

Research Articles

Following the Leaders? How to Restore Progress in Global Climate Governance

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Abstract

The Paris Agreement is in trouble. Here we assess the potential for climate leaders to bring the global climate regime back on track by developing a strategic understanding of followership. In other words, leaders need to know how to encourage other actors to follow them. We develop a typology of follower types—Enthusiasts, Pliables, Reluctants, and Hard Nuts—distinguished based on motivation and capacity. We identify the scope for a participation cascade based on the distribution of follower types. We argue that achieving a participation cascade may be more likely if leaders appreciate three insights from theories of collective action. First, break down the climate mitigation problem into smaller, more manageable challenges, such as sectoral approaches. Second, prioritize major emitters and areas with high mitigation potential and politically feasible action. Finally, emphasize benefits to potential followers. Together, the strategies can help reduce the number of Hard Nut cases by making the cost/benefit calculus more attractive to prospective followers.

Climate summits have become festivals at which leaders talk about leadership. But leadership doesn't matter without followership. And that's the problem in addressing the climate crisis. There aren't enough followers.

—David G. Victor (2019a)

The 2015 Paris Agreement reaffirmed the target of keeping global temperature averages from rising 2°C above preindustrial levels and established an aspirational goal of preventing a 1.5°C increase over the twenty-first century. Unfortunately, progress is falling short.¹

The United Nations Environment Programme (UNEP) annually produces a gap report, estimating the distance between country commitments and what is required to stay within the 1.5°C and 2°C targets. In 2018, UNEP estimated the 2°C gap to be between thirteen and sixteen gigatons of CO₂ equivalent. Existing commitments are about one-third of what is needed by 2030 to have a good chance of staying below a 2°C increase (UNEP 2018). While all parties knew

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1. This article focuses on mitigation, though both finance and adaptation efforts are other important functions that the climate regime needs to perform.

that Paris commitments were inadequate, many countries are not fully implementing them. Global emissions increased by 1.7 percent in 2018 and another estimated 0.6 percent in 2019. Emissions of key states rose, including the United States after years of decline (Hausfather 2019; International Energy Agency 2019). China's emissions also ticked up after previous declines inspired optimism that coal use had peaked (Urpelainen 2018). China may still meet its Paris commitments, but that may merely reflect weak goals. Countries vital for climate protection, such as the United States, Australia, and Brazil, have elected anti-environmentalist politicians, auguring ill for international cooperation.

Moreover, scientific assessments conclude the problem is as bad or worse than feared. The Intergovernmental Panel on Climate Change (IPCC) issued a special report on the narrow emissions pathways to 1.5°C (IPCC 2018, 177–178). With temperatures already more than 1°C above preindustrial levels, we may cross that 1.5°C threshold by 2034 (Matthews et al. 2018). A 3°C or 4°C increase by century's end is not inconceivable (Busby 2019). While the coronavirus outbreak temporarily reduced economic activity, greenhouse gas emissions may only decline slightly in 2020, suggesting major overhauls in energy systems are required (Ludden and Brady 2020).

To deal with the climate crisis, bold action by major emitters is necessary. This article unpacks the scope for renewed progress on climate change by exploring the relationship between leaders and followers. The first section surveys existing climate governance. The second reviews kinds of leadership and develops a typology of followership. The third develops the idea of a participation cascade and three principles for collective action. Considering that climate mitigation is a difficult collective action problem, we suggest that leadership can facilitate followership and realize a participation cascade, first, by disaggregating the problem (e.g., sectoral mitigation); second, by focusing on major emitters and areas with high mitigation potential; and third, by emphasizing benefits to potential followers. In so doing, climate leaders can help shift the cost/benefit calculus of prospective followers and reduce the number of recalcitrant states moveable primarily through coercion.

While informed by research, this piece is largely deductive with examples drawn from our decades of work.

Global Governance of Climate Change

Actors need to meet their mitigation commitments or persuade or incentivize others to do so. In hegemonic stability theory, a single dominant state steps forward to encourage and potentially coerce cooperation. However, after its decline, institutions it established might endure (Keohane 1984; Stein 1984). In the climate regime, there has not been sufficient time to instantiate progress or the virtuous circle intended by the Paris Agreement. As COP24 president Michal Kurtyka (2018) argued, “the Paris Agreement was a precious seed, but it has yet to grow into a strong tree.”

