor could we know if such impact existed, since any subsequent change in behavior would more likely be the result of creating negotiating forums, establishing immediate targets,[23] encouraging domestic legislative incorporation, establishing institutional monitoring, empowering judicial enforcement, or the other conventional behavioral mechanisms through which regimes are said to change state behavior.[24] An IAG sets a substantive goal, but does not specify precise obligatory procedures designed to achieve the goal.[25]

B. What is Policy Change?

To avoid the possibility that states simply respond to IAGs with symbolic or insignificant policy adjustments—or simply use them to justify actions they are already, or would already, take—such policy changes must be concrete, plausibly expected to be consequential, and divergent from prior and expected trends. For the purposes of this study, concrete and consequential environmental policy change is measured along two dimensions. First, did the parties establish indicators and organized processes to measure progress toward the goal? This rests on the presumption that states are unlikely to adopt policies explicitly designed to meet a target they cannot monitor. Second, did the parties implement costly shifts in policy designed to progress toward realizing the aspiration, as compared to plausible counterfactual scenarios? The counterfactual is important: IAGs are likely to be promulgated at times when a policy goal already enjoys considerable support, so we must control for the policy change that would otherwise occur.

Costly and consequential divergence from expected policy is preferable to some more intuitive and widely employed measures of policy impact: whether states and other actors ratify treaties, implement designated policy steps, or make tangible progress toward meeting the IAG—though we report such data in Appendix Table 5, and it is consistent with our findings. As Finnemore and Jurkovich remind us, IAGs differ from behavioral norms in that they do not imply that particular policies, procedures or behavior will be pursued, but are rather to be judged by their

[21] Vijge et al. 2020, p.256.
[22] We acknowledge that technical targets might be especially influential on technocratic elites, whereas they might affect to a lesser degree an aspiration's ability to generate broad public support.
[23] Keohane 1986; Susskind and Ali 2014, ch.6, p.130.
[24] Slaughter 1995; Simmons 2000; Moravcsik 1994.
[25] Abbott, et al 2000 ("Concept of Legalization")

ability to stimulate "intent and effort" in the direction of a distant and uncertain ultimate state, whether or not the goal is actually met.[26] Coding as impactful any situation in which IAGs induce actors to make additional costly efforts to achieve a goal, even if they are thwarted by initial overambition or subsequent delays and unexpected exogenous obstacles, strengthens confidence that we are not underestimating the impact of IAGs.

C. The Influence of IAGs on Policy Change: A General Theoretical Framework

In assessing whether, why and how IAGs have an autonomous impact on policy, we begin by offering a comprehensive set of six theoretical accounts of how and under what conditions they might do so. Such theories are essential. The mere existence of a correlation between an IAG and corresponding policy change, while necessary, is not sufficient to show evidence that an IAG may have had a causal impact, since both may be caused by one or more exogenous factors.[27] To determine whether the correlation is truly causal in a small-n situation, we employ process-tracing to track whether the observable implications match the unique predictions found in particular explanations.

Since IAGs lack legality, coercive power or material resources, all plausible causal mechanisms whereby IAGs impact concrete policy coordination rest on a shared premise, namely that IAGs supply or frame some essential knowledge.[28] Possession of this knowledge is uniquely able to induce state (or social actors) to adopt corresponding policies in ways that opponents cannot block or reverse, thereby inducing global policy coordination.[29] At a high level of generality, all such causal pathways rest on a common five-stage framework or model.

(1) A decisive group of "swing" decision-makers or stakeholders possesses convergent or compatible "latent" interests and/or ideals consistent with concrete, costly and consequential policy coordination.

(2) Some governments or critical social actors remain recalcitrant, not acting on those interests, due to asymmetries of critical strategic, scientific or normative knowledge.

(3) Despite continued opposition to international policy coordination, a sub-group of vanguard states successfully includes an IAG in an international agreement.

[26] Finnemore and Jurkovich 2020.
[27] This may be true simply because governments are independently incentivized both to create an IAG and change policy. More subtly, creating an IAG may be useful (or even necessary) to mobilize broader support for policy change, but can be promulgated by governments at will when a sufficient consensus for change exists.
[28] This essential knowledge may take the form of raw information, descriptive generalization, causal analysis, or a normative claim, and may be true or false.
[29] While goals -- broadly considered -- might not always be created by states, here we have defined IAGs as goals promulgated by explicit interstate agreement.

(4) The IAG redistributes critical strategic, scientific, or normative knowledge that decision-makers in recalcitrant states could or would not obtain elsewhere.

(5) This new knowledge proves decisive, leading the "swing" group of recalcitrants to change their positions more rapidly after the IAG is created and decisively tipping the political balance toward meaningful international policy coordination and widespread implementation of the resulting domestic policies.

D. Causal Mechanisms

In itself, five-stage baseline model is general and ecumenical. Here we present (and subsequently test) six more specific models, which, we submit, cover the primary causal mechanisms that scholars have proposed to explain IAGs, as well as those that follow from widely held general theories of international organization. Together, they comprise a broader range of causal factors than most previous empirical studies have considered.

Such theories fall into two broad categories. Statist theories treat IAGs as means to solve interstate collective action problems by transmitting knowledge from like-minded governments to other governments and leaders. By contrast, two-level theories of institutions treat IAGs as instruments to transmit knowledge from like-minded states to non-state and sub-state actors.

a. Interstate Causal Mechanisms

Interstate theories focus on ways in which IAGs directly impact national governments, seeking to help them overcome collective action problems and coordinate their behavior. In each explanation, the absence of knowledge blocks cooperation; theories diverge over the type of knowledge involved.

i. Strategic Information and Interstate Coordination

Interstate theories of strategic knowledge, notably classic regime theory, presume that international institutions frame, augment, or reshape the knowledge each state possesses about the preferences, capabilities, options, strategies, intentions, and actions of other states. In anarchy, this knowledge is assumed to be incomplete and/or asymmetrically distributed, creating uncertainty, risk, coordination costs, and collective action problems that constrain policy coordination.[30] Yet, If states have latent common interests and very similar interactions are repeated many times, properly designed issue-specific regimes may reshape the distribution of strategic information in ways that reduce the cost of requisite interstate policy coordination.[31] As applied to aspirational goals, the most straightforward conjecture of this type is that collectively approved IAGs establish

[30] Keohane 2005, ch.6, p.92-93.
[31] Krasner 1982.

"focal points" or credibly signal common issue-specific preferences, allowing states to coordinate on a common global agenda for global negotiations.

Yet reasons for skepticism remain. It is unclear that IAGs constitute a costly, and therefore credible, source of information about strategic intent. Extensive literatures on human rights and development suggest that many recalcitrant states do not view IAGs as establishing any type of credible commitment, and thus approve them primarily to deflect criticism or receive foreign aid.[32]

ii. Scientific/Policy Expertise and Interstate Learning

Theories of scientific knowledge presume that the scarcity or asymmetrical distribution of expert scientific or policy knowledge imposes binding constraint on policy coordination.[33] Global policy coordination in complex technical areas often rests on shared expert knowledge about the nature of a policy problem, technological solutions, cost estimates, policy design, and implementation. Without external provision of such knowledge, some states may be unable to grasp or manage the potential benefits of policy coordination, or may lack the capacity to implement common policies. Barnett and Finnemore argue that experts in international organizations monopolize "specialized technical knowledge, training, and experience that is not immediately available to other actors," which gives them and their allies persuasive power.[34] Some scholars argue that epistemic communities' unique possession and control over expert scientific and policy analysis (or the appearance of these things) may allow them to act as "enterprising knowledge brokers,"[35] manipulating states by quietly providing knowledge consistent with their own normative or positive beliefs.[36] While IAGs neither demonstrate nor require the production of state-of-the-art scientific, policy or other technical information: instead, they distill, disseminate and package in an extremely simple cognitive frame that allows for effective "messaging" of technical knowledge produced anywhere. IAGs might appear to be well-suited to the task, because they often emanate from recognized expert panels or bureaucracies, possess an authoritative and credible multinational imprimatur, and bundle existing problem assessments and policy responses into a single easily understood target, such as the 1.5°C climate change goal.

Yet, reasons for skepticism remain. In particular, any monopoly on information diffusion given to an epistemic community is unlikely to endure across the long-term transformative process that IAGs are designed to inspire.

---

[32] Simmons 2009, Moravcsik 2000.
[33] Haas 1989.
[34] Barnett and FInnemore 1999.
[35] Haas and Haas 2002.
[36] Such goals may also be framed so as to trigger cognitive biases, for example by portraying a priority as preventing a catastrophic loss and thereby, according to prospect theory, triggering cognitive loss-avoidance (Weber 2008). For instance, the 1992 UNFCCC aims to ``achieve […] stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system" (UNFCCC 1992).

iii. Normative Knowledge and Interstate Legitimacy

Theories of normative knowledge argue that international institutions induce policy coordination because they frame issues in ways that socialize governments to accept it as legitimate not because of an instrumental calculation, but because they view the transmitter of the knowledge or the knowledge itself as authoritative. Where national leaders view internationally authoritative individuals, groups, rhetoric, or goals as intrinsically legitimate, they can be "socialized" into accepting their normative priorities. This "logic of appropriateness" encourages governments to act in a pro-social manner, even when it conflicts with their underlying interests.[37] IAGs may seem particularly well-suited to convey normative knowledge because, unlike regime procedures or scientific knowledge, they rest on something closely akin to a normative ideal. Finnemore and Jurkovich argue that, by their very nature, aspirations in politics have intrinsic normative weight and can trigger "transformation through imagination" without any clear constraint.[38] In his study of China, Iain Johnston argues that states are socialized into deference to international or cosmopolitan norms if they are espoused by authoritative, legitimate, or higher status foreigners, whether international or national leaders. States comply with such norms to avoid the bad reputation, low status, psychic discomfort, and naming and shaming that might result if they fail to do so.[39]

Here as well doubts arise. Even if states sometimes act out of normative commitment, it remains unclear whether IAGs play a decisive role in sparking such an effort. Busby's empirical study of development and humanitarian policy finds that global aspirations can affect the calculations of top national decision-makers only when the material costs to established interests are low and the IAGs trigger are consistent with established national or individual values or identities.[40]

b. Two-level Causal Mechanisms

Over the past two decades, a growing body of scholarship has criticized the limitations of interstate (or "direct") theories—in part for the reasons above—and proposed two-level (or ``indirect") theories of the effects of international institutions.[41] Two-level theories view IAGs primarily as instruments for transmitting strategic, scientific and normative knowledge produced by international organizations not to states, but to societal (non-state) and sub-state actors, who change their views as a result. Here IAGs overcome collective action problems at the sub-national or social level that prevent the successful expression, aggregation or influence of latent social

[37] Johnston 2001; Young 2017.
[38] ``Proclaiming lofty goals and organizing collective work toward them affirms the identities of actors, both in their own minds and to their larger community. It makes people feel good about themselves. […] connections to values and identity can underscore the loftiness of the goal, motivating people to pursue it" (Finnemore and Jurkovich 2020 pp.759-769).
[39] Johnston 2001.
[40] Yet he finds that cooperation by more self-interested actors is also generally still required (Busby 2007).
[41] Abbott et al. 2015.

support for policy coordination[42]—a process referred to by scholars as "galvanizing"[43], "orchestrating"[44], "catalyzing"[45], or "coordinating"[46] support. Here we distill three causal mechanisms through which transnational, non-state, sub-state actors can influence concrete policy. Specific two-level theories are distinguished not by the specific type of knowledge that is transmitted, but the causal process by which knowledge is used to influence policy.

i. Orchestration: Inducing voluntary compliance by transnational and sub-state actors

International institutions can be viewed as a two-level means to "orchestrate" sub-national or private transnational and domestic actors, who then voluntarily adopt decentralized regulatory standards, policy solutions or behavioral change.[47] Rule-making processes that "bypass" nation-states in this way exist in voluntary international standardization bodies, trans-judicial network that seek informal precedents from other legal systems, private or public-private development funding, decentralized environmental policies of cities, states, private businesses and other sub-national units.[48] The role of an IAG in the process of orchestration might be to set a clear "soft law" standard uniquely able to provide essential knowledge. It may signal the strength of like-minded forces abroad, provide policy and scientific imprimatur, or offer normative legitimation.

