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Cooperation and discord in global climate policy

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Effective mitigation of climate change will require deep international cooperation, which is much more difficult to organize than the shallow coordination observed so far. Assessing the prospects for effective joint action on climate change requires an understanding of both the structure of the climate change problem and national preferences for policy action. Preferences have become clearer in light of the United Nations Framework Convention on Climate Change Conference of the Parties in December 2015. Although deep cooperation remains elusive, many partial efforts could build confidence and lead to larger cuts in emissions. This strategy of decentralized policy coordination will not solve the climate problem, but it could lead incrementally to deeper cooperation.

Over the past three decades, scientific understanding of the climate problem has radically improved, and since the late 1980s there have been continuous diplomatic talks as well as numerous formal agreements on the topic. Central to the diplomatic process have been the 1992 United Nations Framework Convention on Climate Change (UNFCCC) and its Conference of the Parties (COP), which takes place annually. The COP generates many decisions and periodically adopts new accords, such as the 1997 Kyoto Protocol[1] and the recent agreements in Paris in December 2015[2]. Although there is much optimism about the new Paris accords, so far the UNFCCC has had little real impact on emissions[3,4]. There has been lots of 'climate talk' and little 'climate action'.

In other words, climate politics displays the 'organized hypocrisy' that characterizes so much of international relations[5]. To help explain the weakness of multilateral cooperation — and to identify strategies for making cooperation more effective — we turn to literature on international coordination and cooperation, largely from the discipline of political science, with contributions also from economists.

Climate change politics, as currently structured, is not conducive to much cooperation[5–10]. The structure of the problem — the patterns of interests and incentives for action or inaction facing states — is malign. Because the pollutants that cause climate change mix across national borders in the atmosphere and because the economic effects of controlling those emissions are felt throughout the global economy, actions to protect the climate inherently involve the provision of a global public good[6,11,12]. That is, a safe climate system is advantageous to everyone on the planet (to different degrees), but no party can be excluded from these benefits regardless of its own actions. Public goods are typically underprovided in the absence of a governing authority, because each actor has an incentive to free-ride — to gain a beneficial climate while failing to pay its share. The problem of free-riding is worsened by the fact that leaders of states think that cutting emissions will make energy more expensive, adversely affecting national economic competitiveness.

Global public goods are most easily provided when a single dominant country, or a small group, takes the lead[6,7,13]. In climate change, however, no such group can readily solve the problem. The two largest emitters — China (23%) and the United States (12%) — together account for only about one-third of world net emissions of warming gases[14]. Global public goods can emerge, as well, when a global governing authority is already in place. Yet no such authority exists, although the Paris process may, in time, yield one. Thus, by the underlying structure of the problem itself, most states have strong incentives to avoid costly unilateral action, to wait for others to act and to negotiate for self-interested advantages. Breaking this gridlock requires building international institutions that help to promote collaboration.

Collaboration is the most encompassing concept to describe joint international action to achieve mutual gains. Collaboration can take many forms along a continuum from coordination to cooperation. In situations of coordination, agreements are self-enforcing, that is, once an agreement has been made, the parties do not have incentives to defect from it. For instance, once everyone in the United States understands that Americans drive on the right-hand side of the road, no rational driver has an incentive to drive on the left, and vice versa for drivers in the United Kingdom. Cooperation, by contrast, is not self-enforcing. In the famous game of 'Prisoners' Dilemma', for instance, each player has an incentive to confess, implicating his partner in crime in return for a lighter sentence[7,11,15–17]. The deep coordination needed between states to provide public goods has a similar structure. We develop a simple framework, revolving around Table 1, which helps to explain the observed combination of persistent negotiations with disappointing outcomes in terms of real impacts on emissions that can stop global climate change. Put differently, Table 1 describes the political structure of efforts to collaborate to solve common problems such as global climate change. Making progress on solutions will require both understanding and manipulation of these political structures.

Structure

The two most important variables that affect prospects for collaboration are shown in Table 1. As shown in the columns, larger prospective joint gains generate incentives for joint action. The second variable concerns whether collaboration is self-enforcing. When agreements are not self-enforcing, coordination is insufficient because parties have incentives to defect in order to gain an advantage for themselves. Additional incentives such as penalties or rewards for good behavior are required to induce cooperation, so collaboration is more reliable when agreements are self-enforcing. However, agreements with the greatest potential for joint gains often cannot be structured in a self-enforcing way — thus creating for policy makers a tradeoff between greater potential gains and an increased likelihood of achieving at least some collaboration.