The United States, which played a leadership role during the Obama administration, repudiated the Paris Agreement in 2017 and will withdraw as soon as it is legally permissible—November 2020, just after the next presidential election. The US departure from a leadership position reflects oscillating partisan politics (Busby 2008, 2015; Falkner 2005; DeSombre 2011). In the US absence, some analysts have looked to China, given its emissions, technology production capacity, and overseas finance. However, China's emissions have risen, and it continues to finance coal-burning power plants at home and abroad (Inskip and Westerman 2019). The European Union, long a champion of climate action, is, alongside core members, such as France and Germany, another potential candidate (Karlsson et al. 2011; Oberthür and Groen 2017, 2018; Schreurs and Tiberghien 2007), though its internal coherence is in doubt with Brexit and amid increasing east-west divisions (Michaelowa 2017). Some analysts look to subnational and nonstate actors. Coalitions by state, local, and private actors such as the We Are Still In Coalition and America's Pledge may partially compensate for the lack of federal ambition in the United States (Chan et al. 2019; Hale 2016; Hsu et al. 2019).

Determining whether and how these efforts can succeed requires us to step back. As Victor (2019a) argues, there is no shortage of candidates for leadership, but the problem is one of insufficient followership. To better understand followership, we briefly review what makes climate change so challenging.

Climate change is perhaps the most difficult collective action problem because greenhouse gases are derived from fossil fuels, which are central to modern economies. While not all countries are equally responsible, emissions come from many countries, many sectors, and millions of private actors. Climate mitigation has properties of a pure public good (nonexcludability and nonrivalry), which means that it is bedeviled by threats of free riding. Countries are reluctant to take on costly commitments if they fear others will not (Barrett 2003, 2007; Sandler 2004). In other respects, the atmosphere resembles a global commons. It is difficult to exclude actors from degrading it, but there is rivalry: only so much greenhouse gas can be emitted without there being dangerous consequences. Commons problems suffer from overuse (Barrett 2003, 2007; Sandler 2004).

There are 195 countries, and climate mitigation requires cooperation of enough of them to avoid dangerous climate change (Milkoreit 2019). Moreover, unlike arms control, where states can credibly commit to reducing their nuclear arsenals under state control, emissions mitigation requires states to regulate millions of private actors (Oye 1985). The heterogeneous preferences of different states and actors means that this problem is a malign one for cooperation (Underdal 2002).

While the world collectively will benefit from addressing climate change, most benefits/avoided harms will accrue to future generations or those not old enough to vote. Some countries may place a greater premium on present-day benefits over future costs and therefore privilege carbon-intensive growth over

climate protection. That heterogeneity in valuation of the future undermines cooperation (Oye 1985).

Furthermore, the adjustment costs of climate mitigation will be high for fossil fuel-exporting countries and sectors. Given their political power, they have and will continue to fight against the clean energy transition (Breetz et al. 2018; Graaf and Verbruggen 2015). Meanwhile, the benefits of climate action are largely diffuse, creating an asymmetry of interests. Economic sectors like the coal industry will be highly motivated to oppose mitigation, while the general public has—until the emergence of Extinction Rebellion and Friday school strikes—been only modestly incentivized to mobilize (Wilson 1980).

International institutions are intended to overcome these barriers but, until the Paris Agreement, had made matters worse. The 1997 Kyoto Protocol was based on the premise of common but differentiated responsibilities. Rich countries were seen as responsible for the problem and had an obligation to reduce their emissions first. Inspired by the success of the ozone treaty, climate negotiators in Kyoto negotiated country emissions targets and reduction timetables for rich countries. Developing countries, which included China and India, were excluded from commitments. That quickly became untenable politically in the United States, where the lack of Chinese and Indian commitments was seen as imposing unacceptable competitiveness losses. With China's emissions surpassing the United States in 2006, it became imperative for any successor agreement to include all the major economies.

The Kyoto approach was abandoned (after/at the 2009 Copenhagen summit) because its structure—with commitments for some and not others—discouraged state participation and action (Barrett 2009). The 2015 Paris Agreement premise was all actors would make voluntary commitments. Paris appreciated the inherent weakness of enforcement mechanisms in international environmental policy. A top-down agreement negotiated by diplomats was unlikely to lead to policy change in the absence of domestic implementation. Thus a regime with countries coming forward with their own commitments, so-called nationally determined contributions (NDCs), might be more effective. The agreement would serve as a focal point, largely for states to create common expectations for what they intended to do (Urpelainen 2019). While the initial NDCs were inadequate, the hope was that progress and trust building would allow states to ratchet up ambition and shift the economic and political fortunes in favor of societal groups advantaged by the agreement, what Hale (2018) calls “catalytic cooperation.”