Yet clear limits seem to exist to the power of orchestration to change policy. Theoretically, decentralized coordination may work when autonomous but parallel policy implementation can deliver localized benefits. Just as in interstate policy coordination, however, recalcitrant defectors have an incentive to exploit cooperators, undermining incentives to cooperate. Among non-state and sub-state actors, this is even more difficult to monitor, as when multinational firms sign codes of conduct, but use misleading reports, unregulated subcontractors or complex production processes to "greenwash" their behavior.[49] In addition, private compliance is likely to be efficacious only where sub-national, private and non-state actors enjoy considerable autonomy—and thus less so under centralized, authoritarian or dirigiste governments that oppose cooperation.[50]

ii. Mobilization: Influencing recalcitrant countries from within

[42] Hale 2020; Oye 1985; Kelley and Simmons 2015.
[43] Young 2017.
[44] Abbott et al. 2015.
[45] Hale 2020.
[46] Urpelainen 2013.
[47] Abbott et al. 2015.
[48] Abbott, Bernstein, and Janzwood 2020.
[49] Ramus and Montiel 2005.
[50] Hale and Roger 2014. Hale and Roger further differentiate the use of orchestration as a means to overcome initial costs to starting collective action from its use as a means to shape or support existing actions.

A second two-level causal mechanism has non-state actors not acting alone but mobilizing and pressing their governments to change policy. The legal literature on international "soft law" labels this the "managing states" form of international orchestration.[51] International organizations, including the Paris Agreement, are now customarily designed to include private, civil society and political actors outside the executive branch, in part to encourage their domestic engagement. IAGs seem well-suited to assist in this process by publicize and framing strategic, scientific, and especially normative knowledge.[52] The ratification of aspirational norms brings issues to the attention of domestic publics, civil society groups, political elites, social movements, the media, and public opinion.[53] Informed and mobilized individuals may press then impose "audience costs" on governments that fail to implement policies consistent with IAGs.[54]

Many of the reasons for caution discussed above apply also to social mobilization. It is unclear why IAGs are a uniquely decisive source of domestic and transnational knowledge. Furthermore, once an IAG is established, it is likely to function, at least in part, as an effect, not a cause, of knowledge dissemination.

iii. Catalyzation: Bolstering domestic support in like-minded countries

In some cases, IAGs may not directly change policy in recalcitrant countries. Rather, they disseminate strategic, scientific and normative knowledge only among sub-national actors in states where policy change is already furthest advanced. Further strengthening support in "like-minded" countries may seem paradoxical, yet doing so rests on the hardheaded premise that IAGs are more likely to incentivize or inspire clubs of vanguard countries to redouble their commitment to policy change—and this can create positive policy externalities. Moving in a coordinated group can create first-mover advantages—control over new technologies, strictly regulated market access, detailed policy and scientific knowledge, and the moral high ground—with which vanguard states can induce, compel or persuade recalcitrant countries to adopt and implement higher standards.[55] This sets in motion a process of "increasing returns" that spreads high standards elsewhere, thereby "catalyzing" global policy change.

---

[51] Abbott et al. 2015.

[52] In the case of more precise and concrete global standards, Kelley and Simmons conjecture that the purpose of standards may be to ``mobilize domestic forces to keep states accountable,'' though they do not theorize or test this notion further but instead call for more research (Kelley and Simmons 2019).

[53] We can exclude the institutions most often cited in this context as setting domestic agendas: courts. They are rarely involved, because IAGs are not legally binding. Legislatures sometimes consider treaties, but IAGs do not create requirements for domestic implementation. So, the most likely transmission belt is elite or popular opinion.

[54] Fearon 1994. This is not obvious, however, since scholars have struggled to find empirical evidence to support the conjecture that generic ``audience costs'' lock policies in, independent of the true underlying social preferences (Snyder and Borghard 2011). We note that imposing such audience costs is greatly facilitated when the aspirational goal can easily be linked to individual countries' objectives and actions, which is not the case of the Paris Agreement's temperature target. This tracing issue would deserve a whole separate analysis; we do not focus on it here.

[55] Hale 2020.

The final step of inducing recalcitrant countries to change policy takes place not through IAGs, which inspire only the vanguard countries, but by traditional means: tied foreign aid, conditional market access, investor incentives, capacity building, lower prices for new technologies, or even coercion. For instance, establishing a competitive advantage in new industries does not simply bolster domestic support for high standards, but also creates a "California" or "Brussels effect" whereby industries elsewhere are forced to "level up" in order to maintain market access.[56] The EU, for example, included emissions from the aviation sector into its emissions trading scheme in 2012, partly as a way to pressure other countries to enact emissions caps on international aviation—an area left uncovered by the Paris Agreement.[57] Over the longer term, subsidizing the up-front costs of demonstrating the viability of new technologies and policy designs may reduce adoption costs for follower countries—as was arguably the case for German-driven declines in the cost of solar panels.[58]

Yet skepticism remains about the autonomous impact of IAG catalyzation on policy coordination. The most obvious concern is reverse causality: catalyzation depends on considerable prior ideological and material convergence among like-minded states, which creates the preconditions for IAG to be promulgated in the first place—and the specific marginal value of vanguard states incentivizing themselves remains unclear.

III. Testing Causal Theories of Policy Coordination

To assess the causal effects of IAGs, we turn to historical cases for empirical evidence to test the six theories, proceeding in three stages (Fig. 1). First, we code the independent variable by examining the entire universe of 700 environmental treaties, selecting those agreements that contain an IAG and address issues that are not extremely narrow and local in scope (blue shades in Fig.1). Second, we look for correlations, assessing whether policy changed after an IAG was adopted, using it as *prima facie* evidence of a possible IAG effect (teal shades). Third, we use detailed process-tracing (green shades) to assess whether the observable implications of each of the six candidate causal mechanisms were present and assess using counterfactuals any exogenous factors that could induce a spurious correlation.

[56] Bradford 2020
[57] Timperley 2019.
[58] Hale 2020, 2024.

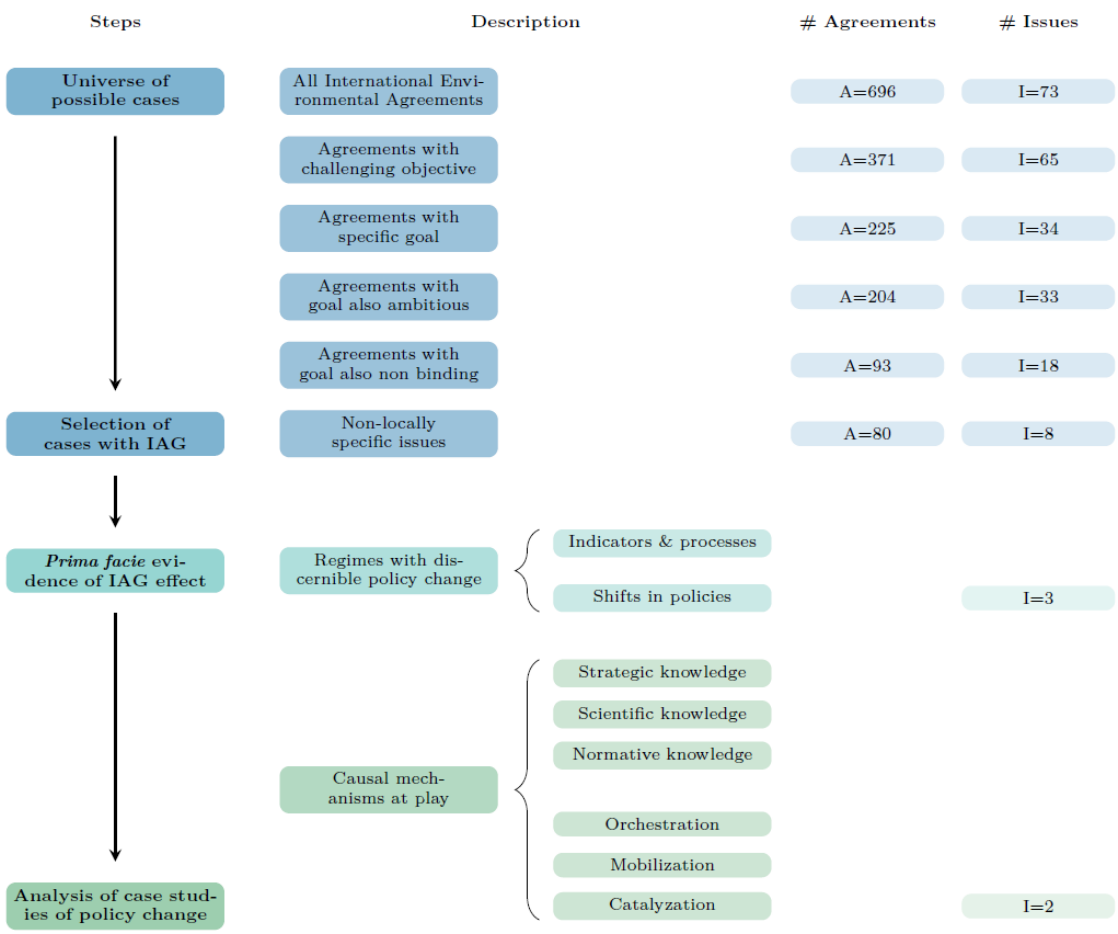

Figure 1 – Structure of the empirical analysis

A. Step One: Identifying IAGs in the Universe of Environmental Regimes

We begin by compiling a dataset of 696 international environmental agreements covering 73 distinct issues, a list we believe to be exhaustive.[59] To that end, we combine two widely used databases of agreements, one by Mitchell[60] and one by Barrett[61], then remove cases that are either not environmental or not international. We then examined the relevant treaty texts to find cases that include a specific, ambitious, and non-legally binding goal, as per our definition of an IAG. This generates our first finding: *IAG are relatively infrequent in the environmental realm.* Of our entire sample of 696 agreements, 371 (32%) contain a challenging objective. Yet, 145 of these are non-specific as to the target and another 22 are unambitious, leaving only 204 agreements (29%

[59] Coding details on all cases can be found in the Appendix (Tables 1-3).
[60] Mitchell 2002-2022. Mitchell et al. 2020.
[61] Barrett 2003, Appendix 6.1.

of all IEA).[62] Of these 204 IEAs, however, 111 are agreements that simultaneously set specific, technical and binding targets to the same end. That leaves only 93 treaties (13%) that relied exclusively on IAGs. These are found in in 18 broad issue-specific "regime complexes"—the unit of analysis we use for measuring policy change through process-tracing of causal mechanisms.[63] Among these 18 regime complexes, we then set aside those that address very small-scale and local environmental issues and move forward with those that resemble climate change in that they address global or regional concerns.[64] We are left with the 8 issues listed in Table 1 with the text of their IAGs.

Before moving forward with these 8 cases, it is worth reflecting on which transboundary environmental problems do *not* seem to generate IAGs. Such cases fall into three categories. Some are so narrow as to not require an IAG; examples include treaties establishing new scientific institutes, which present no challenging objective. Others inspire too weak a level of consensus to produce an IAG: such documents typically contain vague statements, as in biodiversity conservation treaties.[65] Finally, in some cases the consensus was solid enough to generate something stronger than aspirational commitments, for example, legally binding technical targets. For these cases, ranging from nuclear safety agreements to treaties limiting transport of hazardous materials, we conclude that the assumption was that given existing consensus, something stronger than aspirational persuasion was both feasible and necessary to generate policy convergence. Additional support for this claim lies in the fact that treaties including technical binding targets are in general more specific yet less ambitious than the ones not including any.[66]

[62] We use a gradation in four categories for specificity and in three categories for ambition, retaining cases meeting the top two categories on both dimensions.
[63] Keohane and Victor 2011.
[64] We do this both to achieve comparability with the Paris Agreement and to limit the logistics of process tracing to the most important regime complexes.
[65] We do not consider cases where the level of consensus is so low that no agreement at all results from global cooperation. A telling example is the UN Forum on Forests, in charge of addressing deforestation (Dimitrov 2020).
[66] Cases accompanied by binding technical targets feature the highest degree of specificity in 43% of cases but the highest degree of ambition in 21%, while cases without such technical targets -- those we are interested in -- present highest specificity in 17% of cases but highest ambition in 52%.