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Table 1 | Prospects for coordination and cooperation under four different conditions.

	Potential joint gains are high	Potential joint gains are low
Agreements are not self-enforcing (cooperation is required for collaboration)	Possible cooperation with high rewards, but with dangers of defection that rise with the depth of cooperation.	Little incentive to seek to cooperate, although shallowness of cooperation limits dangers of defection.
Agreements are self-enforcing (coordination is sufficient for collaboration)	Likely coordination, with limited but realizable gains, often leaving potential gains 'on the table'.	Easy coordination, limited by the low level of potential gains.

Although self-enforcing cooperation is more reliable, it may also be shallow.

The most important and interesting cases are in the left-hand column of Table 1, where the potential joint gains are high. In the upper-left quadrant are the crucial situations where there are large potential gains from cooperation but strong incentives for parties to shirk from doing their share. Deep mitigation of warming emissions is a good example. As the gains from joint action on this public good rise, so does the temptation to defect. Effective action on mitigation of climate change requires policies and institutions that reduce that temptation.

In this upper-left quadrant, cooperation can emerge, but does so typically as the result of participants devising institutions that create patterns of reciprocity. Engaged in repeated interactions in which payoffs grow over long periods of time, participants have incentives to continue to cooperate to induce their partners to do so as well. Much of the huge success with international trade cooperation follows this logic. Despite the immediate incentives for individual countries to violate trade agreements, the World Trade Organization (WTO) and other trade institutions have helped focus political leaders on the need to preserve the long-term benefits of an open global trading system. The WTO works largely because trade is essentially bilateral, facilitating the use of reciprocity: if one state violates its commitments, the victims of its action can be authorized to retaliate[12,13,18,19].

In the lower-left quadrant of Table 1, coordination is sufficient to achieve joint gains. Often, diplomats shift problems from the difficult cooperation box, in which incentives to defect are high, to the much easier coordination box, which has low incentives to defect. Over the 60 years of international diplomacy on trade, for example, international agreements began by focusing on the highest tariffs, the reduction of which was clearly in the self-interest of countries and thus self-enforcing. As confidence grew, it became feasible to construct the WTO, with binding rules, adjudication and enforcement mechanisms. The 1987 Montreal Protocol on Substances that Deplete the Ozone Layer began as a prime example of successful coordination, in which countries adopted national policies offering benefits to the United States and the European Union (EU) that exceeded the cost by a wide margin. Deeper cooperation followed later[11]. However, this strategy of shifting hard problems to an easier structure comes with risks if collaboration remains shallow, enabling the parties to capture only a portion of the potential gains that could, in principle, be available[20].

As noted above, collaboration can also emerge when a single participant or small group finds it worthwhile to bear the expense. Many alliances, for example, provide a public good of security for a set of countries. In the hegemonic variant, the biggest partner (the 'hegemon') pays most of the cost. In the club variant, a relatively small number of members share the cost. For decades, the North Atlantic Treaty Organization alliance and the US–Japan security alliance have operated in this way, sharing costs but with the United States paying the predominant share. This is essentially a situation of coordination in which incentives to defect are low. Such situations are quite stable but tend to be organized around the interests of the hegemon.

The right-hand column of Table 1 is somewhat less interesting, but parallel. The November 2014 US–China bilateral agreement on emissions and cooperative research exemplifies easy coordination (lower-right quadrant). The United States and China announced individual as well as joint efforts to address a global problem, limiting themselves to efforts that aligned with their self-interest and initially providing small joint gains. Many initiatives announced in Paris — such as those on innovation, protection of forests and regulation of potent short-lived climate pollutants — can also be seen as examples of relatively easy coordination. When such easy but shallow coordination is unsatisfactory to participants, they have incentives to press for deeper cooperation. Here, as elsewhere, cooperation derives not from harmony but from discovering areas of discord where additional collaboration — moving west and northwest on Table 1 — would provide additional gains[7]. Insofar as this logic applies, cooperation could arise from such coordination within small groups of countries, and other actors dissatisfied with the status quo. It seems clear, for instance, that the US–China accord of November 2014 was important in generating incentives for other countries to make meaningful pledges of action as part of the Paris process.

In the upper-right quadrant, cooperation is difficult and potential joint gains are low. Efforts to create an international cooperative regime for managing deep-sea mining are an example: as countries learned that such activities would be less profitable than originally imagined, efforts to generate cooperation on this heated topic faded away.

