Governing Global Problems under Uncertainty: Making Bottom-Up Climate Policy Work

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Abstract: With the failure of integrated, top-down bargaining strategies, analysts and diplomats have now turned to bottom-up methods such as "building blocks" and "climate clubs" to coordinate national climate change policies and to avoid persistent diplomatic deadlock. We agree that decomposition of the grand problem of climate change into smaller units is a crucial first step towards effective cooperation. But we argue that given the great uncertainty of the feasibility and costs of potential solutions, this bottom-up approach will only work if it is supported by institutions that promote joint exploration of possibilities by public and private actors along with the scaling up of successes. As politics precludes creating many of these institutions under the consensus-oriented decision rules of the UN system, engaged outsiders—including especially clubs or building blocks that can learn in the face of uncertainty—working in parallel with the UN diplomatic process will have to provide them.

The logic of global public goods demands global coordination to solve free-rider problems. The logic of tragedies of the global commons demands coordination to reconcile the interests of those who use it. But coordination can emerge in different ways. It can result from integrated, purposeful efforts to align the behaviors of key players—top down. Or it can emerge in a more decentralized fashion—bottom up—from a myriad of more localized and focused efforts at problem solving, some of which prove effective and diffuse widely. Some can be applied, as well, to effective problem solving in adjacent areas.

The top-down world has long been assumed as the first best strategy for solving serious global problems. It takes for granted which players should be at the table and that those players know their interests and capabilities. When the US and the Soviet Union set out to cap the volcano of strategic armaments they didn't rely on lots of decentralized actors to figure out what might work. Instead, these governments represented at the highest levels sat down and bargained directly. The result was integrated, top-down treaties focused on aligning interests where that was possible and enforcing key obligations where that was necessary. Similarly, the keystones in international economic coordination all emerged from

top-down bargains—most famously at Bretton Woods where the key actors literally sat around a table and crafted major economic institutions.[1] Since then, most trade negotiations have followed that same model—with each "round" of talks beginning with an agenda and each member of the talks agreeing, ultimately, to a single, integrated "undertaking." The assumption that top down is best pervades the diplomatic community, as reflected in the many grand efforts to reach global bargains in trade, human rights, and the environment.

While prized as the best way to solve global coordination problems—because it is strategic, comprehensive and integrated—top down is very demanding. It can only succeed if the key actors know, *ex ante*, where the system should be headed and how best to get there—which in turn requires that they understand their interests and can agree on some distribution of costs and benefits that reconcile them. Where critical information is lacking or the complexity of deal making is overwhelming, essential players may be unwilling or unable to coordinate their behavior. Thus bottom-up strategies have long been a fallback position in international cooperation. When the US and Soviet Union could not agree top down to stop atmospheric nuclear testing, a fallback, tacit bargain to stop that behavior emerged: the Soviets and then the Americans just stopped the practice for a time.

Most diplomats seem to treat strategic bargaining with a common, integrated purpose as Plan A. Failing that, a distant plan B envisions that countries and other key players cobble together what they can, where they can, and make progress. In this paper, we argue that conceptually the ranking of plans depends on the context. Integrated bargaining makes sense in settings where uncertainty is low—*ex ante* knowledge of means, ends and preferences is reasonably complete—and bargaining costs are correspondingly low. Where uncertainty is high, and actors, unsure of what outcomes are possible, are unable to specify reliably their own interest nor understand with precision the interests of others, experimentation and learning are better means of advancing (Axelrod 1984; Camerer 2003; Victor 2009; Ostrom 2009; De Búrca et al. 2014).