Table 1 - The eight Environmental Regime Complexes with IAGs

Issue	Main Agreement	Date (Signature)	Article	Aspirational Goal
Climate Change[67]	UNFCCC + Copenhagen Accord	1992, 2009	Art. 2 UNFCCC,	"achieve [...] stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system [...]";
			Copenhagen Accord, Section 2	"reduce global emissions so as to hold the increase in global temperature below 2 degrees Celsius"
Ozone Depletion	Vienna Convention for protection of the ozone layer	1985	Art.2.1	"protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer"
Acid Rain	Convention on long-range transboundary air pollution (CLRTAP)	1979	Art.2	"shall endeavour to limit and, as far as possible, gradually reduce and prevent air pollution including long-range transboundary air pollution"
Shipping Pollution	International Convention for the Prevention of Pollution from Ships (MARPOL)	1973	Preamble	"achieve the complete elimination of intentional pollution of the marine environment by oil and other harmful substances and the minimization of accidental discharge of such substances"
Marine Fisheries	Convention on fishing and conservation of the living resources of the high seas + United Nations Fish Stocks Agreement	1958, 1995	Art.1 Convention,	"adopt […] such measures […] as may be necessary for the conservation of the living resources of the high seas"
			Art.2 Agreement	"ensure the long-term conservation and sustainable use of straddling fish stocks and highly migratory fish stocks"
Haze Pollution	Association of Southeast Asian Nations' (ASEAN) Agreement on Transboundary Haze Pollution	2002	Art.2	"prevent and monitor transboundary haze pollution as a result of land and/or forest fires which should be mitigated"
Desertification	UN Convention to combat desertification in those countries experiencing serious drought and/or desertification, particularly in Africa (UNCCD)	1994	Art.2	"combat desertification and mitigate the effects of drought in countries experiencing serious drought and/or desertification, particularly in Africa [...] "
Plant Protection	International plant protection convention (IPPC)	1951, 1979	Art.1	"prevent the spread and introduction of pests of plants and plant products"

B. Step Two: Assessing the Existence of Policy Change after IAG Adoption

The second stage of the empirical analysis seeks *prima facie* evidence for the effect of an IAG by assessing whether any costly policy change in the direction of the aspirational goal actually took place. In five of the eight issue areas reviewed below, we find no evidence to support this view.

[67] We study the Paris Agreement separately from the rest of the climate change regime, since the aim of our study is to deduce expectations for the 1.5C target.

The Marine Fisheries Regime Complex: The centerpiece of the international regime complex to manage fisheries is the UN Convention on the Law of the Sea (UNCLOS), first discussed in 1956 and signed in 1982. As part of its overarching objective of establishing a legal order for the seas, UNCLOS sets up the Exclusive Economic Zones (EEZ), areas consisting of 200 nautical miles from coastlines subject to national regulation of resource exploitation, including fisheries. Fisheries in the high seas, on the other hand, are managed under the 1995 UN Fish Stock Agreement, which regulates the operation of regional fisheries management organizations (RFMO), each focused geographically and/or by species. The Fish Stock Agreement and RFMOs contain an IAG of ensuring rational utilization of the fishery resources, which is typically interpreted in documents as remaining below specified maximum sustainable yields. Yet scholars agree many governments have done little to monitor or enforce them within their EEZ, while international authorities in charge of RFMO rules have done so even less.[68] Given that the fisheries are commons, and the market for fish is global, there is little reason to expect even marginal benefits from partial adoption and enforcement. Indeed, we observe serious stock depletions, within and outside of national jurisdictions in recent decades,[69] at the same time as ocean warming is redistributing fish stock ranges, exacerbating the problem.[70] Overall, the evidence suggests a failure of the fisheries regime's IAG to trigger costly policy change efforts consistent with movement to the policy target.

The Plant Protection Regime Complex: The issue of plant pest diffusion across borders emerged in the late 19th century, when phylloxera, a North American insect accidentally introduced to Europe, decimated the wine industry. The key framework agreement of the plant protection regime complex, the UN International Plant Protection Convention (IPPC), was signed in 1951 and further amended in 1979. To achieve its aspirational goal of preventing the spread of plant pests, the IPPC is tasked with establishing International Standards for Phytosanitary Measures, which only came into being 22 years later in 1993.[71] While 186 Parties to the IPPC committed to reporting obligations, over 100 still hadn't started doing so by 2010.[72] Technical capacity has remained a binding constraint, especially in Africa, where an IPPC-led initiative to that aim was only launched in 2023.[73] This slow pace of national and international implementation, along with a lack of centralized enforcement, the rare use of dispute resolution procedures, and the existence of many alternative regional and national regimes among developed countries and no adoption in many developing ones, suggests that the IAG could have had only a modest impact.[74]

The ASEAN Haze Pollution Regime Complex: Regional haze over Southeast Asia, much of it resulting from conversion of peatlands for palm oil production, has presented an often severe

[68] High Seas Task Force 2006, Willock et al. 2006.
[69] Worm et al. 2009.
[70] See https://www.nytimes.com/2016/12/30/science/fish-climate-change-northeast.html.
[71] See https://www.ippc.int/en/core-activities/standards-setting/ispms/.
[72] See https://www.ippc.int/en/countries/all/nppo/.
[73] See https://www.ippc.int/en/news/african-countries-harness-scientific-advances-digital-technology-improve-technical-capacity-to-prevent-plant-pests/.
[74] Holden 2024.

economic and public health hazard at least as far back as the 1990 ASEAN Kuala Lumpur Accord on Environment and Development. The need for a multilateral solution was underscored by an especially severe fire season in 1997-98 triggering negotiations on the ASEAN Agreement on Transboundary Haze Pollution. Its provisions include potential measures on monitoring, assessment, and prevention to "prevent and monitor [and "mitigate"] transboundary haze pollution as a result of land and/or forest fires."[75] Although the Agreement entered into force in 2003, the dominant regional actor, Indonesia, did not ratify the agreement until 2014. Moreover, the state parties have put limited effort into policies to monitor or prevent transboundary haze pollution: the Haze-Free Roadmap on implementation wasn't adopted until 2016, and the ASEAN Coordinating Centre for Transboundary Haze Pollution Control, mandated by the Agreement, was inaugurated only in 2023.[76] In addition to slow development of the international arrangements under the Agreement, national implementation has been weak or absent for a variety of reasons.[77] Unsurprisingly, little evidence suggests improvement in regional air quality.[78] Overall, the evidence suggests an ineffective IAG.

The Desertification Regime Complex: Following a five-year drought from 1968 to 1973 that killed over 200,000 people and millions of animals in the Sahel, the UN Conference on Desertification in adopted a Plan of Action to Combat Desertification (PACD) in 1977.[79] The largely top-down PACD proved ineffective: continuing disagreement on definitions, unreliable assessments, and short-term fixes characterized the following years.[80] As a result, African countries pressed for a convention more focused on bottom-up solutions: the UN Convention to Combat Desertification (UNCCD), signed in 1994, which aspired to "combat desertification and mitigate the effects of drought in countries experiencing serious drought and/or desertification, particularly in Africa."[81] Yet the UNCCD appears to have proven largely ineffective in encouraging costly and consequential policy adoption.[82] Desertification has increased since the UNCCD signature. Causes include urbanization, population growth, an inefficient food system and damaging agribusiness.[83] These macro-level factors are only mentioned in the non-binding Preamble, under pressure from developed countries.[84] Therefore, the evidence indicates that little policy change has taken place, negating any potential beneficial effect of the UNCCD's IAG.

---

[75] See https://hazeportal.asean.org/action/asean-agreement-on-transboundary-haze-pollution.
[76] See https://en.antaranews.com/news/292902/asean-inaugurates-acc-thpc-to-combat-haze-pollution.
[77] Alvin 2022; Hurley and Lee 2021; Sentian et al. 2019.
[78] See Today Online, *'Haze hits unhealthy levels in Singapore as PSI exceeds 100 for the first time in 3 years'* (Singapore, 14 September 2019), https://www.todayonline.com/singapore/haze-hits-unhealthy-levels-singapore-psi-exceeds-100-first-time-3-years; The New Straits Times, *'Waiting to Inhale: Much of Malaysia is blanketed by haze'* (Malaysia, 10 September 2019), https://www.nst.com.my/news/nation/2019/09/520142/waiting-inhale-much-malaysia-blanketed-haze; The Jakarta Post, *'Hazy mitigation efforts'* (Indonesia, 13 September 2019), https://www.thejakartapost.com/academia/2019/09/13/hazy-mitigation-efforts.html.
[79] See https://www.unccd.int/convention/history-unccd.
[80] Danish 1995, p.144-146.
[81] Danish 1995, p.148.
[82] Conliffe 2011.
[83] Global Land Outlook 2017.
[84] Danish 1995, p.156.

The Pre-Paris Climate Change Regime: Climate change has long been an international issue. Strong scientific input, particularly through the Intergovernmental Panel on Climate Change (IPCC), shaped early negotiations leading to the adoption in 1992 of the UN Framework Convention on Climate Change. Art. 2 defined the IAG goal as "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system." After 1992, policymakers and experts—mostly from the Global North—sought to translate this objective into a quantitative limit.[85] Since greenhouse gas concentrations are proportional to cumulative emissions, stabilizing concentrations at any particular level – the regime's IAG – implies that a fixed quantity of emissions must be allotted among parties. This corresponds to the classic regime theoretical approach of setting specific behavioral norms for state behavior, as opposed to a general aspiration. In 2009, fifteen years of negotiations aimed at deciding these allotments, known as Common but Differentiated Responsibilities, failed definitely at the Copenhagen summit, which reached no "common decision and remained vague or silent on key questions of climate policy like national commitments to emissions reduction, compensation for climate damages, and more" not even formally adopted by the parties.[86] This reflects the high cost of adjustment and the inability to strike compromises between historical responsibilities and current economic growth, collective efforts and the right to develop.[87] Instead, Copenhagen informally recognized a benchmark goal (first set forth in a scientific paper in the 1970s and introduced into international negotiations by German representatives in 1995) a "scientific view that the increase in global temperature should be below 2 degrees Celsius," as compared to pre-industrial levels.[88] This would be enshrined in the Paris Agreement six years later, the effect of which is analyzed below.

C. Step Three: Drawing Causal Inferences from Case Studies

We now turn to the remaining three cases, where an IAG was promulgated, and significant policy change subsequently occurred. In each case, after presenting prima facie evidence that change did take place, we evaluate empirically which of the six causal mechanisms linking IAGs to policy change could potentially have been at play. For the latter purpose, we conduct detailed process-tracing based and check whether the observed process in the real world is consistent with the necessary theoretical conditions and processes hypothesized by the six theories in the preceding section.[89]

[85] Oppenheimer and Petsonk 2005. As noteworthy step along this process, the EU Council stated in 1996 that it ``believes that global average temperatures should not exceed 2 degrees above pre-industrial level" (EU Council 1996, Jaeger and Jaeger 2011).
[86] Dimitrov 2016.
[87] UNFCCC 1992, Art.3.
[88] This wording mirrors that of a statement made by the G8 governments earlier that year: ``We recognize the broad scientific view that the increase in global average temperature above pre-industrial levels ought not to exceed 2°C" (G8 Summit 2009, Jaeger and Jaeger 2011).
[89] Mahoney 2010.