The situations in Table 1 are stylized, omitting an important feature of all negotiations: domestic politics. Attempts at international collaboration engage interest groups within countries that can favour (or oppose) it. One lesson from the highly successful accords on international trade is that successful multilateral institutions create interest groups that favour collaboration. Liberal trade institutions strengthen exporters. In turn, exporters pressure and work with sympathetic government agencies that also seek liberal policy reforms — an alliance that was on display, for example, when domestic political forces within China mobilized to favour that country joining the WTO[21]. In almost every major area of international collaboration, domestic interest groups play essential roles in this way — allowing early steps towards coordination to create stronger internal political forces that beget deeper cooperation[15,16,22]. For example, global financial institutions provide openings for banks to help shape regulatory rules[23]; and human rights institutions provide leverage for civil society groups seeking to improve domestic human rights performance[17,24]. This topic is ripe for further investigation in the study of climate change[25,26]. Under what conditions do domestic civil society groups working on climate change gain leverage from participation in international institutions, and could different institutions mobilize stronger interest groups within countries to favour international collaboration? Will the credibility of international accords, such as those adopted in Paris, help form political interest groups working across borders to strengthen national policies in ways that make deeper cooperation possible? Under what conditions might successful international collaboration also create backlashes that bedevil further efforts to deepen cooperation?

The distinction between shallow coordination and deep cooperation helps to explain why there has been massive diplomatic activity on climate change but little progress on the difficult task

of cutting emissions. The coordination–cooperation distinction also suggests how progress could be made on climate change. If the toughest problems are tackled first, deadlock is likely to result. Examples include the failed effort by governments to reach agreement on a meaningful new treaty at the Copenhagen conference in 2009 to replace the original Kyoto Protocol. Too many issues with too many fissures of disagreement were packaged into an accord that required too many countries to consent before it could become law[3,27–32]. It is crucial to move from shallow coordination towards deeper cooperation, while at the same time creating the conditions for favourable political coalitions within countries. Much of the enthusiasm around the larger role for 'bottom-up' cooperation on climate change, as was on display in Paris, is rooted in this idea of building cooperation by working on smaller, easier problems and in smaller groups where progress is feasible. Effective cooperation requires focusing on areas where agreement is feasible and then working with reciprocity-based strategies that are known to promote deeper collaboration over time[3,27–32].

Our analysis also has implications for the construction of appropriate climate policy institutions. Deep cooperation hinges on repeated interactions and on incentives for parties to make their contribution to the collective effort. Much research on international cooperation therefore focuses on the roles of institutions; that is, persistent and connected sets of formal and informal rules, coupled with related organizations. Institutions establish focal points for coordination, reduce uncertainty about the behaviour of other states, and reduce the costs of making and enforcing agreements. Properly constituted, they influence practices and discourses within states, helping government officials and interest groups favouring cooperation to exert more leverage over government policies and the behaviour of firms. Institutions also disproportionately reflect the preferences of powerful states, a reality that needs to be taken into account. Poorly constituted or badly functioning institutions may inhibit collaboration, as their rules and practices are difficult to alter. For instance, in the UNFCCC, disagreements dating back to the earliest days of that institution prevented it from developing any formal rules (other than consensus) for making even the most trivial decisions. Effective policies to promote cooperation on climate change mitigation will require appropriate institutions.

It should be noted that our analysis relies on what is often called a rational institutionalist approach to understanding multilateral institutions, which emphasizes the functions that institutions perform and how they affect incentives for major actors. Another important approach, known as constructivist, focuses on language, discourses and persuasion. Its insights are largely complementary to those of the rational institutionalist approach, and most analysts recognize that an emphasis on incentives should be accompanied by attention to discourse. Among the many contributions that this approach can offer is attention to how discourse and persuasion can affect the underlying interests of states and interest groups[33–37].

It is tempting to imagine that once general agreement has been reached on the nature of the climate change problem — for example, agreement that warming should be stopped at 1.5 or 2 °C, as was visibly codified in Paris — appropriate institutions will emerge and that optimal mitigation strategies discovered by economic analysis will somehow follow suit. One of the central insights from political science is that optimal institutions often don't emerge, even when there are large potential gains to be had. Rather, strategies are needed to create those institutions. We now turn to conditions for institutional development, looking first at the underlying preferences of governments and other essential players, and then at the strategies for building effective collaboration.