While enforcement was inherently weak, Paris hinged on states having to abide by similar sets of rules with respect to reporting on emissions, mitigation efforts, and finance (Busby 2016, 2019; Falkner 2016b). Trust between parties could only develop in sunlight, and exposure of (in)action could lead to naming and shaming those not meeting their commitments. The Paris rulebook negotiated in Poland in COP24 in 2018 was central to that task. The core issues were to what extent the regime would allow for “bifurcation” of standards between developed and developing countries, potentially allowing countries like China and India to

provide less rigorous data (Busby 2019). With the Paris rulebook largely finalized, attention has turned to increasing the NDCs' ambition. With the 2020 climate negotiations postponed due to the coronavirus, countries will likely revisit their initial NDCs in 2021 before the global stocktake in 2023, the first collective evaluation of progress.²

On Leaders and Followers

The field has a well-developed literature on leadership but a nascent understanding of followership. Underdal (1994, 178) defines leadership as “an asymmetrical relationship of influence in which one actor guides or directs the behavior of others toward a certain goal over a certain period of time.” Leadership entails “positive influence,” the pursuit of group goals or some sort of shared collective interest (Underdal 1992). A country that withdrew from a treaty, for example, without an interest in something better would exercise influence but not leadership, though distinguishing between the two is difficult in practice (Skodvin and Andresen 2006, 18). Much literature focuses on negotiations, but more important going forward is influencing national policy directions (Karlsson et al. 2011; Skodvin and Andresen 2006). We are largely in a moment of fostering compliance rather than regime formation (Chayes and Chayes 1995; Simmons 1998; Young 1991).

Leadership is a function of both will and capability. The United States under Donald Trump may still possess the capability but lacks the will. Other actors may have the will but insufficient capability.

Underdal (1992, 1994) identified different kinds of leadership: *unilateral*, *instrumental*, and *coercive*. Unilateral leadership is where a state or other actor does something that it hopes others will emulate. Instrumental action is where actors find means to pursue common ends through learning and insight. Coercive action is where an actor uses power resources to induce others to follow.

Andresen and Agrawala (2002) introduce a slightly different formulation including power-based, directional, intellectual, and instrumental leadership. *Power-based leadership* is derived from material capability to deploy threats and promises, whereas *directional leadership* is based on the power of example. *Intellectual leadership* is based on building new ideas and policy proposals, whereas *instrumental leadership* is based on translating new ideas into action through coalitions and networks (Urpelainen and Graaf 2018). Actors may blend kinds of leadership.

With respect to material or structural power, countries may possess instrumental capacity as military or economic powers. Most obviously, militarily powerful countries can threaten and try to extract concessions from weaker actors. Economic power itself may have different components, including the capacity to mobilize finance, market power, and the power to destroy (Strange 1998).

2. NDCs pledged in 2015 covered the period 2020–2025, with some states' commitments extending to 2030.

Wealthy countries, historically the largest producers of greenhouse gases, can use their resources to reduce their own emissions but also to underwrite the trajectories of others. While states, international organizations, and private companies have the most resources, individuals also have considerable personal wealth, such as former New York City mayor Michael Bloomberg, who pledged \$500 million in June 2019 to support coal phaseout in the United States (Friedman 2019).

Actors, by virtue of the size of their domestic markets, market share, or production capacity, can also shape market outcomes. For states, the ability to influence markets can come through procurement, regulation, industrial policy, subsidies, tax policy, and investment portfolios. This observation helps us understand China's ability to drive down solar panel prices through aggressive subsidies, which has facilitated solar's global deployment. States with large domestic markets can use their power coercively to deny access to their markets.

Private actors may derive influence from oligopolistic markets that provide them with large market share, supranormal profits, and the ability to set prices. Large firms with significant revenue may also exercise influence through supply chains by dictating procurement standards to suppliers. Investors can exercise leverage through investments, as we have seen with Norway's sovereign wealth fund and efforts by large institutional investors to divest from fossil fuels. Firms can also adopt internal policies to decarbonize. Private-sector actors can establish collective governance mechanisms like certification systems and even moratoriums on certain products, such as the soy and beef moratoriums Brazilian firms accepted in the mid-2000s to combat deforestation.

An actor may possess issue-specific "power to destroy" by virtue of resource endowment (such as forests) or its environmental footprint (given large population size) (Downie 1999; Urpelainen 2019). Their choices can be critical for effectiveness. If the actor cares less about climate mitigation than others, it can extract resources from those who care more.