The Oil Discharge Regime Complex

Discharge of oil remnants from tanker ships into the sea was common practice from the start of the oil shipping industry. By the 1950s, the total amount of oil thus discharged was a major source of maritime pollution.[90] In 1954, countries adopted the International Convention for the Prevention of Pollution of the Seas by Oil (OILPOL), which imposed limits on the quantity of oil to be discharged near the shores. Yet it soon became clear that oil discharged away from the shores would not stay there, and in 1973, MARPOL was adopted, including the IAG of achieving "the complete elimination of intentional pollution of the marine environment by oil and other harmful substances and the minimization of accidental discharge of such substances." By 1978, when a protocol was added settling on means to realize the IAG: it placed quantitative limits on discharges across the sea, and imposed equipment requirements on all tankers drastically limiting the oil discharged, in particular segregated ballast tanks (SBT).[91] The latter requirements, though expensive, were met with almost full compliance.[92] Noteworthy, however, is the fact that intentional discharge continued to occur above the imposed limits.[93]

How did these two restrictions come about, and did MARPOL's IAG play a role in their genesis? In both cases, the timing and process of change belie a strong aspirational effect. Most of the development of discharge limits occurred prior to its adoption. Spearheaded during OILPOL by the UK, which had strong environmental NGOs, conversations moved away from discharge limits around shores to limits throughout the oceans. Mitchell attributes this change to two factors: the 1967 substantial oil spill of the Torrey Canyon in the Channel Sea, and the development in the 1960s by the oil shipping industry of a cost-effective operational procedure that reduced intentional discharge.[94] Similarly, MARPOL's equipment requirements followed in the wake of credible enforcement, in this case by the US. Driven domestically by a strong environmental movement, oil discharge accidents in the following years, and continuing enforcement issues, US President Carter had already proposed even stronger standards in 1977, and threatened to require unilaterally that all American tankers and all tankers entering US ports install SBT and additional equipment.[95] In this context, the MARPOL Protocol was a compromise between the US and countries representing shipbuilding and independent tanker owners' interests setting the terms of change. The discussions at MARPOL on equipment standards focused almost exclusively on technical requirements, with little mention of the IAG. It is unlikely that the MARPOL IAG played any autonomous role in the standards' successful adoption and compliance.

[90] Mitchell 1995.
[91] Mitchell 1994.
[92] Dannenberg and Barrett 2018.
[93] Mitchell 1994.
[94] Mitchell 1994.
[95] Mitchell 1994.

The Acid Rain Regime Complex

Beginning in the 1950s, industrialized countries imposed domestic limits on air pollution, focusing particularly on sulfur dioxide (SO_2) released by burning coal. Yet the problem of transborder air pollution from elsewhere, which took the form of acid rain, degraded forests and increased mortality of certain plant species.[96] This led countries downstream to propose negotiations to reduce such flows. In 1979, several dozen states signed the UN Convention on Long-range Transboundary Air Pollution (CLRTAP), designed to encourage information sharing and research, containing an IAG stating: "shall endeavour to limit and, as far as possible, gradually reduce and prevent air pollution including long-range transboundary air pollution."[97] Within this framework, supportive governments continued to reduce SO_2 pollution, while seeking to persuade others to do so. In the following years, Norway, Sweden, Germany and others proposed higher SO_2 reductions, totaling 30-50% from a 1980 base—a position that earned them the sobriquet of "30% club." In 1984, European governments established the European Monitoring and Evaluation Programme. By 1985, 21 governments and the EC signed the Protocol on the Reduction of Sulfur Emissions, which pledged to reduce emissions by at least 30% as soon as possible and at latest by 1995. While a few countries peripheral to Europe, including the UK, Poland, and the US, refused to sign, the signatories met the SO_2 targets.[98] Despite imperfect compliance, the release of acid-producing gases in Europe fell 45% between 1980 and 1994—and they have continued since.

Yet scholars seem largely in agreement that these policy changes did not result from CLRTAP, much less its IAG, but from unilateral interests and beliefs. CLRTAP "merely codified what states were planning to do anyway"[99] and, counterfactually, "if CLRTAP had not existed, significant reductions would have taken place due to 'non-environmental' processes and 'environmental political pressure' motivated by domestic damages."[100] For almost all members, any attribution of causality to the correlation is thus spurious: rather than international norms driving changes in preferences, common exogenous factors drove preference change *and* the creation of and compliance with CLRTAP. The timing of policy change confirms this: when CLRTAP came into effect in 1983, and before any protocols were negotiated, most West European countries had already committed to major reductions.[101] Overall, countries with substantial

[96] Oden 1968.
[97] On the regime negotiation, see Chossudovsky 1988.
[98] On this period, see Levy 1993; Barrett 2003, 10-1; Gehring 1994; Wettestad 1997.
[99] Barrett 2003, p.10.
[100] Wettestad 1997, p.243.
[101] Levy 1993, p.123. In 1983, Finland, Sweden, and Norway called for 30% reductions and Germany, Switzerland and Austria for 50% reductions in SO2. In 1984, France, having calculated that its nuclear program would reduce SO2 emissions, called for reductions.

perceived acid damage and industrial gains, such as Norway[102] and Germany,[103] implemented the agreement far more assertively than unenthusiastic participants like Russia.

Yet, one important country may have been influenced by the regime: the UK. Nicknamed the "dirty man of Europe," the UK was the continent's largest polluter and a "major net pollution exporter."[104] The UK had signed CLRTAP, but during the first decade of its existence Prime Minister Thatcher refused to sign further documents or move toward concrete policy coordination. The British government opposed action—not least because it would be costly for a country described as the largest single foreign source of the sulfuric and nitric acid falling over southern Scandinavia.[105] Thatcher ``specifically told her advisers […] that she did not care if her environmental positions were politically unpopular."[106] Yet in 1986, Thatcher's position began to soften. In 1988, she reversed course more fully: in a speech to the Royal Society she described acid rain (along with climate change and ozone depletion) as genuine and significant threats to humanity, rather than the result of contested science.[107] Five years later, under the Major government, the UK implemented reductions in SO_2 and a freeze on nitrous oxide emissions, and agreed to the 1994 revised sulfur protocol which embodied much deeper emissions reductions.[108]

What role did CLRTAP's 1979 IAG, and the ensuing 1985 agreement on a 30% target, play in the British government's turnaround, and if so, which causal mechanism was at work? Interstate arguments seem implausible: evidence does not support the view that Thatcher, a singularly combative conservative, or her government were suddenly persuaded by strategic, scientific or normative knowledge uniquely embedded in the CLRTAP's IAG several years before. To the extent the IAG played an important role, that role is more consistent with a two-level societal mobilization causal mechanism. No doubt mobilization itself was important. In the 1980s, environmental issues steadily became more prominent among interest groups, regulators, and scientists across the Western world. Perhaps even more important was the decision of parties to highlight the environment in British elections, notably the Social Democratic Party and the UK Green Party, which was rising in the polls and would poll 15% in the European elections of 1989.[109] Internal government debates appear to have focused on rising bilateral pressure from

[102] In Sweden and Norway, large "importers" of pollution, scientists and domestic activists had begun publicizing damage back in the 1960s and 1970s, encouraging their governments to take a leading role in convening an international process (Wettestad 1997, p.241).
[103] In Germany, the government's position changed early on SO2 following a widespread pressure from public opinion and environmental activists centered on discovery that acid rain was triggering "Waldsterben" – forest death in the historically and culturally significant Black Forest. This view was propagated not just by the nascent Green Party, but also by the establishment conservative Christian Social Union, which believed it would encourage more investment in nuclear energy, and which held the Ministry for Forestry (Boehmer-Christiansen 1990).
[104] Levy 1991.
[105] Agar 2019, p.223.
[106] Levy 1991, p.16.
[107] Levy 1991.
[108] Munton et al. 1999, p.196.
[109] McCulloch 1992, Levy 1991, Robinson 1992.

Germany, Scandinavia, and the EU, domestic disputes among scientific experts, and the increasing electoral support for environmentalism.[110]

The critical empirical issue is to assess how much CLRTAP contributed to this mobilization process within the UK. No doubt it marginally helped to spread knowledge on the strategic commitments of other countries, scientific support for drastic policy change, and normative importance of the issue. Yet little evidence suggests that the CLRTAP, let alone its IAGs, were a decisive factor in accounting for the dissemination of information and resulting mobilization. Other factors—the end of the miner's strike, the beginning of North Sea natural gas flows, unambiguous scientific findings, the shifting longer-term trajectory of the British energy industry, and the need for conservative parties to be electorally credible on the environment—all made 1986 a propitious moment for Thatcher to change course.[111] Finally, even if the IAG induced some marginal shift in British policy, such change was part of a regional and global trend. Britain is one among multiple European countries that moved in this direction during this period. The difference is that this change occurred later than elsewhere, plausibly because Britain was a net exporter of air pollution and because it was ruled by a particularly conservative government. Overall, it is difficult to argue that IAGs played more than a marginal role in this shift.

The Ozone Depletion Regime

Chlorofluorocarbons (CFCs) are a range of chemicals that were an essential component in the production of aerosols, electronics, aerospace, and solvents. In the mid-1970s, scientists discovered that CFCs depleted essential atmospheric ozone that acts as a shield from solar radiation, and during the next decade ozone in the stratosphere fell precipitously. Since such ozone depleting substances are long-lived, any eventual ban would be ineffective at mediating these effects if not made close to universal.

Starting in the mid-1970s, pro-regulation governments placed ozone reduction on domestic agendas. This triggered policy changes in a few countries. In the US, Congressional hearings, consumer boycotts, corporate decisions, and state or local bans, helped trigger a 20% decline in annual consumption.[112] In 1978—seven years before any international action—the US banned aerosols, while bans and voluntary reductions were announced by Canada, Norway, Germany, the Netherlands, Sweden, Denmark, Austria and Switzerland.[113] By the early 1980s, aerosol use was in decline, softening the overall market for CFCs.[114] Yet such national bans did not extend to countries where a domestic consensus in favor had not emerged, nor did it affect industrial uses of CFCs, notably in the aerospace and electronics industries.

[110] Agar 2019, pp. 222-234
[111] Levy 1993, p.123. Boehmer-Christiansen 2000.
[112] Parson 2003, p. 41.
[113] Parson 2003, Chapter 3.
[114] Parson 2003, p. 113-5.

