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1

Introduction

TOWARD EXPERIMENTALIST GOVERNANCE

Can the world meet the challenge of climate change?

After more than three decades of global negotiations, the prognosis looks bleak. The most ambitious diplomatic efforts have focused on a series of virtually global agreements such as the Kyoto Protocol of 1997 and Paris Agreement of 2015. But with so many diverse interests across so many countries, it has been hard to get global agreement simply on the need for action, and *meaningful* consensus has been even more elusive. Uncertainty about which emissions reduction strategies work best has impeded more robust action; prudent negotiators have delayed making commitments and agreed only to treaties that continue business as usual by a more palatable name. All the while, emissions have risen by nearly two-thirds since 1990, and they keep climbing—except for the temporary drop when the global economy imploded under the coronavirus pandemic. Yet to stop the rise in global temperature, emissions must be cut deeply—essentially to zero over the long term.

Meanwhile, similar problems have plagued global governance more generally. The World Trade Organization (WTO), founded in 1995, has been paralyzed for more than a decade by the kind of consensus decision-making that has hamstrung climate diplomacy. In many other domains, from human rights to investment to monetary coordination, international order seems to be fraying. With no global hegemon and no trusted technocracy—welcome changes in the eyes of many—there is no global authority to mend it.

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Popular protest has only reinforced this global gridlock. The Great Recession of 2008 exposed the limits of the postwar model of economic growth, and the economic shock triggered by the pandemic has dramatically exacerbated social inequality. No wonder that climate change and economic policy have become even more densely intertwined politically. For conservatives in many countries, decarbonization is a fraught symbol of the global elite. Repudiating climate agreements—Donald Trump’s snubbing of the Paris Agreement, for example—has been seized on as a way to reassert the primacy of national interests after decades of unchecked globalism. For progressives, meanwhile, efforts to reconcile sustainability and inclusive well-being find expression in calls for massive public investments such as a Green New Deal. That vision has found tentative success in only a small fraction of the global economy—one that accounts for a shrinking slice of global emissions.

But bleak as it is, this record is not the whole story. Alongside the string of disappointing global agreements and false visions of surefire solutions are significant as well as promising successes in many other domains. We can learn from them in the fight to rein in warming. From the global to the local levels, and at every level in between, models of effective problem-solving have already emerged and continue to make progress on issues, like climate change, that are marked by a diffuse commitment to action, but no clear plan for how to proceed. These efforts work in countries as diverse as China, Brazil, and the United States, and for international problems as diverse as protecting the ozone layer and cutting marine pollution. They address challenges as intrusive and contentious as any that arise with deep decarbonization, and tackle challenges whose solutions require unseating powerful interests and transforming whole industries. In sector after sector, from steel to automobile transport to electric power, real progress in the elimination of emissions is gaining momentum.

The strategy underlying these initiatives points the way forward. They work by setting bold goals that mark the direction of the desired change. But they acknowledge up front the likelihood of false starts, given the fact that the best course of action is unknowable at the outset. They encourage ground-level initiative by creating incentives for actors with detailed knowledge of mitigation problems to innovate and then converting the solutions into standards for all. But they also enable ground-level participation in decision-making to ensure that general measures are accountably contextualized to local needs. When experiments succeed, they provide the information and practical examples needed to mold politics and investment differently—away from vested interests and toward clean development. They

solve global problems not principally with diplomacy but instead by creating new facts on the ground—new industries and interest groups that benefit from effective problem-solving, and that push for further policy effort.

We call this approach to climate change cooperation *experimentalist governance*. It is sharply at odds with most diplomatic efforts—including the important but ultimately flawed Paris Agreement—which so far have failed to make a meaningful dent in global warming. The architects of global climate treaties assumed that the dangers of climate were clear, and that solutions were in hand or easily discoverable. The real problem—in their understanding, often the only one—was the allocation of the costs of adjustment and the associated mobilization of political will. Since cutting emissions is expensive, and each nation is tempted to shirk its responsibilities and shift the costs to others, climate diplomats took it for granted that no nation would cooperate unless all are bound by the same commitments. The analogy was to a group of shepherds, aware that together they are overgrazing the commons they share, but each calculating that it is foolish to reduce their flocks unless all the others do. From those assumptions came the requirement that climate change agreements should be global in scope and legally binding. The result is global action no more ambitious than what the least ambitious party will allow.