In terms of *directional or unilateral* leadership, actors can lead by example and create international moral or political demands that increase domestic pressure in other countries. The European Union is often credited with leading by example (Schreurs and Tiberghien 2007; Skjærseth 2017). We have also seen this with Norway's efforts to scale up electric vehicles as well as Canada's and the United Kingdom's plans to phase out coal. Subnational governments can also set the direction, as California has done with mid-century clean energy targets, which other US states are copying (McKinley and Plumer 2019).

Actors may also provide directional leadership without being first-movers for emission reductions. Here influence is derived from persuasion and is available to small and weak actors (Underdal 1992, 6). Countries vulnerable to climate change have unique moral legitimacy to make claims on others. Here, low-lying island countries may be especially compelling given their climate vulnerability. Other actors may be able to use accountability politics to name and shame others (Keck and Sikkink 1998), a role played by those with limited structural power, such as NGOs, as well as more powerful actors like the European Commission

(Skjærseth 2017). By writing an encyclical in 2015, Pope Francis used the moral power of his leadership of the Roman Catholic Church to rally global support for climate action (Pope Francis 2015).

As for *intellectual* leadership, actors may have unique capabilities to come up with new ideas (Urpelainen and Graaf 2018). Here ideas could be technological ingenuity or proposals like divesting from fossil fuels, popularized by Bill McKibben and 350.org. Other ideas, such as tax-and-dividend, phasing out coal, and mid-century decarbonization targets, start out as ideas by norms entrepreneurs before being taken up in policy (Cheon and Urpelainen 2018; Green 2018). The European Union's Emissions Trading Scheme (and the role of the European Commission) is another, though its performance suggests that not all ideas work (Skjærseth and Wettestad 2010). Universities, government laboratories, and private-sector actors are often intellectual agents. Through research and development, they can develop, test, and commercialize new ideas, such as direct air capture or electric vehicles. Such leadership is not simply about developing new concepts but about reducing their costs and complexity so they can be deployed at scale.

In terms of *instrumental* or *entrepreneurial* approaches, these include new organizing efforts, coalitions, or alliances like the Powering Past Coal Alliance. Other efforts include Emanuel Macron's call for a front-runner alliance of high-ambition countries, the Towards Carbon Neutrality Coalition (Government of France 2017). We also observe the work of secretaries-general of the United Nations, both Ban Ki-Moon and António Guterres, who used their convening power to host climate summits. At the 2014 climate summit, a coalition of actors voluntarily signed on to the New York Declaration on Forests to address deforestation. In 2019, Guterres convened another climate summit to encourage states to raise the ambition of their NDCs. With the diffusion of power globally, there is also increased potential for North–South and South–South collaboration, such as India's nascent efforts to diffuse solar electricity through the International Solar Alliance.

Individuals, subnational governments, and private-sector actors have also formed alliances. Former California governor Jerry Brown encouraged alliances of ambition across borders, particularly between subnational governments, through the Under2 MOU coalition (Under2 Coalition 2017). Michael Bloomberg was instrumental in another effort to rally cities around the world, the C40 group (C40 2019). He was also active catalyzing the We Are Still In coalition. Among NGO-led efforts, the Climate Group is rallying multinational companies to use 100 percent renewable power through RE100 (Climate Group 2019). They also support EV100, an effort by companies to scale up electric vehicles (Climate Group 2017) (see Table 1 for examples of leadership types).

While material inducements can be part of leadership, leaders cannot simply impose their ideas. They need, as Victor argues, followers: "For analysts, attention needs to focus less on what leaders do and more on what I call followership—whether other firms and countries follow the leaders" (2019b). As Underdal (1992, 5) notes, "leadership without followers' would be a contradiction in terms." Demand for leadership is as important as its supply (1992, 2). As Stein (1984, 358)

Table 1
Varieties of Leadership

<i>Kind of Leadership</i>	<i>Examples</i>
Power based	
Financial power	United States, China, Norway, World Bank, Bloomberg
Market power	China solar panels, US domestic market, Walmart supply chain, government procurement
Power to destroy	China's emissions, Brazil on deforestation
Directional	Norway EV mandate United Kingdom, Canada Coal phaseout California clean energy target Low-lying island countries Pope Francis
Intellectual	Cap-and-dividend Divestment Direct air capture Electric vehicles
Instrumental	Powering Past Coal Alliance Towards Carbon Neutrality United Nations Secretary Generals UN Declaration on Forests International Solar Alliance Under 2 MOU C40 We Are Still In RE100 EV100

observed in the trade arena, "a hegemon cannot alone bring about an open trading order.... The hegemon must get others to agree to lower their tariffs as well."