This same debate has unfolded in climate change over the last 25 years. Plan A strives for a strategic, integrated, legally binding agreement focused on the problem of global warming. This approach treats the United Nations as having a monopoly on legitimacy—and relying on the UN-sponsored Framework Convention on Climate Change (UNFCCC) as the exclusive venue for diplomacy. Diplomats have invested massively in Plan A, and many theorists have gone along for the ride—increasingly to demonstrate why the misalignment of incentives has led to diplomatic efforts that are bound to fail (Barrett 2006). A

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[1] But see Helleiner (2014) on the contribution of local experiences in the US and various Latin American countries to the final outcome at Bretton Woods.

similar focus on integrated solutions has emerged conceptually from the broad fields of "earth system science" and "sustainability science", which have have emphasized how diverse environmental and social problems are all interlinked—leading to the need for policy strategies that engage the whole planetary community. Rooted in the logics of global public goods, tragedies of the commons, and global interconnectedness of systems, there has been massive default support for policy strategies that emphasize global solutions to global problems.

For many years, the faults of Plan A have been surfacing—most strikingly in 2009 at Copenhagen, when countries even failed to accept formally a plan for further negotiations. Plan B, a bottom-up strategy, has since emerged to fill the resulting vacuum. In late 2015 in Paris this new bottom-up mode of diplomacy will be on full display as governments adopt a broad umbrella agreement under which a plurality of sub-universal and unilateral initiatives are slotted.

The theme of this special issue—building blocks—fits squarely into the growing enthusiasm for bottom-up approaches. Whether the emphasis is on generic "building blocks" (Falkner et al. 2010; Oppenheimer et al. 2013), clubs of countries (Potoski and Prakash 2005; Potoski and Prakash 2009; Carbone et al. 2009; Hoffmann 2011; Urpelainen 2013; Hovi et al. 2014; Victor 2015), decentralized policy efforts launched within national governments (Rabe 2008) or particular pollutants, such as soot (Wallack and Ramanathan 2009; Burney et al. 2013; Schmale et al. 2014), the animating idea is fundamentally the same: self-reinforcing cooperation can emerge within small groups of self-interested actors and, under favorable conditions, spill over into more encompassing problem solving. A complementary literature on "polyarchy" and "regime complexes" in climate change suggests how these many sub-universal efforts—from clubs of countries to domain-specific regulation—can produce a decentralized regulatory system (Ostrom 2009; Keohane and Victor 2011; Abbott et al. 2013; Cole 2015).

We caution, however, that building blocks and its many variants yield successful collaboration, let alone broad spillovers, only under highly restrictive circumstances. Decomposition of the climate problem into more digestible units does not, itself, assure that broader and deeper cooperation will emerge. In the extreme, decomposition might simply offer a political cover for governments to evade action altogether—leading to emissions of warming gases that are no different from "business as usual." Decomposition might, as well, lead to an expensive regulatory chaos if the many decentralized units fail to coordinate.

We argue that the insights of experimental governance (XG) indicate how decomposition can realize the goals of a building-block strategy for managing global public goods. Originally developed for understanding regulation and the provision of complex public goods, such as education, under uncertainty in the US and the European Union (Sabel and Zeitlin 2008; Sabel and Simon 2011;

Sabel and Zeitlin 2012a), XG has similar potential applications at the global level (De Búrca et al. 2014). Applied to climate change, XG points to the institutions—in particular, the need for reliable review and assessment of the decentralized attempts to solve practical mitigation challenges—needed to make the building blocks strategy effective. At the same time attention to the differences between the EU setting—where XG is thriving—and global institutions underscores the background requirements for XG to work in the context of global governance. Chief among these is the need to credibly sanction persistently uncooperative actors. We offer strategies for achieving these institutional requirements and are under no illusion about the difficulty of the tasks.

We develop the argument in three steps. First, we outline the logic of XG. Second, using the example of the Montreal Protocol agreements on the ozone layer, we show that the real world of environmental governance is already much more experimentalist than widely known. Third we apply that logic to climate change—with an eye to what might be done on the way to and after the Paris agreement to make a bottom-up strategy not simply plan B but a more effective, central strategy for managing the emissions that cause climate warming.