These assumptions have not stood up to the test of time, and neither has the paradigm for solving the climate problem. Above all, the easy availability of solutions can't be taken for granted. The experience of recent decades with, for example, electric vehicles, integration of renewables in the power grid, and improvements in ground-level pollution control, shows the difficulties. While solutions can be achieved, they are hard to come by and require deep, coordinated changes in many domains. Progress depends on the degree to which innovation is encouraged and coordinated. From this perspective, the problem that the overgrazing shepherds face is not primarily to agree on sharing the burdens of adjustment but to make adjustment feasible by cooperating to develop a new breed of sheep that grazes on less grass—and perhaps new varieties of grass and pasture practices as well. If that metaphor captures the fundamental challenge of climate change, then the best way to build effective consensus is not to ask who will commit to certain predetermined outcomes no matter what but instead to begin by systematically encouraging solving problems at many scales and piecing the results together into ever-stronger solutions. Global commitments, achieved through diplomacy, should be the outcome of our efforts rather than the starting point.

This is a book about extraordinary but little-noticed innovations in organization and governance that take this alternative approach. We show

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how experimentalist strategies work under conditions of deep and pervasive uncertainty about the right solutions even when familiar approaches fail. We illustrate how they link local action with more encompassing coordination to speed the solution of general problems and, conversely, how they adapt general solutions to local contexts. We explain how public, private, and civil society actors, monitoring themselves and each other, can work together to advance decarbonization while making the economy more efficient and nimble. Along the way, we revisit enough of the history of climate change agreements to explain how the dominant institutions of the day all but foreclosed effective cooperation. Our central aim is to reorient our current climate change regime away from failed efforts based on *ex ante* global consensus, and toward a system anchored in local and sectoral experimentalism and learning. We firmly believe we can meet the stark challenges before us, and experimentalist governance shows us how.

A paradigm case of experimentalist governance and central example running through this book is the 1987 Montreal Protocol on Substances That Deplete the Ozone Layer—by many measures, the single most effective agreement on international environmental protection. We argue that we still have a lot to learn from Montreal as well as a lot to *unlearn* from mistaken views about the basis of its accomplishments. To set the stage for the rest of the book, we give a preview in the following section of the nuts and bolts of the protocol's exemplary successes. We then spell out the fundamental principles that made it work: the bedrock design ideas of experimentalism, which we will explore in more depth in later chapters. Next, we identify three flaws of traditional climate change policy thinking that impede more effective forms of action and go on to discuss how all of this relates to the signature piece of climate diplomacy today: the Paris Agreement of 2015. We end with the plan for the rest of the book.

The Montreal Protocol: An Exemplary Success

Crafted in the late 1980s, the Montreal Protocol was ahead of its time.¹ Not only was it highly effective, but it became a model for what might be achievable in solving the problem of climate change. Despite widespread admiration for the successes of Montreal, the real reasons for its achievements were largely misunderstood and misapplied in the case of climate change. Although the ozone and climate regimes looked quite similar on the surface, Montreal advanced quickly to solve the ozone problem while there was little problem-solving in the domain of climate change.

It is useful to go back in history to probe why Montreal worked—and how it became an exemplary system of experimentalist governance. That proper understanding is essential to knowing not just why the ozone layer is healing but also how to make more progress on climate change by creating an institutional architecture that takes uncertainty for granted—a system that is a spur to innovation rather than a cause of political gridlock.

Beginning in the 1970s, scientists detected chemical reactions thinning the atmospheric ozone layer that protects most life on earth from ultraviolet radiation. The cause was traced to the emissions of chlorofluorocarbons (and later other chemicals, including halons) that were then widely contained or used in the manufacture of many products, from aerosol sprays to fire extinguishers, styrofoam, refrigeration and industrial lubricants, and cleaning solvents. After more than a decade of contentious debate, two linked treaties, the Vienna Convention (1985) and Montreal Protocol (1987), created the framework for a global regime whose governance procedures were elaborated in the following years. The original black letter provisions in these agreements were thin on content; success came from how these institutions evolved through practice. Nobody used the term “experimentalist governance” to describe what they were doing, but experimentalism is the system that they created.

The core of this system of governance is a schedule to control and eventually eliminate nearly all ozone-depleting substances (ODS). The measures are reassessed every few years in light of current scientific, environmental, technical, and economic information, and the schedule is adapted as necessary. The periodic meeting of the parties has broad authority to review the implementation of the overall agreement, and make formal decisions to add controlled substances or adjust schedules.