Mechanisms for inducing followership roughly follow the logics of consequences and logics of appropriateness (March and Olsen 1998). Actors can be coerced/incentivized to follow. They can also be persuaded, based on learning

new information that alters their understanding of the interests or as a result of social pressure. However, followership is not solely a function of will but also capacity. Not all states are equally capable of following, either due to lack of resources or bureaucratic capacity (Chayes and Chayes 1995; Urpelainen 2019). Thus, if a country is important for climate protection and has yet to mitigate emissions, one has to evaluate whether it *will not* or *cannot*. For actors that cannot follow, remedies have to include capacity building and external resources.

Inspired by Sprinz and Vaahtoranta's (1994) typology of states' enthusiasm to address ozone, we distinguish between follower types based, first, on the degree of environmental mobilization (as reflected by representation in government) and, second, on state capacity to implement policy. States with high environmental mobilization and state capacity are *Enthusiasts*, where states will likely initiate action or embrace action initiated by others. States with neither mobilization nor capacity are *Hard Nuts*. States with mobilization but limited capacity are *Pliables*: they are willing but not able. States without mobilization but with capacity are *Reluctants*: able but not willing (Hovi et al. 2017). The mechanisms most likely to work with Pliables are capacity building and financial support. The mechanisms to transform Reluctants are primarily domestic political mobilization and/or material incentives/coercion. Hard Nuts require capacity building and either domestic political change or material incentives (see Figure 1 for typology and examples).

Collective Action and the Participation Cascade

Given insufficient progress on mitigation, how can leaders inspire followership? Scientists have indicated to have a chance of staying below the 2°C threshold for average temperature increase, we need more or less to decarbonize fully by 2050. That will require a global energy transition much faster than what we have experienced historically, where transitions have unfolded over forty to sixty years or more

		Capacity	
		High	Low
Mobilization	High	<i>Enthusiasts</i> (Denmark, Canada, Costa Rica)	<i>Pliables</i> (Ghana, Ethiopia)
	Low	<i>Reluctants</i> (United States under Trump, Brazil under Bolsonaro, Russia)	<i>Hard Nuts</i> (Saudi Arabia, Democratic Republic of the Congo)

Figure 1
Typology of Follower Types

(Edwards 2015; Smil 2016). In late 2018, Harvey estimated the annual rate of decarbonization required to avoid dangerous climate change to be 10 percent a year, while PriceWaterhouseCoopers (2019) estimated that the decrease in carbon intensity had only been -1.6 percent per year between 2000 and 2018. The essential problem is how to encourage participation by all the relevant parties as quickly as possible, when many countries are Reluctants or Hard Nuts.

One inspiration for thinking about rapid decarbonization is the innovation literature. That literature depicts a classic S-shaped curve charting the diffusion and take-up of new technologies/practices, with rapid take-up followed by a flattened curve as diffusion slows. Rogers (2003) differentiated between actors based on the speed of their take up, starting with innovators, then early adopters, early majority, late majority, and ending with laggards.

Recent studies have found faster rates of diffusion of technologies like cell phones and the internet, suggesting these processes could be accelerated. Practitioners have noted technologies with even faster exponential growth (Smart 2019), such as the rate of increase in Facebook use and Moore's law, which reflects the rate of change in enhanced computing power. In the energy space, Naam (2011) described a solar Moore's law as the price per kilowatt hour of solar electricity plummeted. On the production side, energy-related work has examined what processes facilitated those price declines in solar (Nemet 2006, Jamasb 2007). On the consumer side, studies have explored adoption of residential solar and electric vehicles, the role of different policies, such as rebates, and social factors, such as peer networks (Noll et al. 2014; Rai and Robinson 2015; Wolf et al. 2015). Most of this work focused on individuals' decisions or micro-level actors. Though important, the decarbonization process will not happen on the timetable required without government intervention and global collective action. Perhaps more relevant are macro-level policy commitments.

In the late 1990s, Finnemore and Sikkink developed the "norm life cycle," a stylized model for how norms entrepreneurs persuade, socialize, and institutionalize states to support a norm, leading to what they call a "norm cascade" (1998, 898). In the struggle for decarbonization, collective progress requires what we call a *participation cascade*, where a decarbonization practice, technology, or agreement emerges and then is quickly adopted by a critical mass of actors responsible for a significant share of emissions in a sector or issue space. A rough rule of thumb would be 80 percent adoption by relevant actors.