THE LOGIC OF EXPERIMENTALIST GOVERNANCE

Climate change is marked by two, intertwined sets of characteristics that make integrated, top-down bargaining all but impossible. The first set is political: the fragmentation of power and authority in the international system, and the corresponding absence of a hegemon to impose order on actors with sharply divergent interests. The second is cognitive: uncertainty about the feasibility of achieving policy outcomes, such as lower emissions, at acceptable costs. This uncertainty explains the inability of any country or firm that takes deep decarbonization of emissions seriously to identify *ex ante* what behavioral, technological and regulatory commitments will actually prove most effective. This shroud of uncertainty about the actual burdens of various commitments exacerbates the bargaining problems; the bargaining problems in turn heighten the sense of uncertainty as key parties cannot anticipate—and must fear—how counterparts will react to the frustration of expectations (Young 1989a; Young 1989b). If it is unknown at the time of bargaining which commitments really can be fulfilled and how others will respond if some are not, bargaining among parties with sharply different interests will be highly complex and cautious to the point of paralysis. Risk-averse players will prefer deadlock to codifying ambitions that may prove too costly or simply unattainable (Abbott and Snidal 2000; Hafner-Burton et al. 2012).

Decomposition *can* help break this vicious circle. An active strategy is needed to decompose the global problem into "natural" component problem areas—reducing the deforestation associated with increased cultivation of palm oil, soy,

or sugar, or the emission of greenhouse gases (GHG) produced by combustion in vehicles of electric power generation—that governments, firms and NGOs actually have begun to understand. In practice, this could mean focusing on sectoral and regional governance arrangements that encourage disciplined, inclusive problem solving by competent actors.

XG shows how actors facing uncertainty can jointly explore practical ways to realize their goals. And through this iterative process the underlying interests and preferences of the actors shift—toward more cooperation—while goals are adjusted in light of evidence about what is feasible (Sabel and Zeitlin 2012b). XG emphasizes that regulator and regulated, alike, rarely know what is feasible when they begin to tackle a problem under uncertainty; it prizes a diversity of efforts rather than monopoly. It identifies and continuously improves upon solutions that work—and pushes them to scale—while siphoning resources away from those that don't.

This approach to problem solving arises when there is a thin consensus among actors regarding an urgent problem: no sharp disagreement over fundamentals (that this particular problem exists, and is urgent), but no capacity to formulate a comprehensive and detailed plan of attack, to say nothing of monitoring it. In other words, the actors recognize a problem, but also that it is so fraught with uncertainty that familiar problem-solving strategies cannot be applied to it. Collaborative exploration is therefore preferable to inaction. In addition, there must be civil society actors—firms and their trade associations, NGOs of various kinds—as well as regional or municipal public officials with "local" knowledge of the problem and at least inchoate ideas about solutions or where to look for them—actors, in other words, with practical knowledge of the problem based on continuing, immediate experience; knowledge not yet captured in consolidated theory or reflected in prices.

Even the thinnest consensus on problem definition suffices for articulation of an initial, provisional goal—at the limit, the aim can simply be to make significant progress on solving the problem; agreement is all the easier to secure because the actors know that the feasibility of the target is subject to careful review in which they will have a part. In the next step various groups of ground-level actors are given responsibility for achieving the goal. They are authorized to search for and develop solutions as their experience suggests, but on condition that they report results to the convening authority. The results are then compared through various forms of peer review so successes can be quickly identified and if possible generalized, failures rejected early on and faltering efforts corrected in view of the advances of more promising ones. Where experience warrants, the goals themselves are revised—targets tightened, relaxed, or extended to new domains—and the revised goals are the starting point for the next round of local exploration.

How can a process such as this gain traction if there are veto players that might not, on their own, want successful solutions to emerge? And why won't XG simply lead to a chaos of decentralized efforts and partial solutions that could be worse than no effort at all? The logic of XG offers answers to these questions on two fronts.

One front concerns the costs of inaction. The engine that drives XG is not a starry-eyed assumption that actors want solutions. Instead, XG relies on a "penalty default" that can induce cooperation where it is not spontaneously forthcoming.