Preferences

Whether governments will agree to cooperate by investing in institutions depends on their preferences. The major countries vary in population, affluence, technology and vulnerability to climate impacts — factors that, among others, affect how much they are willing to pay to address global climate change. They also vary in their capacity to design and implement the policies that could alter emissions trajectories[25]. Such diversity in circumstances leads to huge variations in the preferences of countries.

Yet empirical research on national preferences has been plagued by the fact that governments often avoid making their real preferences clear. The combination of general promises about acting on climate change with an unwillingness to pay substantially to achieve nominal goals leads, as noted above, to organized hypocrisy.

The negotiating process that was established in preparation for the Paris COP may make it much easier to observe reliably what countries seek. This process is based on countries submitting pledges — 'intended nationally determined contributions' (INDCs) — specifying proposed policy measures, especially in the period up to 2030. The INDCs offer nearly complete coverage, as 184 countries had submitted an INDC by the time the Paris conference opened in November 2015. When governments formally join the Paris Agreement, they will have the opportunity to offer new pledges — known more simply as Nationally Determined Contributions[2].

As with an earlier system of 'national communications' under the UNFCCC, INDCs vary in the extent to which they contain misleading promises and politically motivated information[38]. So far, the aggregate contribution of the INDCs to keeping climate change to the 2 °C limit is small, with emissions continuing to rise to 2030 even if all intended measures are implemented[39,40]. Nonetheless, they are a first step in building a system that creates incentives to reveal more reliably their actual and proposed contributions to global emission cuts. Indeed, the mere existence of these pledges has prompted an array of non-governmental organizations and other analysts to assess their content, fill in the missing pieces and evaluate which of the pledged actions are plausible[4,39,41].

For political scientists, these pledges can reveal a lot about national preferences that, previously, were impossible to observe systematically. Research on this topic should begin with a system of categories based on what countries might be trying to achieve with their pledges. We offer a preliminary list of motivations for action in Box 1, which shows that countries are motivated by many different factors when they make national climate pledges.

Applying the categories in Box 1, we can see the great variation among countries in incentives to take climate action. China, the biggest emitter, follows the logic of points 2 and 3. Its INDC and underlying policies emphasize the overlap between national pollution control, energy security objectives and global emissions controls, and it is also aiming to build new export industries in clean energy. It shares the objective of building new export industries with the United States, as revealed in the November 2014 bilateral agreement. In addition, both countries have reputational incentives (point 5) to be perceived as global leaders, albeit not at an excessive cost. In their INDCs and other related policy statements, Brazil and Indonesia — the most forested nations on Earth — have emphasized national public goods (point 2) and side-payments (point 4). Some countries remain largely uninterested in collaboration unless it aligns perfectly with local interests. Saudi Arabia's seven-page INDC, submitted long after other countries had already issued their pledges, simply describes what Saudi Arabia is already planning, highlighting the country's vulnerability not just to climate change but also to curtailment of the sale of carbon-based fuels[42].

Only a small fraction of world emissions — perhaps one-quarter or less — comes from countries such as the members of the EU and plausibly the United States that are adopting policies mainly for the purpose of providing global public goods (point 1 in Box 1). This helps explain why making progress on climate change

Box 1 | The range of interests reflected in national pledges.

(1) **Create the global public good of reduced climate change.** It might be thought that most countries seek to contribute to a global public good. But only a small fraction of world emissions — perhaps one-quarter or less — comes from jurisdictions such as the EU and some regions in the United States (for example, California and the northeast) — that are primarily motivated by global public goods. For the rest, other logics drive preferences.

(2) **Create local or national public goods that happen to address, as well, the global public good of climate change.** An example is provided by measures to reduce emissions of soot, or black carbon, which both cause local health problems and contribute to global warming. One of the important advances in climate science over the past decade has been to understand how these 'co-benefits' are linked to global climate change[71]. However, most climate science has analysed these links by starting with policies aimed at slowing global warming and showing the local or national co-benefits. A political analysis would emphasize the local benefits, as these often drive policy decisions.

(3) **Generate competitive economic benefits, such as the creation of new industries — solar, wind, batteries.** Governments will be more interested in emission regulations at home and abroad insofar as they believe that they have competitive advantage, real or potential, in zero-carbon industries, such as solar and wind power. But they may, at the same time, persist in high-emissions activities, especially where vested interests — for instance, in coal power — are strong, so their search for economic benefits can be beneficial or harmful from the standpoint of mitigating climate change.

(4) **Bargain for side-payments, such as requests for money to help pay the cost of controlling emissions and adapting to climate change.** This motivation is likely to be especially strong for relatively poor developing countries, particularly those countries likely to bear significant costs as they prepare for and adapt to rising sea levels, more extreme weather and other effects of global climate change.