Finnemore and Sikkink's approach focuses on ideational mechanisms behind processes of diffusion. Other scholars emphasize both ideational convergence and mechanisms of material inducement to alter the benefits of policy adoption (Simmons and Elkins 2004). In the environmental space, Vogel (1995) wrote about the "California effect" and how exporter countries adopt the standards of major importers because they have to comply with those obligations. A study of the diffusion of environmental ministries emphasized the interaction between international forces (namely, the salience of environmental concerns) and characteristics of follower countries (namely, democratizing countries) (Aklin and Urpelainen 2014). In the energy technology space, studies have explored

how leading countries' regulations can reduce the costs of technology, making it more attractive for followers (Hale and Urpelainen 2015).

These studies are important, but the participation paradox is that the most enthusiastic actors may be responsible for a small sliver of global emissions. Important states are unlikely to embrace decarbonization, either because they do not want to, they cannot, or both. For example, the Powering Past Coal Alliance was launched in November 2017 by Canada and the United Kingdom to hasten the phaseout of coal burning in electricity. By December 2019, thirty-three nation-states had joined the effort, as had twenty-seven subnational governments and thirty-seven businesses (Power Past Coal Alliance 2019). Looking just at country members, the Alliance moved from its two co-founders—responsible for 2.6 percent of global CO₂ emissions—to states responsible for 10.4 percent of global CO₂ emissions, including countries like Germany.³

While this is impressive growth in two years, the question is whether states responsible for a larger percentage of emissions will join. Unless the initiative ultimately captures important states like China, the United States, India, and Japan, it will never get a critical mass of participation. How, then, can leaders induce Reluctant and Hard Nut followers to generate a participation cascade?

Here we focus on three principles for collective action derived from theory and our observations of why cooperation on mitigation has historically foundered: disaggregate the problem, focus on the relevant, and emphasize what's important to followers.

Disaggregate the Problem

If we take the undifferentiated climate problem, there are many Reluctants and Hard Nuts. However, it may be possible to elicit more favorable attitudes by decomposing the problem into more tractable ones where actors perceive their interests as more favorably affected by some decarbonization practice. That might transform a Reluctant state that has capacity into an Enthusiast, or it may shift a Hard Nut case to be Pliable. Here leaders can show the way by example, by providing support for capacity building to Pliables or, like the Powering Past Coal Alliance, forming new networks, with the principal aim of recruiting actors that matter.

This observation is informed by recent work on sectoral emissions mitigation. As Keohane and Victor (2011) noted, there is no hierarchical climate institution. Facets of the problem are being dealt with by different bodies. They recommended accepting that as a virtue (see also Busby 2010; Michonski and Levi 2010).

Sectoral policies may reduce the number of players necessary for collective action and may narrow the heterogeneity of interests between actors. It can be easier to build domestic political support in different contexts for sectoral policies, such as vehicle performance standards and renewable portfolio standards (Vogt-Schilb and Hallegatte 2017).

3. This draws from 2017 data reported by Our World in Data (Ritchie and Roser 2017).

Promising attempts include efforts to address refrigerants, forests, aviation, and shipping (Krishnan and Busby 2015). In 2016, countries finalized the Kigali Amendment to the Montreal Protocol, the 1980s treaty that has begun to repair the ozone hole. Through the amendment, nations established a timeline for phasing down hydrofluorocarbons (HFCs), superpolluting refrigerants used in vehicles, homes, and factories (Davenport 2016). For example, even as the Trump administration has been hostile to climate action, major manufacturers pressed for US ratification of Kigali (Chemical Watch 2019).

Efforts to address international aviation and shipping have moved forward at the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO), respectively, though much depends on implementation.⁴ The Group of Twenty (G20) has tackled phaseout of fossil fuel subsidies, though with limited results (Environment News Service 2013; Graaf and Westphal 2011). The 2014 New York Declaration on Forests sought to move private-sector supply chains toward zero deforestation. Parallel efforts on tropical deforestation have had mixed success through bilateral and multilateral partnerships, many led by Norway (United Nations 2014).

Not all sectoral efforts will succeed. In 2007, the World Resources Institute coded the likelihood of success of international sector-based approaches based on the degree of international exposure, the concentration of actors, the uniformity of processes, the role of government, and the ability to measure and attribute emissions. Sectors like buildings, agriculture, and forests, given fragmentation and the lack of uniformity of processes, were challenging, whereas sectors like aviation, aluminum, cement, and steel were more concentrated and uniform, which favored success (Bradley et al. 2007). Within different sectors, some actors are more relevant than others, which leads to our second observation.