Global negotiations gained momentum in the early 1980s. In 1985, countries signed the Vienna Convention for the Protection of the Ozone Layer, which took effect in 1988. Concretely, however, the Convention was understood by both sides to be a "symbolic" victory, rather than a change in concrete and consequential policy.[115] The document contained an IAG: to "protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer."[116]

Then, consequential cooperation took off. In 1987, Parties agreed to the Montreal Protocol. In contrast to the Convention, the Protocol created legally binding obligations to specified actionable tasks: an immediate production and consumption cap, a binding plan for reductions ending in 50% cuts (from 1986 levels) by 1999,[117] import and export bans, and additional trade provisions softening the transition for developing nations.[118] In addition, its preamble also contained a strong goal, calling for cooperation 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."[119] This remained aspirational in that in 1987, "no one knew what the technical challenges and costs would be of cutting CFCs by half in the nations that had already eliminated aerosols," and cost-effective industrial substitutes were not yet widely available at time that the major commitments were made.[120]

This ozone regime complex has enjoyed "continued success" at encouraging consequential policy coordination.[121] Montreal became the first universally ratified treaty in UN history. Over the next 25 years, five subsequent amendments organized the phaseout of almost all long-lived ozone-depleting substances and even, in 2016, non-depleting replacements that exacerbate climate change. As a result, atmospheric levels of ozone-depleting substances peaked in the 1990s and have slowly declined since. The ozone layer has moved toward recovery: by 2050, it is expected to return to the level it was before the precipitous drop of the 1980s.[122]

Did the inclusion of IAGs contribute significantly to the success of this regime—and, if so, why? We find plausible pathways of influence toward strengthening and implementing the Protocol through both mobilizing and catalyzing mechanisms. The former could explain the

[115] Parson 2003, pp. 120-129, 247-248.
[116] Article 2.1 https://treaties.un.org/doc/Publication/UNTS/Volume%201513/volume-1513-I-26164-English.pdf
[117] This 50% target emerged as a pragmatic midpoint between an initial 95% proposal by the US and a freeze on production floated by other states, justifiable given the scientific and technological uncertainties (Parson 2003).
[118] Although never actually implemented, the trade provisions were instrumental in countering lucrative black markets of controlled substances in Russia in 1994 (Benedick 1998, p.273-285).
[119] https://treaties.un.org/doc/Publication/UNTS/Volume%201513/volume-1513-I-26164-English.pdf, repeated in the Montreal Protocol on Substances that Deplete the Ozone Layer 1987, Preamble.
[120] Parson 2003, ch.1, p.9-11; ch.6, p.157; p.174. Despite widespread belief to the contrary, the Dupont company did not support the change because it had such a substitute on hand.
[121] Chipperfield and Bekki 2024, p. 2785.
[122] Chipperfield and Bekki 2024, p. 2786. Still, challenges to the Protocol's outstanding success continue to emerge. In 2018, China, responding to international pressure, clamped down on illegal production of CFC-11, five years after emissions from these sources reached detectable levels (Tollefson 2021). Recent observations suggest illegal production of HCFC-141b of unknown origin. In addition, several other minor ozone-depleting gases for which production remains legal could become important in the future (Western et al. 2023). Finally, recent research has pointed to the multiplication of satellites as potential future cause of substantial ozone depletion (Ferreira et al. 2024).

shifting behavior of the UK government from laggard to leader in 1988.[123] According to Benedick, Barrett, and Parson, a pivotal event was the publication of the Ozone Trends Panel (OTP) report assessing the significance of the discovery of the ozone hole over Antarctica and declines in ozone levels globally that were much bigger, sooner, and more widespread than predicted by models.[124] Following this, US-based environmental NGOs, their UK affiliates and public figures started calling for consumer boycotts of CFC aerosols in the UK.[125] Shortly thereafter, Prime Minister Thatcher announced that the UK would host an international meeting on the issue. This Conference on Saving the Ozone Layer took place in March 1989, and was attended by over 120 countries and 90 NGOs.[126] At the Conference, a strong consensus emerged among countries that the ``ultimate objective" should be a CFCs ban[127] – a direct reference to the Protocol's goal.

The catalyzing mechanism can be observed in the 2nd Meeting of Parties to the Protocol at London in June 1990, where substantial social pressure took place with respect to the proposed timing of a total ban. NGOs engaged in actions, press conferences and diffusion of briefing sheets, all well-covered by the media and supporting a total phase-out of CFCs as soon as possible.[128] European countries positioned their proposed phaseout schedules as examples to follow.[129] Because the technological panel was not positive that an earlier phaseout was technically feasible, a later phaseout date, 2000, was ultimately agreed upon, along with a 50 percent reduction by 1995 compared to 1989 levels.[130] Following the Meeting, many Western countries stated that they would phase out of CFCs by 1997; the EC associated itself with this declaration.[131] Two years later in Copenhagen, Parties – including the US – agreed to an earlier phaseout of CFC by 1996.[132]

[123] In December 1987 at the EC council meeting, the UK led the opposition to proposals for a CFC phaseout target (Parson 2003, Ch.6 pp.159). In June 1988, UK government officials were still lobbying against mandatory labeling of spray cans in Parliament (Benedick 1998, pp.104). By the following Spring, UK Prime Minister Thatcher was threatening US President Bush with retaliation if he did not support proactive action at the upcoming Meeting of Parties (Parson 2003, Ch.8 pp.204).
[124] Benedick 1998, p.110-111; Parsons 2003, ch.6, p.163.
[125] Friends of the Earth was a major organizer of this campaign (Benedick 1998, pp.102). As another example, Prince Charles announced in 1988 that his household would no longer use CFC aerosol sprays (Benedick 1998, pp.114). Consumer boycotts of CFCs also occurred fifteen years earlier in the US and in Nordic countries, yet not in context of an international agreement (Andersen and Sarma 2002. pp.342-343).
[126] Benedick 1998, p.123.
[127] Benedick 1998, p.123; Parsons 2003, ch.6, p.163.
[128] Six months before the London meeting, NRDC released a Who's Who of American ozone depleters (Sheiman et al. 1990). In the UK, Greenpeace launched a major campaign against ICI, the country's biggest producer of CFCs (Erwood 2011). On the first day of the Conference, Friends of the Earth demonstrators dressed as penguins with signs reading: ``Ban all ozone destroyers" (Andersen 2002, pp.386). The next day, the Washington Post titled, ``U.S. Stance Criticized at Ozone Conference; Washington Accused of Delaying CFC Ban" (28 June 1990, pp.A34). Later, the Australian Conservation Foundation brought school students in, who pleaded for ``an immediate end to the use of ozone-depleting chemicals", eloquently stressing, ``Our fate lies in your square brackets" (Andersen 2002, pp.122). NGOs did not just target industrial producers, but also attempted to pit countries' efforts against one another. They argued that since West Germany had announced a phase-out by 1995, other industrialized countries could do the same (Parsons 2003, pp.205).
[129] West Germany's Environment Minister Klaus Töpfer declared that the announced CFC phase-out by 1995 was intended as an example to other countries in the EC and elsewhere that early phase-out of the ozone-depleting substances was possible (Benedick 1998, pp.165). The EC argued for an early phase-out in order ``to take an ostensibly stronger position on CFCs than the US (Benedick 1998, pp.171).
[130] Parson 2003, pp.156-159-170-172
[131] Andersen and Sarma 2002, p.128.
[132] Benedick 1998, p.172.

Can we make a good case that the regime's IAG was a key driver behind these rapid policy changes? We find considerable support from states' observable behavior. First, the US, right after the IAG adoption, initially pushed for strong CFC phaseout[133] on the basis that its scientists had not identified any threshold level of emissions below which zero damage to human beings would occur – a direct reference to the IAG. Second, prior to the IAG adoption and the signing of the Protocol, the UK and other recalcitrant countries (as well as non-state actors) lacked specific knowledge with respect to how fast they would be able to phase out CFCs. Third, these states did not block, and in many cases, became strong advocates of further policy change once the Protocol was signed. By 1989, the UK had become a leader of international action, and by 1992 all countries had agreed to phasing out CFCs by 1996. Fourth, the emergence of a broad consensus around a phaseout as soon as technically feasible certainly followed closely on the heels of the Protocol's signing, consistent with, albeit not proof of, a causal IAG effect. Fifth, NGOS, who had been vocal in pushing for stronger action in certain countries (US, UK) yet were scarcely present at international negotiations until 1989, developed international collaborations starting that time.[134]

However, it is simply impossible to show that the IAG was uniquely influential in these developments. An argument can be made that, without the IAG, agreement on rapid phaseout would have occurred in roughly the same fashion. On the US side, the need for a strong market signal to replace CFCs not just in aerosols but across sectors played a key role in the US position for a strong phaseout.[135] In addition, Parson and Benedick argue strongly for the importance of expert assessments, especially the unique importance of the OTP report, as a trigger for shifting the positions of multiple governments to a phaseout of ozone-depleting chemicals. Grundmann argues for the importance of the policy advocacy role of many of the scientists involved. The OTP played a crucial role consolidating, evaluating, summarizing, and ultimately certifying the reality that human-caused ozone depletion was more than a theory and had already been observed. Subsequently, Parson and others have argued, the Technology Assessment Panel established under the Protocol, which began its work in late 1988, exercised a key influence on the timing of phaseout later agreed to by Parties.

Therefore, in addition to the IAG and similar to the acid rain case, we note the presence of a broad coalition of states and non-state actors followed by policy changes. In this context, the IAG was clearly associated with subsequent policy shifts but was perhaps not a necessary cause of the phaseout.

---

[133] In 1986, the US Environmental Protection Agency began to emphasize a scientific estimate that an 85% reduction in production of CFC-12, one of the two most important ozone-depleting chemicals, would be required to prevent ever-increasing damage to the ozone layer. The 85% reduction became the chief scientific rationale for the official US negotiating position issued in December 1986 calling for a precautionary, staged phaseout to 95% which would eliminate all but "essential uses" for which no substitutes existed (Parson 2003, p.129).

[134] Benedick 1998, p.311-312.

[135] Production for uses other than aerosols had begun to grow rapidly. Yet most European consumption of CFCs was still for use in aerosol sprays even while US production for aerosols had sagged in 1975 and was banned in 1978. As a result, Europe could have met a 50% target on total production by banning production for use in sprays alone, allowing growth in other uses (Parson 2003, p.142). Some Europeans involved with CFC policy considered the near phaseout a means for the US to gain advantage in international trade of substitutes.

Summarizing the Empirical Results

We code the evidence over each case for each mechanism as one of three states: supporting a possible effect of IAG on policy change when several observable implications are found, hinting at an unlikely effect when most implications are not found, and no effect expected. We summarize our process-tracing results in Table 2. We find a possible IAG effect only in the ozone and, to a lesser extent, in the acid-rain cases. Furthermore, the evidence suggests that if IAGs induced policy change, *it must have happened through the following causal mechanisms*: a mobilizing role by marshaling domestic actors to influence recalcitrant governments, and a catalyzing role by bolstering domestic support in like-minded countries. We find no empirical support for the regime, epistemic, sociological, or orchestration theories. Importantly, we find evidence of an IAG effect once the most engaged parties are mobilized. This suggests a very important limitation on what IAG can do: only influence undecided ``swing" countries and constituencies *once a large congregation of interested parties is mobilized*.

Table 2 – Summary of empirical evidence on causal mechanisms linking IAG to policy change

	Ozone	Acid rain	Shipping pollution
Strategic knowledge	None	None	None
Scientific knowledge	None	None	None
Normative knowledge	None	Unlikely	None
Orchestration	None	None	None
Mobilization	Possible	Marginal	None
Catalyzation	Possible	None	None

IV. Implications of the Analysis for the Climate Change Regime Since Paris

We have seen that the regime complex on climate change has set a number of IAGs. Here we apply the framework to the latest of these: the 1.5°C/2°C target set in the Paris Accord (Art. 2), which appears along with an implementation objective of balancing sources and sinks of greenhouse gases (Art.4).[136]

Has policy change taken place? Signatory states and non-state actors have certainly started organizing processes to measure progress towards the IAG. As part of the agreement process, countries have proposed summaries of what they are ready to do to reduce their emissions by 2030: "Nationally Determined Contributions" (NDCs). These efforts are thoroughly tracked and scrutinized by civil-society organization through informal review processes.[137] The Paris

[136] This balance alone is not enough to obtain the temperature target, for which sinks need to exceed sources for decades (Riahi et al. 2022). This was acknowledged in UNFCCC's 2021 Glasgow decision, which ``recognizes that limiting global warming to 1.5C requires rapid, deep and sustained reductions in global greenhouse gas emissions"; and further specified in its COP decisions the following years (UNFCCC 2023).
[137] Van Asselt 2016.