(5) **Create reputational benefits.** Governments have stakes in a wide variety of issues, and may find it advantageous to be seen as leaders in providing global public goods. According to J. S. Nye, doing so may enhance their 'soft power'[73]. For other states, as climate pledges become the norm, it could be important not to be stigmatized as a non-cooperator, which could hurt the state with respect to issues in which it has clear interests.

requires looking more broadly at other preferences, and why international cooperation on climate change has such complex motivations behind it. Nonetheless, most world emissions come from countries that favour at least some degree of action on climate change, for whatever reasons; so genuine cooperation is imaginable. That is, one could envisage a situation in which the world moved to the upper-left quadrant of Table 1. Furthermore, effective domestic political mobilization and transnational networking could move the preferences of some states further towards additional costly action.

Yet, as interests in serious action on climate change are not universally shared, and many laggard countries are resistant to domestic and transnational pressure, institutions such as the UNFCCC that require near-universal consensus are likely to make only modest progress. Even states that would conditionally be willing to do more are unlikely to offer ambitious policies, insofar as such policies would make sense for them only in the context of an ambitious agreement in which all major polluters participated. Such an agreement is not in prospect and bold demands for such a regime to be created are not credible. In the language used above, the current collection of INDCs reflects shallow coordination: not negligible, but not nearly ambitious enough to stop the build-up of warming gases in the atmosphere. Without new incentives for action, climate change collaboration is firmly stuck now in the lower-left quadrant of Table 1. What could be done to make more progress in ways that reflect the diversity in national preferences and capabilities?

Strategies towards deep cooperation

Given the political structure of the climate change problem and the preferences of governments, our next step in the analysis of the logic of international climate collaboration concerns the strategies that could lead beyond shallow coordination to deeper and more effective collective action. We can view these strategies as attempts to activate causal mechanisms that align with state preferences, reinforcing preferences for effective action, such as through the use of reciprocity[12,43], and transforming preferences over time so that countries and other political units favour deeper collaboration.

We now consider six strategies that have been tried in some form. We begin with those that are most comprehensive or intrusive and could therefore have the highest impact — but are difficult to implement — and move towards those at the other end of the impact–likelihood continuum.

- Universal agreements with legally binding targets and timetables (for example, Kyoto). Every state has to fit within the same framework, which ensures that the preferences of some states will not be closely met. As noted above, this strategy of ambitious cooperation falls into the top-left quadrant of Table 1, implying high potential rewards but correspondingly high dangers of defection. Accordingly, efforts to create successors to the Kyoto Protocol have either led to deadlock (Copenhagen) or very low levels of formal participation (Doha).
- Climate clubs. Such clubs would allow cooperation to emerge in small groups, gradually deepening and expanding to cover other countries, either excluding non-members from the benefits that they produce or forcing these non-members to pay for the benefits they receive[44–51]. Trade sanctions against non-participants are the obvious coercive means, but they are costly to impose. In seeking to solve cooperation problems by punishing defection, the club strategy therefore generates a different cooperation problem — how to induce participants to pay the costs of sanctions[52]. This cooperation problem may or may not be easier to resolve than the original problem of providing the public good of emissions control.
- Coordinated research to invent new technologies that create energy sources that are cheaper than high-carbon fossil fuels. The Montreal Protocol generated new technological changes, which sharply reduced the cost of change and made it easier to achieve progressively tougher targets[43,53]. Successful technological innovation would have enormous consequences on emissions[3,54], suggesting that an active effort to coordinate innovation policies on climate could alter the preference of countries for cooperation in the future[3]. How such a programme could be organized remains an area of future work.