Focus on the Relevant

If 190+ countries are required for climate mitigation, the problem looks intractable. However, a more limited number of polities are really relevant (Graaf and Westphal 2011). As seen in Appendix A (see: https://doi.org/10.1162/glep_a_00562), the top fifteen polities, treating the European Union as a unitary actor, were responsible for nearly three-fourths of global emissions in 2016, including emissions from land use (World Resources Institute 2019). Looking at emissions solely from fossil fuels and industry, China (28 percent) and the United States (15 percent) together were responsible for more than 40 percent of global emissions in 2018. The total is nearly 60 percent if we include the European Union (9 percent) and India (7 percent) (Global Carbon Project 2019). In particular sectors, such as forestry, some states are especially important. Between 2001 and 2014, Indonesia (39 percent) and Brazil (19 percent) were responsible for nearly 60 percent of emissions from forestry

4. A compromise on aviation emissions was reached in June 2018 at ICAO (Petsonk 2018). An agreement at the IMO on shipping emissions was reached in April 2018 (Hirtenstein and Hodges 2018).

(World Resources Institute 2019). There are countries with large populations with potential for larger emissions if they get richer, such as Nigeria, but it is not materially important whether small, developing countries pursue decarbonization.

While the number of relevant state actors is reduced, incentivizing private-sector actors to implement emissions mitigation remains a challenge. This creates a more complex negotiating environment, what Putnam called two-level games, where states simultaneously have to satisfy domestic audiences and reach an international agreement (1988). However, the focus on the relevant provides some additional intuition to reduce the number of actors.

It is also important to couple awareness of key states with the major sources of emissions by sector and greenhouse gas. The World Resources Institute generated a Sankey flowchart of emissions for 2016, which showed that nearly three-fourths of greenhouse gases come from carbon dioxide, 17.3 percent from methane, with nitrous oxide and HFCs generating the remainder (see Appendix B, https://doi.org/10.1162/glep_a_00562). Globally, electricity and heat was the largest sector, responsible for 30.4 percent of emissions, followed by transportation (15.9 percent), energy manufacturing and construction (12.4 percent), agriculture (11.8 percent), and other sectors (World Resources Institute 2020). Further disaggregation within sectors is possible. This static view does not capture dynamism within sectors. For example, transport emissions are growing rapidly, including both road and aviation emissions.

Some sectors have concentrated emissions. Iron and steel generated about 5 percent of global emissions in 2012. China is responsible for about half of global steel production, and consequently, a sectoral approach for steel would need to emphasize emissions reductions by China (and Chinese-financed overseas steel production) (World Steel Association 2019). Similarly, in forestry and land-use (which was responsible for nearly 8 percent of global emissions in 2012), Indonesia was responsible for more than half of global emissions in 2014, with Brazil, Tanzania, Zambia, Nigeria, and the Democratic Republic of the Congo together responsible for another 38 percent.⁵

Returning to the likely efficacy of sectoral approaches, another way to anticipate potential success is to enumerate whether certain follower types dominate. Sectors with many Hard Nuts (maybe forests) or many Reluctants (such as fossil fuel subsidies) might be hard to change, unless followers can be coerced or incentivized or environmentalists gain power. Sectors dominated by Enthusiasts should be easier (such as HFC phasedown in advanced industrialized countries). In sectors with many Pliables, efforts can succeed if technical assistance is offered (e.g., HFCs and electric vehicles in India).

One way to induce participation by Hard Nuts and Reluctants is through unilateral or club-based approaches that start with Enthusiasts. Clubs may induce

5. Since then, Indonesia's emissions have declined and Brazil's have increased, but both remain important (World Resources Institute 2019).

participation particularly when accompanied by side payments or conditional commitments. Clubs create selective benefits for members, such as easier market entry or access to technology, even as they generate wider public goods available to nonmembers. Clubs thus combine power-based and instrumental leadership. Reluctants and even Hard Nuts may relent if enough Enthusiasts band together, especially if one of the major actors participates (Falkner 2016a; Helland et al. 2018; Hovi et al. 2016, 2017; Nordhaus 2015; Samans 2018; Underdal et al. 2012; Victor 2011). That said, it is unclear how well such clubs can function without the United States or if clubs led by others can induce US participation (Sprinz et al. 2018).

Emphasize What's Important to Followers

For Reluctant followers, it may be difficult to leverage sufficient material power to incentivize or coerce actors to change course. Here persuading actors to reappraise their interests may be possible with new information or framing (Haas 1989). It may be possible to highlight other dimensions that attract them based on what is already important to them. As before, this may make a Reluctant follower become an Enthusiast, especially if leaders combine power-based material and intellectual leadership to encourage followers to take up new ideas.