In the context of cooperative regimes, including the clubs and building blocks now emerging in the area of climate change, a penalty default is a draconian sanction—exclusion from a valued market or denial of an indispensible permit or license—imposed for persistent violation of the regime's norms. In effect the existence of a penalty default forces the actors to choose between refusing to cooperate at the risk of losing control of their joint fate or cooperating to determine their fate jointly. Under uncertainty, where outcomes are in large measure unknown, joint determination means not just bargaining to mutually agreeable terms, but the pooling of available information and joint exploration of new possibilities. With joint exploration comes the possibility of the re-definition of interests: deliberation. Penalty defaults are thus at one and the same time information forcing and deliberation enhancing.[2]

Analytically we can distinguish three sources for penalty defaults. First, they can be imposed by normative pressure, typically when firms react to the moral concerns of their customers. While consumers will often pay only an insignificant premium for "ethically" produced goods, they will often turn away from firms caught flagrantly violating environmental or labor norms. International brands with reputations for respecting such norms are particularly vulnerable to and careful to avoid such reactions.

Second, penalty defaults can be imposed hierarchically, by law. Under the Clean Water Act, for example, development surrounding a body of water must stop if the inflow of pollutants exceeds a total maximum daily load. Development can only proceed if affected parties establish a mitigation plan acceptable to the regulator. The ground-level actors elaborate the actual solution, but are induced to do so only by concern that they will lose their autonomy if they do not.

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[2] For the origins of the penalty-default concept in contract law see Ayres and Gertner (1989); for the difference between the penalty default and the related idea of bargaining in the shadow of hierarchy see Sabel and Zeitlin (2012a).

Third, and closely related, is the ability of powerful actors to impose penalty defaults on weaker actors. Large wholesalers or retailers, for example, can impose their requirements contractually on global supply chains—a practice that is ubiquitous in high value consumer goods and spreading to food and other areas. Often a country or other jurisdiction will use its public regulatory authority in combination with power asymmetries to set standards for outsiders. The US protected dolphins (ensnared as the by-catch of tuna fishing the eastern tropical Pacific) under the Marine Mammal Protection Act, initially by requiring countries exporting to the US to adopt the same protective measures used by the US fleet (Parker 1999). California has used its regulatory authority to set stringent standards—corrigible in light of progress in implementation (Reed, Jr. 1997)—for emissions for vehicles sold in the state. These standards now directly apply to one-quarter of all the vehicle miles travelled in the U.S.—the "California effect." There is an analogous "Brussels effect" as the EU increasingly imposes environmental conditions on the production of imports, with the explicit provision that foreign producers may meet the requirements by means adapted to their particular circumstances (Scott 2014; Scott 2015, forthcoming). The EU also provides technical and capacity building support to help countries and companies meet its standards (Lavenex 2014).

On the other front, XG helps explain why decomposition can lead not just to action but to integrated solutions over time. This second front is important because the "building blocks" and "clubs" literatures related to climate change tends to emphasize decomposition but not the need for reintegration.

To see the integrative potential of XG, note first that it isn't a purely "bottom up" strategy. Our approach to climate change is bottom up compared to the current top-down regime; but XG is actually a blend of the two. In XG higher-level or more comprehensive understanding is corrected in light of local experience and vice versa. XG regimes therefore require an institutionalized center, even if its role is facilitative—organizing the discovery, pooling and evaluation of information—rather than directive.

The requirement to articulate reasons for decisions across levels makes it necessary, moreover, to articulate assumptions that would otherwise remain unspoken in the background; so XG, unlike Elinor Ostrom's work on governing the commons (Ostrom 1990; Keohane and Ostrom 1995) and many other institutional arrangements that rely on local knowledge, does not operate tacitly. Instead, it actively fosters explicit learning. Invoking the philosophy of American pragmatism, we call this form of governance experimentalist precisely to underscore the way it uses the impact of problems to reveal shortcomings of habits and routines and to prompt exploration of alternatives.

Individually and together these features, especially against the backdrop of penalty defaults, increase the dynamic capacity of XG regimes to extend their

scope. Organized centers, adept at superintending joint exploration, develop economies of scope: the more they move from domain to domain, as new problems appear, the easier it becomes to move yet further afield. Reason-giving requirements produce explicit learning, some generalizable. A growing stock of generalizable knowledge and flexible, institutionalized capacity for practical problem solving lower the cost of policy action even in the face of increasingly difficult problems—reducing the risk of defection as coordination becomes more demanding.