- Pledge and review, as in the current Paris process. Each country makes a pledge to reduce emissions, which is reviewed by its peers or through some centralized process. Pledge and review is comprehensive, although one should expect coordination at only a relatively low level to result, unless the review mechanisms are highly effective and designed to engender deeper cooperation and links between countries as they tighten and refocus their pledges on areas of joint gain[55]. Such potentials have spawned literature on the importance of review mechanisms[56–58] as well as on the opportunities for joint gain by linking climate policies across borders[32,59,60]. Yet by giving scope to states to define their policy actions, pledge and review is politically easier to enact than either binding targets and timetables or a coercive climate club. Optimally, pledge and review would be coupled with a set of institutions designed to promote experimentation so that societies can learn what works. Such approaches require a diversity of experiments, periodic deliberation and penalties for parties that fail to make a contribution[53]. For example, palm oil producers have made substantial progress in cutting deforestation under the threat of losing access to the lucrative EU market for palm oil[61].
- Coordinated national actions with substantial benefits for the states taking action. The US–China agreement of November 2014, mentioned above, provides an example. Chinese climate efforts will include efforts to cut soot, which causes massive local harm to public health and is also a strong global warming agent. The problem, however, is that these actions are rational for governments to adopt anyway and thus, by themselves, may not engender further collaboration. Analytically, a central challenge in analysing pledges such as the INDCs is to assess the business as usual (BAU) level of emissions that would occur in the absence of policy and to credit or respond to efforts that cut emissions below BAU. In recent years, actual emissions have been tracking above BAU in most climate models[62], and in the analysis of the existing INDCs the uncertainties in country-level BAUs are probably larger than the actual cuts in emissions.
- Universal agreements on the basis of the lowest common denominator (for example, UNFCCC process agreements). Although feasible, such agreements for minimal coordination lead to few actions beyond what countries would have done anyway.

Strategies two to five probably hold out the most promise. No single negotiating process will deliver a desirable outcome; instead, a diversity of strategies will yield a patchwork of different, partially linked rules and organizations, which we call 'regime complexes'[48,63,64]. Instead of being focused on a single organization, they will be 'polycentric'[30,31,65]. The result could be a combination of climate clubs, coordinated research efforts, pledge and review with associated experimentalist processes, and coordination of national policies designed in part to deal with strictly national or local problems. For years, this complex and decentralized outcome has been seen as something to be feared, but our analysis of coordination and cooperation suggests that it could be essential. States should cooperate where cooperation is possible, often on the basis of voluntary groupings; coordinate on issues where cooperation is too difficult or where universal participation is desirable; and probe experimentally to seek to expand the boundaries of feasible cooperation. As no single path is likely to be globally effective on its own, a multiplicity of actions should be taken.

Furthermore, effective action on climate change must go beyond interstate cooperation. Much new work on the global climate change issues has documented increases in the number and scope of transnational networks; the growth of private authority, especially entrepreneurial private authority; a variety of initiatives in transnational climate change governance; and efforts to orchestrate these multifarious activities. To create new opportunities for climate cooperation, as well as to build domestic support, such transnational activity will be crucial[66–69].

Incremental change

Occasionally, world politics is characterized by disruptive change — change that creates new patterns of strategic interaction. For climate, the most plausible disruptions are probably those rooted in technology, such as new cost-effective methods for generating electricity with low or zero emissions. Already, the world has seen how quickly electricity production in the United States has changed as natural gas became cheaper than coal in some markets. Interest groups are emerging around new zero-emission technologies, such as renewables and nuclear. Strong interest groups may yet emerge, as well, for negative emission technologies, as they are vital to deep cuts in net global emissions; at present, however, those technologies are still immature and hypothetical[70].

Yet those who want effective action on climate change cannot count on technological innovation to appear autonomously and to solve climate problems. Serious international cooperation will have to emerge incrementally. The fundamental logic of global public goods makes it difficult for countries to create deep cooperation quickly. However, shallow coordination can create vital conditions for deeper cooperation, such as reliable systems for emissions accounting and reporting. And coordination can build confidence, lengthening the time horizons of the players and putting a greater collective focus on the joint gains from deeper cooperation. It can facilitate a dynamic of positive reciprocity, in which greater credibility and confidence facilitate further cooperation. Incremental progress towards cooperation can therefore occur.

But such progress requires those who seek effective action to understand the structures of the problems they are trying to solve and to seek to engage on relatively favourable terrain. Understanding the sources of state preferences — and how they change through persuasion and incentives — can inform more effective cooperation. Strategies based on real preferences, and appropriate incentives, work better than lecturing leaders on their scientific ignorance or simply hoping that good science will ensure that politicians will do the right thing.

Proceeding by small steps to build confidence and generate patterns of reciprocity is not a timid, second-best strategy. Instead, it is essential, because in world politics authority is divided, national preferences vary and there is pervasive suspicion that states seek self-interested gains at the expense of others. Rather than seeking to force policies and institutions into a single, integrated mould — a bold, grand bargain — supporters of effective climate policy must figure out how to operate effectively in a polycentric global system. Success is by no means guaranteed, but incremental policy change that takes polycentrism seriously is at least consistent with the political realities of world politics.

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Competing financial interests

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