Agreement also prescribes increasing NDC ambition every five years,[138] combined with a global assessment of collective progress towards the long-term goals.[139] Legally binding Monitoring, Reporting and Verification (MRV) occurs on many topics ranging from individual countries' emissions reporting to financial resources.[140]

Have costly and consequential policies been implemented in the area of climate change consistent with coordination on this goal? The answer is clearly yes.[141] Moreover, the timing is right in that these policies deviate markedly from the pre-2014 trend. Still, compliance remains uneven, with policies reaching about 80% of reductions pledged in NDCs.[142] And, moreover, the result is on track to achieve less than half what is necessary: emissions are expected to fall 20% below previous trend line, but an additional 33% reduction from the trend would be required to reach the 1.5C target.[143] Still, virtually all parties have submitted an NDC, and several prominent opponents of mitigation efforts have even increased their pledge's ambition since Paris.[144]

If a case is to be made for the impact of the Paris IAG consistent with the other regimes, it would focus on orchestration of subnational or private action and catalyzation of technical change. First, the Agreement aims at making actions of sub- and non-state actors a central part of the governance scheme.[145] Second, the Paris Agreement is built on a catalytic and facilitative structure, nudging parties to reduce their emissions through coordinated policy shifts.[146] Moreover, transparency is a pillar of the Paris Agreement. The 1.5C target has been mentioned in several legal challenges against governments, both by petitioners (often environmental NGOs) and by courts in their rulings. While these are not large enough to have an aggregate effect, they may matter in some cases.[147]

Certainly, the Paris Agreement seeks to orchestrate and catalyze non-state actors, but is the 1.5C IAG essential to do so? That remains questionable. First, the 1.5C target is not quite uniquely

[138] Roughly half of the countries had heightened their NDC's ambition level ahead of COP27 (UNEP 2023). For an analysis of NDCs' credibility as assessed by policy experts, see Victor, Lumkowsky and Dannenberg 2022.
[139] This process is called ``global stocktake''. This is a progressive approach similar to the CLRTAP and Montreal Protocol.
[140] Practical provisions for transparency were settled in 2021 (UNFCCC 2021 b).
[141] The latest updates bring current policies to a reduction of 10 Gt CO2eq from the 66 Gt CO2eq that would result in 2030 following the policy status quo in year 2010 (UNEP 2023, Table 4.3).
[142] NDCs aim to induce a larger reduction in global greenhouse gas emissions of 11-14 Gt CO2eq in 2030 (UNEP 2023, Table 4.3).
[143] Limiting warming to 1.5C would require an additional reduction of 19-22 Gt CO2eq in 2030 (UNEP 2023, Table 4.3).
[144] As of November 2023, the only Parties to the UNFCCC that had not submitted any NDC were Iran, Libya, and Yemen (UNFCCC NDC Registry). These countries have not ratified the Paris Agreement either (UN Treaty Collection). Among the most prominent opponents to climate action, Venezuela and Saudi Arabia have both updated their NDCs ahead of COP26, increasing their ambition (UNEP 2023).
[145] Hale and Roger 2014. As of November 2021, around 11,200 cities, 280 regions, 10,000 companies, 1,500 investors and 3,200 organizations had registered commitments on the UNFCCC Global Climate Action portal, formally included in the Decision Text of the Agreement. The total number of actors has multiplied several times over since 2015. Many of these actors directly use the Paris IAG as benchmark for their commitments, such as the corporate organization Science Based Targets initiative (https://sciencebasedtargets.org/).
[146] Hale 2016, 2020.
[147] For instance, in a case brought by an association of Swiss senior women arguing that their health was threatened by heat waves worsened by climate change, the European Court of Human Rights ruled in April 2024 that the Swiss government had failed to comply with its obligations concerning climate change under the European Convention on Human Rights, referring to the 1.5C target on multiple occasions. See https://climatecasechArt.com/non-us-case/union-of-swiss-senior-women-for-climate-protection-v-swiss-federal-council-and-others/ .

able to transmit knowledge to key actors. Indeed, the concrete steps taken, such as allowing sub-national and sub-state actors to participate, do not require an IAG. Second, if the causal link is shaming recalcitrant states for their lack of action, then the 1.5C target may be a blunt instrument, because linking individual countries' policies to realizing the IAG is far from straightforward.[148]

However, one observable implication speaks more strongly in favor of an IAG effect. As in the ozone and acid rain cases, we observe an evolution in two stages: a coalition of parties and non-state actors mobilized around like-minded states supporting the IAG, followed by a surge in climate actions often tied to the 1.5C target. In the first stage, Small Island Developing States (SIDS) and Least Developed Countries (LDC) were the driving force behind the adoption of the 1.5C target in Paris.[149] These most vulnerable Parties used this target in the negotiation process as their most powerful lever: their ``red line,'' what they were under no circumstance ready to let go.[150] This goal, which many observers were surprised to find in the final agreement,[151] had a clear political purpose domestically for SIDS and LDC: to appear to their constituents as having sheltered their nation from future danger from sea-level rise or diminished agricultural yields.[152] These countries were soon joined by enough states so as to form the majority of Parties by the end of the Paris talks.[153] By the time they adopted the Paris Agreement, Parties, also reaching out to the scientific community, invited the IPCC to provide a report on the impacts of a 1.5C warming.[154]

In fact, this report is arguably the basis of the second stage in stakeholders' behavior change. More than that, it might represent the start of the most compelling piece of evidence yet for a causal IAG effect on policy change. Its publication in 2018 received a striking amount of attention in the media and general public, to a quite unusual degree for an IPCC report. Since then, the 1.5C target has become a central element in the public discourse, and appears to have spurred recent announcements by multiple actors, from major economies to private companies, of plans to reach net zero emissions by mid-century.[155] Most strikingly, the youth movement for climate

[148] This is true for three reasons. First, linking medium-term emissions reductions of NDC to long-term warming is no simple task, as it requires strong assumptions on many dimensions. Second, formally shaming a given country for its lack of efforts does not fit with the Paris strategy of avoiding discussions of burden sharing, which has systematically led to dead-ends in the past. Third, experimental evidence suggests that a Paris-type pledge-and-review process is more likely to affect countries' pledges than their actions (Barrett and Dannenberg 2016). Yet the authors find that the review process indirectly increases actions through two mechanisms: first, people who pledge more tend to contribute more; and second, people's expectations for how much others will contribute increase with pledges made by others. For a comparison of pledge-and-review to more traditional bargaining solutions, see Harstad 2023.
[149] Dimitrov 2016.
[150] Allan et al. 2021.
[151] Guillemot 2017.
[152] Washington Post, 8 December 2015. In exchange for this more ambitious target, SIDS and LDC agreed to renounce any legal claim of compensation against historical and current large emitters, as well as to drop the mention of eventually getting rid of fossil fuel subsidies, which was present in a preliminary draft. At COP26 in 2021, a watered-down version of this point was eventually included in Parties' decision: ``accelerating efforts towards the phasedown of unabated coal power and phaseout of inefficient fossil fuel subsidies'' (UNFCCC 2021b). It was reiterated at COP27 and COP28 (UNFCCC 2023).
[153] Dimitrov 2016.
[154] UNFCCC 2015. Profound interrogations on the feasibility of the 1.5C target had revealed gaps in the literature on its scientific meaning. The resulting Special Report provides crucial insights to document this goal (IPCC 2018; Hermansen et al. 2021).
[155] UNEP 2023; Hausfather 2020.

action, which gained momentum after the report's publication,[156] has systematically referred to the 1.5C target in all its communications.[157] The youth movement's actions might be read as an attempt to transform the 1.5C target from an aspiration to a norm, which would induce stronger expectations of compliance.[158]

V. Discussion and Conclusion

In this analysis, we studied whether the presence of aspirational goals in IEA is useful to resulting policy change. Our study originated with the premise that such goals matter, given the amount of effort devoted to including them in IEA. In particular, our underlying objective was to assess the usefulness of the Paris Agreement's 1.5C target. While substantial literature has been published on this target's appropriateness, little effort has focused on whether it can at all affect countries' behavior.

In short, among the hundreds of existing IEA covering over 70 issues, our first surprising finding is descriptive – namely that we found only eight issues that do contain aspirational goals as we define them here. Among them, we find only two cases where, after further analysis, we cannot rule out an IAG effect on policy change. If it does play out, this effect has to have gone through the state-society theories we proposed: a catalyzing mechanism by bolstering domestic support in like-minded countries and a mobilizing mechanism by marshaling domestic actors to influence recalcitrant governments. This result aligns with recent literature insisting that states should not automatically be considered the fundamental players in global environmental governance.[159] Importantly, the presence of IAGs in agreements improves the odds of policy change only when a substantial coalition of intensely interested parties exists. Therefore, IAGs cannot simply be considered as a natural outgrowth from scientific knowledge or political ideals. Rather, in order to be effective, they need to serve a political purpose.

As for the 1.5C target, its inclusion in the Paris Agreement does reflect a political purpose. This goal emerged from intense intergovernmental efforts on the part of SIDS and LDC. These countries had strong domestic political stakes attached to this temperature target. However, this clear political purpose appears more to call for the presence of this specific target in the Paris Agreement, than for its implementation. In addition, the Paris temperature target distinguishes itself from other IAG in that it could fail: there might be a point -- perhaps dangerously close -- where the 1.5C target just becomes a physical impossibility.[160] On the contrary, IAGs in the cases

[156] Momentum in the youth movement started most visibly with the launch of the Fridays for Future movement in late 2018 (https://fridaysforfuture.org/).
[157] A famous example involves young activist Greta Thunberg's testimony to the US House of Representatives in September 2019, which consisted of an eight-sentences statement, accompanied by the IPCC's 1.5C report as support document (Joint hearing 2019).
[158] Finnemore and Jurkovich 2020.
[159] Aklin and Mildenberger 2020.
[160] ``The likelihood of limiting warming to 1.5C with no or limited overshoot has dropped in AR6 compared to SR1.5 because global GHG emissions have risen since the time SR1.5 was published, leading to higher near-term emissions (2030) and higher

studied here are always, at least in theory, reachable. In a context of low perceived ability to achieve a goal, the literature on the psychology of goals suggests that a target can induce impaired motivation and performance.[161] Thus the 1.5C target might turn out to discourage Parties from pursuing efforts.[162] However, tracing the causality of a regime's failure to an IAG would likely prove even more tentative than studying its effect on policy change. Such an endeavor is beyond the scope of this study. Still, we discussed the intense attention received by the 1.5C goal, especially since the 2018 IPCC report. Whether this recent development hints at an actual impact of the temperature target on countries' behavior whereby the political purpose, though lacking intent to implement, is overtaken by a larger political movement that forces implementation, or whether it is the manifestation of a large movement predating its adoption in Paris, it is too soon to judge. Yet it becomes apparent that an increasing variety of actors – from the youth movement to private companies – are reframing their wishes, actions, and disappointed hopes with respect to this very target. We expect to see interesting developments in the use of aspirational goals for climate change advocacy and, perhaps, for policy change in the coming years.

More generally, our study provides descriptive evidence as to which types of environmental issues – generating which levels of consensus – harbor an IAG in the first place. Future research might explore through which specific mechanisms IAGs end up in agreements. Once IAGs are present, our analysis sheds light on their effect in global environmental issues, an area where goals have previously been little investigated in political science. As such, we provide an interesting point of comparison to similar work in other areas more thoroughly studied. In particular, the human rights literature is inconclusive regarding the role of IAGs in international agreements. While Simmons[163] argues that such goals have a crucial role, others counter that their importance depends entirely on the domestic context,[164] and yet others consider them to be counterproductive.[165] While IAGs arguably address a functional need at least as strong in environmental agreements as in human rights accords, our results suggest that their impact on countries' behavior is closest to the vision of Finnemore and Sikkink: highly dependent on a domestic political purpose, and rarely key to policy change.[166] Therefore, for future environmental regimes, policymakers' time and energy might be better spent building a domestic constituency supporting an agenda around the aspirational target, prior to negotiating the inclusion of said target in an IEA. Once an IAG is present, it might be up to advocates and other policy entrepreneurs to increase its salience, in the hope of catalyzing policy change.

cumulative CO2 emissions until the time of net zero (medium confidence). Only a small number of published pathways limit global warming to 1.5°C without overshoot over the course of the 21st century" (IPCC AR6 WG3 ch.3). We thank Johannes Urpelainen for making this point.

[161] Elliott and Dweck 1988; Grant and Dweck 2003.

[162] This makes negative emissions a psychologically important factor in the target's perceived achievability.