Thus while XG stresses decentralized decision making and evaluation of costs and benefits as in the clubs and building blocks literature, it differs from these in three ways. The first concerns the nature of the relevant incentives. Clubs form when private actors conclude that provision of some good has benefits to each in excess of costs (Potoski and Prakash 2005; Potoski and Prakash 2009). XG stresses, in contrast, that actors often "volunteer" to participate in joint activities only when faced with the threat of draconian penalty defaults, such as exclusion from a valued market.

Second, where the theory of clubs presumes that the nature and benefits of club goods are self-evident—firms that choose to abate can in principle adhere to a code specifying how to do so, and their choice is motivated by the known returns to adhesion—actors in XG face uncertainty regarding both: XG organizes joint exploration of how to abate; this exploration yields information about possibilities, including especially costs, unknowable ex ante; and these findings can reshape calculations of interest.

Third, the institutional endowment of XG regimes offers an explicit theory for how cooperation that might begin in small groups focused on decomposed problems will spill over to wider and deeper cooperation as new information makes regulatory action easier and the benefits more apparent. Most of the building blocks and clubs literature has not offered a dynamic theory to explain how "bottom up" cooperation does not get stuck at the bottom.

In the next section we look at a particularly successful and expansive XG regime that serves as a prototype of the category.

AN EXAMPLE: THE MONTREAL PROTOCOL

In a larger project from which this essay is drawn we have looked at an array of iconic cases of international cooperation and regulation. In all these cases it has been assumed widely that solutions emerged by centralizing authority around powerful regulators. Perhaps the most important of these prior examples is the Montreal Protocol on Substantives that Deplete the Ozone Layer—perhaps the

most highly effective global environmental treaty and widely seen as a model for the top-down strategy reflected in the UNFCCC and the Kyoto Protocol.

The earliest targets adopted in Montreal largely codified what countries were already planning or could reliably implement. Most CFCs were cut in half. For the US, where a ban on many CFCs had already mobilized regulators, this was easy to deliver. For most of Europe and Japan, where no ban was in place, reductions were easily achieved once the US experience had shown what was feasible (Benedick 1991).

But for Montreal to go beyond this first step the institution needed a) to ratchet down existing commitments at a rate that countries would tolerate; b) to identify new reduction targets, especially for the most offensive chemicals in the atmosphere; and c) to address developing countries' concerns about the costs of abatement.

The institution solved these problems by marshaling ground-level technical expertise. To set reductions feasible for countries and key firms, governments quickly created "essential use" exemptions and established Technical Options Committees (TOCS) in sectors such as solvents, refrigerants and halon fire extinguishing agents. The TOCS determine the availability of substitutes or the capacity to develop them. They operate through working groups of users and producers to evaluate alternative ODS-free processes, examine improved logistics, and pilot projects involving new substances. The essential use exemptions assured there was a safety valve if alternatives didn't appear quickly enough as reductions became prohibitions.

Developments with metered dose inhalers (MDIs)—a drug delivery device that initially relied on ozone-depleting chemicals as the propellant—illustrate this process. Exemptions for MDIs were set for each country selling the devices and reviewed annually by technical experts (some from industry, others independent) to determine whether alternative MDIs could adequately deliver each of the drugs concerned. Once 2 or 3 alternative models were established as safe the exemptions were quickly removed. By creating an incentive for innovating firms to provide accurate information while reducing the ability of any individual firm to corner the market (Victor and Coben 2005) this approach reduced the uncertainty that often plagues regulation.

The TOCs also played a central role on the second front: expanding and deepening the regulatory scope of the regime. Each round of target-setting begins with a technical assessment of the feasible level of regulation as well as the impact of possible regulations on what ultimately mattered—levels of chlorine and bromine (the main ozone-destroying agents) in the atmosphere. This helped the regime move beyond the "easy" chemicals and uses for which there were

ready substitutes to chemicals, such as methyl bromide, where the politics of regulation would be much harder to manage.