Actors may resist taking on obligations simply to fulfill climate goals, but they may embrace certain policies when the solutions advance other societal goals. Analysts have touted the potential for climate policy to produce co-benefits for other issues, such as air pollution and economic development (IPCC 2007). However, that has the logic backward. A more successful strategy ought to emphasize core problems, such as air quality, that might produce co-benefits for climate (Busby and Shidore 2015). Developing countries often have a preference for progress on issues other than traditional “green” conservation issues. Instead, they place higher priority on “brown” issues that more directly deal with human health. That suggests focusing on issues, such as air pollution, that are more appealing to them and encouraging policies compatible with climate protection (Urpelainen 2019). Taken together, these strategies would help a putative climate leader legitimize its efforts by offering tangible value to followers, who would in turn become more committed to following the leader. Such legitimacy is essential where a climate leader is likely unable to coerce major emitters (Eckersley 2019).

Conclusions

How can we anticipate whether leadership efforts are likely to generate followership? On the leadership side, does the initiative include actors responsible for a large share of global emissions or a large share of a particular sector (*unilateral leadership capability*)? Do the leaders have material capability to finance emissions reductions by themselves or by others, use access to their markets to coerce/induce others to change emissions trajectories, or use their production and markets to drive down the costs of green technology (*material leadership capability*)? If not, does the actor

possess convening power, a record of coalition building, or special relationships with some countries based on language or colonial history (*instrumental leadership potential*)? If not, does the actor possess moral legitimacy by virtue of its position (job) or vulnerability to climate change (*unilateral normative leadership potential*)? Finally, does the actor have new ideas for how to address a problem (*intellectual leadership*)?

Actors that are a large source of emissions and have material capability to influence others (by virtue of finance, market access, or technological innovation) structurally should have the most leadership potential (Helland et al. 2018; Hovi et al. 2016, 5). This would include countries like China and the United States. Actors that possess none of these attributes should have the weakest claims. In between, countries that possess some attributes may have modest potential. For example, India, which lacks the financial resources and production capacity to scale up solar deployment at home and abroad, nonetheless has achieved some success in utility scale solar and is attempting to diffuse its model—with the help of France—through the International Solar Alliance.

For other middle powers that have modest emissions and some wealth, the question is whether they have the combined capability—material, unilateral, instrumental, and intellectual—to encourage actors with the power to destroy to change their behavior. Most actors and initiatives of high ambition—including mid-century decarbonization targets, efforts to phase out coal, or initiatives to scale up electric vehicles—have a limited share of global emissions and some market size and financial resources, but nothing compared to the United States or China. Most countries with large capacity to destroy have the ability to address their emissions but not the will.

There are efforts to reinvigorate global climate diplomacy, not least of which to encourage states to raise the ambition of NDCs. At the fall 2019 UN climate summit, Secretary-General Guterres hoped states would announce increased targets for climate ambition (Sengupta 2019). The major emitters, such as China, Australia, and the United States, did not, and it is unclear if Enthusiasts that deepened their commitments have much influence over major emitters.

With the United States unlikely to change as long as Donald Trump is president, the question turns to China, a country of contradictions. Its emissions have been rising, but its deployment of renewables have too. The country is pursuing an ambitious industrial strategy to control the EV battery market as it has solar panel production. China's emissions trajectory has sent mixed signals about its seriousness in curbing emissions, which are not slated to peak until 2030 under its NDC. Moreover, the country is financing new coal plants internationally under its Belt and Road Initiative. At the second Belt and Road Forum in 2019, China received negative attention for its environmentally damaging overseas investments, which Chinese president Xi Jinping pledged to green (Goh and Cadell 2019).

This raises a final point about the sensitivity of major powers to criticism on climate change. Can advocates influence the trajectory of China and the

United States? Can advocates use emergent geostrategic security and economic competition between them to encourage a race to the top? France has said it might use border tax adjustments on the United States for failure to adopt stringent climate protection, or at least not pursue new trade deals in their absence. Several US Democratic presidential candidates for the 2020 election also endorsed border tax adjustments. Thus far, the international strategy for dealing with the United States has been to collaborate internally with US states and localities.

A second Trump administration would make that necessary but insufficient and increase demands for a climate club with excludable benefits. In the absence of the United States, China received diplomatic plaudits for reaffirming its support for Paris. If China's emissions trajectory remains unchanged, advocates will need a new approach. A China seeking more global legitimacy might be more sensitive to critiques of its behavior at home and abroad. As the world waits to see whether the United States will again become an Enthusiast, the insights from our strategic examination provide clues for how advocates can get the climate regime on track.

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