[163] Simmons 2009, p.3.

[164] Finnemore and Sikkink 1998; J W Busby 2010; Thomas 2001, p.22.

[165] Hathaway 2002.

[166] Navroz Dubash (2023) argues a similar take.

Data availability: The data generated and analyzed for this study is available in its entirety in the Appendix.

Acknowledgments: We thank Scott Barrett, Patrick Bayer, Robert Keohane, Ronald Mitchell, Detlef Sprinz, Dustin Tingley, Johannes Urpelainen, Elke Weber, and participants to the 2021 Climate Pipeline workshop, the 2022 Environmental Politics and Governance conference, the 2022 and 2024 American Political Science Association conferences, the 2022 Conference on Earth System Governance, and the 2024 Political Economy of Climate and the Environment conference for helpful feedback.

References

Abbott, Kenneth W., Steven Bernstein, and Amy Janzwood. 2020. "Orchestration." In *Architectures of Earth System Governance: Institutional Complexity and Structural Transformation*, edited by Frank Biermann and Rakhyun E. Kim. Cambridge: Cambridge University Press.

Abbott, Kenneth W., Philipp Genschel, Duncan Snidal, and Bernhard Zangl. 2015. "Orchestration: Global Governance through Intermediaries." In *International Organizations as Orchestrators*, edited by Kenneth W. Abbott. Cambridge: Cambridge University Press.

Abbott, Kenneth W., Robert O. Keohane, Andrew Moravcsik, Anne-Marie Slaughter, and Duncan Snidal. 2000. "The Concept of Legalization." In *International Organization* 54, no. 3: 401–419.

Agar, Jon. 2019. *Science Policy under Thatcher.* London: UCL Press.

Aklin, Michael, and Matto Mildenberger. 2020. "Prisoners of the Wrong Dilemma: Why Distributive Conflict, Not Collective Action, Characterizes the Politics of Climate Change." In *Global Environmental Politics* 20, no. 4: 4–27.

Allan, Jen Iris, Peter Dauvergne, and Anita Nightingale. 2021. "Making the Paris Agreement: Historical Processes and the Drivers of Institutional Design." In *Political Studies* 71, no. 3: 914–934.

Alvin, S. D. 2022. "Effectiveness of the ASEAN Agreement on Transboundary Haze Pollution." In *Environmental Law Review* 24, no. 4: 305–313.

Andersen, S. O., and K. M. Sarma. 2002. *Protecting the Ozone Layer: The United Nations History.* London: Earthscan Publications.

Barnett, Michael, and Martha Finnemore. 1999. "The Power, Politics, and Pathologies of International Organizations." In *International Organization* 53, no. 4: 699–732.

Barrett, Scott. 2003. *Environment and Statecraft.* Oxford: Oxford University Press.

Barrett, Scott, and Astrid Dannenberg. 2016. "An Experimental Investigation into Pledge and Review in Climate Negotiations." In *Climatic Change* 138: 339–351.

Benedick, Richard E. 1998. *Ozone Diplomacy.* 2nd ed. Cambridge: Harvard University Press.

Bennett, Andrew, and Jeffrey T. Checkel, eds. 2015. *Process Tracing: From Metaphor to Analytic Tool.* Cambridge: Cambridge University Press.

Biermann, Frank, Niki Frantzeskaki, and Rakhyun E. Kim. 2022. "Scientific Evidence on the Political Impact of the Sustainable Development Goals." In *Nature Sustainability* 5, no. 9: 795–800.

Boehmer-Christiansen, Sonja. 2000. "The British Case: Overcompliance by Luck or Policy?" In *International Environmental Agreements and Domestic Politics: The Case of Acid Rain*, edited by Arild Underdal, 279–312. Aldershot: Ashgate Publishing.

Bradford, Anu. 2020. *The Brussels Effect: How the European Union Rules the World.* Oxford: Oxford University Press.

Busby, Joshua William. 2010. *Moral Movements and Foreign Policy.* Cambridge: Cambridge University Press.

Busby, Joshua William. 2007. "Bono Made Jesse Helms Cry: Jubilee 2000, Debt Relief, and Moral Action in International Politics." In *International Studies Quarterly* 51: 247–275.

Chandra, Alvin, and Anastasiya Idrisova. 2011. "Convention on Biological Diversity: A Review of National Challenges and Opportunities for Implementation." In *Biodiversity Conservation* 20: 3295–3316.

Chasek, Pamela S. 1997. "The Convention to Combat Desertification: Lessons Learned for Sustainable Development." In *The Journal of Environment & Development* 6, no. 2: 147–169.

Chipperfield, M. P., and S. Bekki. 2024. "Stratospheric Ozone: Depletion, Recovery, and New Challenges." In *Atmospheric Chemistry and Physics* 24, no. 4.

Chossudovsky, Evgeny. 1988. *East-West Diplomacy for Environment in the United Nations.* New York: United Nations.

Colgan, Jeff D., Jessica F. Green, and Thomas N. Hale. 2021. "Asset Revaluation and the Existential Politics of Climate Change." In *International Organization* 75, no. 2: 586–601.

Conliffe, Alexandra. 2011. "Combating Ineffectiveness: Climate Change Bandwagoning and the UN Convention to Combat Desertification." In *Global Environmental Politics* 11, no. 3: 44–63.

Crawford, Vincent. 1998. "A Survey of Experiments on Communication via Cheap Talk." In *Journal of Economic Theory* 78, no. 2: 286–304.

Danish, K. W. 1995. “International Environmental Law and the Bottom-Up Approach: A Review of the Desertification Convention.” In *Indiana Journal of Global Legal Studies* 3, no. 1: 133–156.

Dannenberg, Astrid, and Scott Barrett. 2018. “Cooperating to Avoid Catastrophe.” In *Nature Human Behaviour* 2, no. 7: 435–447.

Dimitrov, Radoslav S. 2016. “The Paris Agreement on Climate Change: Behind Closed Doors.” In *Global Environmental Politics* 16, no. 3: 1–11.

Dimitrov, Radoslav S. 2020. “Empty Institutions in Global Environmental Politics.” In *International Studies Review* 22, no. 3: 626–650.

Dubash, Navroz K. 2023. “Rebalance Attention from Global Target Setting Toward National Climate Politics and Policy.” In *Science* 382, no. 6666.

Eide, Elisabeth, and Risto Kunelius. 2021. “Voices of a Generation: The Communicative Power of Youth Activism.” In *Climatic Change* 169, no. 1.

Elliott, E. S., and C. S. Dweck. 1988. “Goals: An Approach to Motivation and Achievement.” In *Journal of Personality and Social Psychology* 54, no. 1: 5–12.

Erwood, S. 2011. *The Greenpeace Chronicles: 40 Years of Protecting the Planet.* Amsterdam: Greenpeace International. https://www.greenpeace.or.th/report/Greenpeace-Chronicles.pdf.

European Monitoring and Evaluation Programme (EMEP). n.d. *Co-operative Programme for Monitoring and Evaluation of the Long-Range Transmission of Air Pollutants in Europe.*

European Union Council. 1996. “Community Strategy on Climate Change-Council Conclusions.” PRES/96/188. https://ec.europa.eu/commission/presscorner/detail/en/PRES_96_188.

Fearon, James D. 1994. “Explaining Cooperation Under Anarchy: Hypotheses and Strategies.” In *American Political Science Review* 88, no. 3: 577–592.

Fearon, James D. 1995. “Rationalist Explanations for War.” In *International Organization* 49, no. 3: 379–414.

Ferreira, José P., Ziyu Huang, Ken-ichi Nomura, and Joseph Wang. 2024. “Potential Ozone Depletion from Satellite Demise During Atmospheric Reentry in the Era of Mega-Constellations.” In *Geophysical Research Letters* 51, no. 11.

Finnemore, Martha, and Megan Jurkovich. 2020. “The Politics of Aspiration.” In *International Studies Quarterly* 64, no. 4: 759–776.

Finnemore, Martha, and Kathryn Sikkink. 1998. “International Norm Dynamics and Political Change.” In *International Organization* 52, no. 4: 887–917.

G8 Summit. 2009. “Responsible Leadership for a Sustainable Future.” Outcome declaration. http://www.g8.utoronto.ca/summit/2009laquila/2009-declaration.pdf.

G20 New Delhi Leaders' Declaration. 2023. https://www.consilium.europa.eu/media/66739/g20-new-delhi-leaders-declaration.pdf.

Gehring, Thomas. 1994. *Dynamic International Regimes: Institutions for International Environmental Governance.* Frankfurt am Main: Peter Lang GmbH.

Global Climate Action Portal. Accessed November 2022. https://climateaction.unfccc.int.

Global Land Outlook. 2017. Technical report. Bonn: UNCCD.

Grant, Heidi, and Carol S. Dweck. 2003. "Clarifying Achievement Goals and Their Impact." In *Journal of Personality and Social Psychology* 85, no. 3: 541–563.

Griffin, Andrew. 1994. "MARPOL 73/78 and Vessel Pollution: A Glass Half Full or Half Empty?" In *Indiana Journal of Global Legal Studies* 1, no. 2: 489–513.

Guillemot, Helene. 2017. "The Necessary and Inaccessible 1.5 C Objective: A Turning Point in the Relations Between Climate Science and Politics?" In *Globalising the Climate*, edited by Stefan C. Aykut, Jean Foyer, and Edouard Morena, 39–56. London: Routledge.

Haas, Peter M. 1989. "Do Regimes Matter? Epistemic Communities and Mediterranean Pollution Control." In *International Organization* 43, no. 3: 377–403.

Haas, Peter M., and Ernst B. Haas. 2002. "Pragmatic Constructivism and the Study of International Institutions." In *Millennium* 31, no. 3: 573–601.

Hadden, Jennifer, and Aseem Prakash. 2024. "The Value of Unrealistic Targets: Why Some Climate Activists Are Unwilling to Abandon the 1.5° C Target." In *NPJ Climate Action* 3, no. 1: 29.

Hafner-Burton, Emilie M., David G. Victor, and Brad L. LeVeck. 2016. "How Activists Perceive the Utility of International Law." In *The Journal of Politics* 78, no. 1: 167–180.

Hale, Thomas. 2016. "All Hands on Deck: The Paris Agreement and Nonstate Climate Action." In *Global Environmental Politics* 16, no. 3: 12–22.

Hale, Thomas. 2020. "Catalytic Cooperation." In *Global Environmental Politics* 20, no. 4.

Hale, Thomas. 2024. *Long Problems: Climate Change and the Challenge of Governing Across Time.* Princeton: Princeton University Press.

Hale, Thomas, and Charles Roger. 2014. "Orchestration and Transnational Climate Governance." In *Review of International Organizations* 9: 59–82.

Harstad, Bård. 2023. "Pledge-and-Review Bargaining." In *Journal of Economic Theory* 207: 105574.

Hathaway, Oona A. 2002. “Do Human Rights Treaties Make a Difference?” In *The Yale Law Journal* 111, no. 8: 1935–2042.

Hausfather, Zeke. 2020. “UNEP: Net Zero Pledges Provide an Opening to Close the Growing Emissions Gap.” https://www.carbonbrief.org/unep-net-zero-pledges-provide-an-opening-to-close-growing-emissions-gap.

Hermansen, Erlend A. T., et al. 2021. “Post-Paris Policy Relevance: Lessons from the IPCC SR15 Process.” In *Climatic Change* 169, no. 1: 1–18.

High Seas Task Force. 2006. *Closing the Net: Stopping Illegal Fishing on the High Seas.* Governments of Australia, Canada, Chile, Namibia, New Zealand, and the United Kingdom, WWF, IUCN, and the Earth Institute at Columbia University.

Holden, Lorraine. 2024. “From Farm to Fork? Brexit and the International Plant Protection Convention.” In *Environmental Law Review*.