The experimentalist approach of setting provisional goals and focusing on feasibility through real-world experience was perhaps most important on the third front—engaging developing countries. Had developing countries refused to join the agreement, the efforts by industrialized nations would have been offset (and then some) by growth of ODS production in the rest of the world.

Developing countries were concerned about cost. They were brought into the Montreal Protocol by an offer to compensate them for the full cost of compliance, but with the (penalty default) proviso that any country that stayed outside the regime faced trade sanctions. Politically, this arrangement transformed the politics of cutting ODS from a contest between industrialized countries (that cared a lot about the ozone layer) and developing countries (that professed to care little) into a much simpler problem of targeting income transfers that, to date, total about $3 billion (UNEP 2014a Annex I). Making that transformation a reality required a focus on exact costs and systems for accountability—the TOCs along with a special multilateral fund (MLF) that made sure the money was spent wisely turned that promise into a reality (UNEP 2014b).

Though it figures prominently in many detailed accounts of the operation of the Montreal Protocol, the importance of the review mechanisms has been largely overlooked in studies of the politics of climate change. The conventional view of the Montreal Protocol is that it succeeded because the ozone problem was "easy" to address or because governments set ambitious targets and the market found ways to comply. Of course, the ozone problem has been structurally easier to address than climate change—the total costs are lower, the full compensation of developing countries for compliance costs made membership easier, and the desire of major producers to have their products regulated all made substantial contributions (Oye and Maxwell 1994; Barrett 2008). All that said, a close look at the history shows that Montreal worked because the regulatory system was closely connected to technical assessment and extensive review of how technical rules were implemented (Greene 1998; Victor 1998; Parson 2005; Barrett 2006). As Ted Parson, a leading scholar of the ozone regime, writes:

> Although the Protocol's adoption of concrete international CFC controls represented an important first step, these provisions for repeated review and modification of its control measures represented the most central contribution to the ozone reduction regime's subsequent adaptation and ultimate success. (Parson 2005, 231)

A ratchet was important in Montreal. Keeping the ratchet connected to reality was even more important.

IMPLICATIONS FOR BUILDING BLOCKS AND CLIMATE CHANGE

Now we apply the logic of XG to climate change. Decomposition of the global climate-change problem into building blocks is the first step. But decomposition must be organized in a way that induces firms and regulators to search for and identify effective solutions, and then to apply those solutions to other areas and other countries. The theoretical logic of XG and the practical application in the Montreal Protocol offer some insights into how this might be done. But what are the implications of those insights for climate-change diplomacy and institutional building? Here we outline elements of an answer, starting with the limits of the current system, centered on the UNFCCC, then pointing to alternative agents of reform that, linked by XG institutions, could both make a substantial contribution to reducing the risks of climate change and help the UN institutions adjust from the outside in.

XG depends on an institutionalized process for setting provisional goals, then reviewing, revising and generalizing them as efforts at implementation warrant. The present system of climate-change diplomacy is capable of none of this.

Currently, countries articulate their efforts to realize the goals of the UNFCCC in pledges, known formally as Intended Nationally Determined Contributions (INDCs). Some proposals for bottom up diplomacy use these commitments as a starting point. But at present the INDCs are a mess. Absent any standards or format for presenting goals and results in INDCs, countries mostly use them to celebrate their plans and accomplishments. Few bother to do even that. At this writing, in May 2015, only 9 INDCs have been submitted—by the EU and just 8 of the nearly 200 parties to the UNFCCC. A stronger system of pledging should be a top priority after Paris.

The system for reviewing pledges within the UNFCCC is no better. There are recent proposals to create a strong review mechanism (UNFCCC 2015, para. 19). But agreeing to an effective alternative within the UN system is likely to be impossible so long as agreement requires, as now, unanimity.