In this regime, problem-solving is broken down into sectors that use similar technologies, and is guided by committees representing industry, academia, and government regulators. The committees organize working groups of ODS users and producers to review and assess efforts, mainly in industry, to find acceptable alternatives. The reviews consider key individual components as well as whole systems—for example, assessing whether a refrigerant that depletes the ozone layer can be replaced by an analogous and more benign alternative as well as whether refrigeration systems that utilize these new chemicals can work reliably and at an acceptable cost. Pilot projects yield promising leads that attract further experimentation at a larger scale, allowing the committees to judge if the nascent solution is robust enough for general use. Without the institutions of the Montreal

Protocol, what looks like the successful spontaneous search for alternative technologies would not have been possible.

If this search comes up short, the committees and their oversight bodies authorize exemptions for “essential” and “critical” uses, or extend timetables for phaseout. When the use of ODS was phased out in the metered dose inhalers that propel medication into the lungs of asthmatics, for instance, the sectoral committee consulted doctors, pharmaceutical companies, and device manufacturers country by country to determine substitutes along with transition schedules that met the safety and efficacy requirements of patients. When a few firms invented an array of alternative metered dose inhalers using benign propellants, the committees put the industry on notice that the old methods would be banned. Innovative firms had a strong incentive not to be left out, and persistent laggards faced exclusion from the market.

Over time, an amendment procedure allowed additions within the existing categories of coverage and also brought new categories of emissions under control. The boundaries around “sector” were adjusted as the properties of each class of ODS was understood and new sectors were implicated. Analysts often celebrate Montreal because it followed the science of ozone depletion, but that science at the time of Montreal’s adoption was indeterminate as to ozone safe solutions, and the real root of success was the Montreal orchestration of experimentation and learning about uncertain industrial futures.

Membership in the Montreal Protocol expanded sharply as well. Initially the protocol focused on industrialized countries, as they had the highest consumption of ODS and were most compelled politically to stop ozone thinning. But use increased rapidly among developing countries, and they were allowed to extend their compliance schedules so as to encourage their participation in the protocol. As a further incentive, essentially all the costs of compliance for developing countries were paid by the Multilateral Fund (MLF) financed by the rich countries—costs that included not just the new technologies but also the local administrative capacity needed to oversee the preparation and execution of comprehensive regulatory plans for phasing out the production and use of ozone-destroying chemicals sector by sector. Simply making new technology available would not have compelled the use of these benign alternatives; local contextualization was essential, and the fund helped build that capacity. Administratively, the fund is probably the best-managed funding mechanism in the history of international environmental governance. Politically, it helped transform the ozone problem from one with a guaranteed deadlock—since developing countries did not

want to bear all of these costs themselves—into one that was more practical politically.

The Montreal regime operates against the backdrop of vague but potentially draconian penalties for governments and firms that drag their feet. For the Western governments that initiated the regime, such as the United States, those penalties were electoral. (Those were the bygone days when the United States was a reliable leader on global environmental topics.) For the industrial firms that made the noxious substances, the penalties were about brand value and the license to operate. DuPont, the most visible of these firms and therefore the most vulnerable, broke ranks with the rest of the industry to demand a phaseout. (It helped that the alternatives might prove more profitable.) Once there was one innovator, it was too costly for others to lag behind. And in countries that actively undermine the Montreal Protocol—Russia at first, but others later on, including India and China—the penalties were threats such as trade sanctions that came from other powerful governments, mainly in the industrialized world, that wanted Montreal to work and also wanted to make sure their home industries would not be undercut by violators overseas.

Designing for Uncertainty

The features of the Montreal approach that make it a good model can be captured in a handful of design principles. Together they characterize a distinctive decision-making process that is well suited to domains, like climate change, marked by great complexity and uncertainty where the very nature of possible outcomes is unknowable in advance.

This approach starts with a thin consensus among an open group of founding participants motivated to act. The precise definition of problems, let alone the best way to respond to them, can't be anticipated at the outset, but there is enough agreement on how to get started. In the case of Montreal, that initial agreement took the form of an acknowledgment that ozone thinning was a problem that must be stopped, and a first step would require cutting in half the most widely used ODS by 1998. At the time there was no agreement on the magnitude of the risk, the feasibility of finding particular substitutes by certain dates, or even whether 50 percent cuts were the right goal. Consensus thickens with effort, however, and new knowledge demonstrates what is needed, and which actors are capable and trustworthy. Interests are mutable as actors come to anticipate an advantage in the destabilization of the status quo and more demanding regulation. Participation is open, in the sense that

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