Hurley, Alexander, and Tzu-Yang Lee. 2021. “Delayed Ratification in Environmental Regimes: Indonesia’s Ratification of the ASEAN Agreement on Transboundary Haze Pollution.” In *The Pacific Review* 34, no. 6: 1108–1137.

Intergovernmental Panel on Climate Change (IPCC). 2014. “Summary for Policymakers.” In *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, edited by Core Writing Team, Rajendra K. Pachauri, and Leo A. Meyer. Geneva: IPCC.

Intergovernmental Panel on Climate Change (IPCC). 2018. *Global Warming of 1.5°C. An IPCC Special Report on the Impacts of Global Warming of 1.5°C Above Pre-industrial Levels and Related Global Greenhouse Gas Emission Pathways, in the Context of Strengthening the Global Response to the Threat of Climate Change, Sustainable Development, and Efforts to Eradicate Poverty.* Edited by Valérie Masson-Delmotte et al. Geneva: IPCC.

Jaeger, Carlo C., and Julia Jaeger. 2011. “Three Views of Two Degrees.” In *Regional Environmental Change* 11, suppl. 1: S15–S26.

Johnston, Alastair Iain. 2001. “Treating International Institutions as Social Environments.” In *International Studies Quarterly* 45, no. 4: 487–515.

Joint Hearing with the House Foreign Affairs Committee and the Select Committee on the Climate Crisis. 2019. “Voices Leading the Next Generation on the Global Climate Crisis.” September 18. https://foreignaffairs.house.gov/2019/9/voices-leading-the-next-generation-on-the-global-climate-crisis.

Kelley, Judith G., and Beth A. Simmons. 2015. “Politics by Number: Indicators as Social Pressure in International Relations.” In *American Journal of Political Science* 59, no. 1: 55–70.

Kelley, Judith G., and Beth A. Simmons. 2019. “Introduction: The Power of Global Performance Indicators.” In *International Organization* 73: 491–510.

Keohane, Robert O. 1986. “Reciprocity in International Relations.” In *International Organization* 40, no. 1: 1–27.

Keohane, Robert O. 2005. *After Hegemony: Cooperation and Discord in the World Political Economy.* Princeton: Princeton University Press.

Keohane, Robert O., and David G. Victor. 2011. “The Regime Complex for Climate Change.” In *Perspectives on Politics* 9, no. 1: 7–23.

Krasner, Stephen D. 1982. “Structural Causes and Regime Consequences: Regimes as Intervening Variables.” In *International Organization* 36, no. 2: 185–205.

Levy, Marc A. 1991. “The Greening of the United Kingdom: An Assessment of Competing Explanations.” In *Annual Meeting of the American Political Science Association.* Washington, D.C.

Levy, Marc A. 1993. “European Acid Rain: The Power of Tote-Board Diplomacy.” In *Institutions for the Earth. Sources of Effective International Environmental Protection*, edited by Peter M. Haas, Robert O. Keohane, and Marc A. Levy, 75–100. Cambridge: MIT Press.

Levy, Marc A. 1995. “International Cooperation to Combat Acid Rain.” In *Green Globe Yearbook of International Co-operation on Environment and Development 1995*, edited by Helge Ole Bergesen, Georg Parmann, and Øystein B. Thommessen, 59–68. Oxford: Oxford University Press.

Lieberman, Evan S. 2005. “Nested Analysis as a Mixed-Method Strategy for Comparative Research.” In *American Political Science Review* 99, no. 3: 435–452.

Mahoney, James. 2010. “The New Methodology of Qualitative Research.” In *World Politics* 62, no. 1: 120–147.

McCulloch, Alastair. 1992. “The Green Party in England and Wales: Structure and Development: The Early Years.” In *Environmental Politics* 1, no. 3: 418–436.

Mitchell, Ronald B. 1994. “Regime Design Matters: Intentional Oil Pollution and Treaty Compliance.” In *International Organization* 48, no. 3: 425–458.

Mitchell, Ronald B. 1995. “Compliance with International Treaties: Lessons from Intentional Oil Pollution.” In *Environment: Science and Policy for Sustainable Development* 37, no. 4: 11–41.

Mitchell, Ronald B., et al. 2020. “What We Know (and Could Know) About International Environmental Agreements.” In *Global Environmental Politics* 20, no. 1: 103–121.

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

Moravcsik, Andrew. 1994. “Why the European Community Strengthens the State: Domestic Politics and International Cooperation.” In *Working Paper Series #52 Center for European Studies.* Cambridge: Harvard University.

Moravcsik, Andrew. 2000. “The Origins of Human Rights Regimes: Democratic Delegation in Postwar Europe.” In *International Organization* 54, no. 2: 217–252.

Munton, Don, Marvin Soroos, Elena Nikitina, and Marc A. Levy. 1999. “Acid Rain in Europe and North America.” In *The Effectiveness of International Environmental Regimes: Causal Connections and Behavioral Mechanisms*, edited by Oran R. Young, 75–101. Cambridge: MIT Press.

Oden, Svante. 1968. “The Acidification of Air and Precipitation and Its Consequences in the Natural Environment.” *Swedish National Science Research Council Ecology Committee Bulletin* 1.

Oppenheimer, Michael, and Annie Petsonk. 2005. “Article 2 of the UNFCCC: Historical Origins, Recent Interpretations.” In *Climatic Change* 73, no. 3: 195–226.

Oye, Kenneth A. 1985. “Explaining Cooperation Under Anarchy: Hypotheses and Strategies.” In *World Politics* 38, no. 1: 1–24.

Parson, Edward A. 2003. *Protecting the Ozone Layer: Science and Strategy.* Oxford: Oxford University Press.

Ramus, Catherine A., and Ivan Montiel. 2005. “When Are Corporate Environmental Policies a Form of Greenwashing?” In *Business and Society* 44, no. 4: 377–414.

Riahi, Keywan, et al. 2022. “Mitigation Pathways Compatible with Long-Term Goals.” In *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, edited by Priyadarshi R. Shukla et al. Cambridge: Cambridge University Press.

Robinson, Mike. 1992. *The Greening of British Party Politics.* Manchester: Manchester University Press.

Rohlfing, Ingo. 2008. “What You See and What You Get: Pitfalls and Principles of Nested Analysis in Comparative Research.” In *Comparative Political Studies* 42, no. 11: 1492–1514.

Schleussner, Carl-Friedrich, et al. 2016. “Science and Policy Characteristics of the Paris Agreement Temperature Goal.” In *Nature Climate Change* 6: 827–835.

Schrader, Gritta, and Jens-Georg Unger. 2003. “Plant Quarantine as a Measure Against Invasive Alien Species: The Framework of the International Plant Protection Convention and the Plant Health Regulations in the European Union.” In *Biological Invasions* 5: 357–374.

Sentian, Jackson, et al. 2019. “Long-Term Air Pollution Trend Analysis in Malaysia.” In *International Journal of Environmental Impacts* 2, no. 4: 309–324.

Sheiman, David A., David D. Doniger, and L. L. Dator. 1990. *A Who’s Who of American Ozone Depleters: A Guide to 3014 Factories Emitting Three Ozone-Depleting Chemicals.* Washington, D.C.: Natural Resources Defense Council.

Simmons, Beth A. 2000. “The Legalization of International Monetary Affairs.” In *International Organization* 54, no. 3: 573–602.

Simmons, Beth A. 2009. *Mobilizing for Human Rights: International Law in Domestic Politics.* Cambridge: Cambridge University Press.

Slaughter, Anne-Marie. 1995. “International Law in a World of Liberal States.” In *European Journal of International Law* 6, no. 3: 503–538.

Snyder, Jack, and Erica D. Borghard. 2011. “The Cost of Empty Threats: A Penny, Not a Pound.” In *American Political Science Review* 105, no. 3: 437–456.

State of the Global Climate 2023. 2024. Technical report. Geneva: World Meteorological Organization.

Susskind, Lawrence E., and Saleem H. Ali. 2014. *Environmental Diplomacy: Negotiating More Effective Global Agreements.* Oxford: Oxford University Press.

Thomas, Daniel. 2001. *The Helsinki Effect: International Norms, Human Rights, and the Demise of Communism.* Princeton: Princeton University Press.

Timperley, Jocelyn. 2019. “CORSIA: UN Plan to Offset Growth in Aviation Emissions After 2020.” https://www.carbonbrief.org/corsia-un-plan-to-offset-growth-in-aviation-emissions-after-2020/.

Tingley, Dustin H., and Barbara F. Walter. 2011. “Can Cheap Talk Deter? An Experimental Analysis.” In *Journal of Conflict Resolution* 55, no. 6: 996–1020.

United Nations Environment Programme. 2023. *Emission Gap Report 2023: Broken Record.* Nairobi: UNEP.

United Nations Framework Convention on Climate Change. 1992. *United Nations Framework Convention on Climate Change.* New York: United Nations.

United Nations Framework Convention on Climate Change. 2015. *Adoption of the Paris Agreement. Draft Decision -/CP.21, FCCC/CP/2015/L.9/Rev.1.* Bonn: UNFCCC.

United Nations Framework Convention on Climate Change. 2021. *Glasgow Climate Pact. Decision -/CP.26, Advance Unedited Version.* Bonn: UNFCCC.

United Nations Framework Convention on Climate Change. 2023. *Outcome of the First Global Stocktake. Draft Decision -/CMA.5.* Bonn: UNFCCC.

Urpelainen, Johannes. 2013. "A Model of Dynamic Climate Governance: Dream Big, Win Small." In *International Environmental Agreements* 13: 107–125.

Van Asselt, Harro. 2016. "The Role of Non-State Actors in Reviewing Ambition, Implementation, and Compliance Under the Paris Agreement." In *Climate Law* 6, no. 1-2: 91–108.

Victor, David G., Marcel Lumkowsky, and Astrid Dannenberg. 2022. "Determining the Credibility of Commitments in International Climate Policy." In *Nature Climate Change* 12, no. 9: 793–800.

Vijge, Marjanneke J., et al. 2020. "Governance Through Global Goals." In *Architectures of Earth System Governance: Institutional Complexity and Structural Transformation*, edited by Frank Biermann and Rakhyun E. Kim. Cambridge: Cambridge University Press.

Weber, Elke U. 2008. "Doing the Right Thing Willingly: Using the Insights from Behavioral Decision Research for Better Environmental Decisions." In *The Behavioral Foundations of Public Policy*, edited by Eldar Shafir, 380–397. Princeton: Princeton University Press.

Western, Luke M., Martin K. Vollmer, Paul B. Krummel, Karina E. Adcock, Molly Crotwell, Paul J. Fraser, Christina M. Harth, et al. 2023. "Global Increase of Ozone-Depleting Chlorofluorocarbons from 2010 to 2020." In *Nature Geoscience* 16, no. 4: 309–323.

Wettestad, Jørgen. 1997. "Acid Lessons? LRTAP Implementation and Effectiveness." In *Global Environmental Change* 7, no. 3: 235–255.

Wettestad, Jørgen. 1999. "Designing Effective Environmental Regimes: The Case of the Convention on Long-Range Transboundary Air Pollution (CLRTAP)." In *Energy and Environment* 10, no. 6: 671–703.

Willock, Anna, and Martin Lack. 2006. *Follow the Leader: Learning from Experience and Best Practice in Regional Fisheries Management Organizations.* Gland: WWF International and TRAFFIC International.

Worm, Boris, Ray Hilborn, Julia K. Baum, Trevor A. Branch, Jeremy S. Collie, Christopher Costello, Michael J. Fogarty, et al. 2009. "Rebuilding Global Fisheries." In *Science* 325, no. 5940: 578–595.

Young, Oran R. 2017. "Conceptualization: Goal Setting as a Strategy for Earth System Governance." In *Governing Through Goals: Sustainable Development Goals as Governance Innovation*, edited by Norichika Kanie and Frank Biermann, 31–52. Cambridge: MIT Press.

Young, Oran R. 2018. "Research Strategies to Assess the Effectiveness of International Environmental Regimes." In *Nature Sustainability* 1: 461–465.