Given these limits there should be greater emphasis on what forerunner countries are doing outside the UN process. Countries (and sectors of industry or agriculture) that see their actions as good examples for others to follow and do not fear—indeed want to learn from—searching review could volunteer themselves for extensive peer review and active XG-style learning. Candidate countries include, among many others, Denmark, Ireland, Norway and Uruguay, all of which are leaders in applying XG methods to environmental problems. The EU is likely to play an especially prominent role as it is a leader both in the application of XG to environmental problems within its borders—for example through the Water Framework Directive (Korkea-aho 2015) and REACH

regulation of hazardous chemicals (Scott 2009)—and, as noted, the use of penalty defaults to achieve extraterritorial effects.[3]

China is likely to participate as well, and will be more inclined to do so in a less politically salient forum than the UN, such as the recently established US-China arrangements on climate change. In return for tangible benefits China will subject its national policies to international scrutiny, as it did with accession to the WTO and, less conspicuously, by inviting the World Bank and the International Energy Agency to review its economic and energy policies (IEA 2012; World Bank 2014).

NGOs could also play an important role in building review mechanisms of their own as complements and backstops to the intergovernmental process. Many NGOs are gearing up to assess the INDCs. NGOs already actively monitor important areas of climate policy such as REDD+ and FLEGT initiatives (Overdevest and Zeitlin 2014) on land use and forestry, and industry-oriented initiative to control methane emissions. NGOs can both perform reviews and, under some circumstances, threaten penalty defaults against firms and governments that don't participate.

These efforts to improve goal setting and review should go hand in hand with exploration of new institutional designs, particularly for funding efforts by developing countries. As with the Montreal Protocol, the best way to fund projects, and to couple funding to ongoing review are not clear *ex ante*. For example, as the Green Climate Fund takes shape it might be useful to create a separate funding window, with additional XG reporting requirements, to evaluate high-risk/high-return proposals that would otherwise compete against projects using the established methods most attractive to typical program officers.

As we argued above, improved goal setting, review and institutional design make it easier to establish penalty defaults—because requirements are tethered to what is in fact feasible—and penalty defaults extend the ambit of climate-change cooperation. Hence when countries pledge action on climate change and agree on review procedures they should also indicate where they intend to impose costs on those that don't make equivalent efforts at abatement—something that the INDCs, which focus mainly on a nation's own actions, currently ignore. Far from lamenting such action as unilateral threats, climate diplomats and other

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[3] Note, however, that with respect to accounting for reductions in carbon emissions in connection with its implementation of UNFCCC requirements the EU's system of bookkeeping has been anything but experimentalist, and has on occasion been an obstacle to practical problem solving. For discussion of Ireland and the problems with EU climate mitigation bookkeeping see NESC (2012) and O'Donnell et al. (2015).

supporters of the regime must recognize that asymmetries in power can be enormously helpful in advancing the goals of the regime—provided they temper their unilateralism by allowing outsiders the autonomy to achieve the club goal by the means best suited to their context. As EU and US experience shows trade sanctions can play an important role in this connection, the long and inconclusive debate about the compatibility of the trade regime and climate change policy notwithstanding (Bacchus et al. 2010; Cosbey and Mavroidis 2014; Young 2014).

CONCLUSION

For most governments and analysts steeped in the politics of climate change, "bottom up" has been more a fallback position than a strategy. It is typically a local intimation or imitation of the stalled global solution. It is defined more by what it is not—the failed top-down effort—than by a clear understanding that decentralized governance, by fostering on-the-ground problem solving, may be able to address problems that more encompassing regimes cannot, and thereby change for the better the politics of comprehensive bargaining. It has not helped that early instances of bottom-up diplomacy on climate change were advanced as pretexts or diversions, as when the Bush administration tried to cobble together a coalition of willing supporters for an Asia Pacific Partnership after withdrawing from the Kyoto Protocol in 2001.

This article has made the case for decomposing climate change into discrete problem solving efforts, engaging ground-level actors, not as a backstop Plan B but as the proper, central strategy for responding to the global problem. The key to success of this bottom-up or building block strategy is the institutionalization, through XG, of learning to reduce uncertainty and thereby increase the possibilities for extending local successes, not least through penalty defaults.

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