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Toward Effective International Cooperation on Climate Change: Numbers, Interests and Institutions

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Introduction

Arild Underdal's exposition on the problems of international cooperation is marked by sparseness and clarity. His models are elegant and uncomplicated, his prose disarming in its precision. I first met Arild Underdal through his students and colleagues, who were my collaborators in a research project at the International Institute for Applied Systems Analysis (IIASA) in the middle 1990s. They (and soon I) grappled with the implications of Underdal's "law of the least ambitious program," a seminal model that explains why so many formal international agreements did little more than codify the interests of laggards.¹ Arild Underdal's "law of the least ambitious program" holds that the effectiveness of an international agreement is limited by the commitment level of the agreement's least interested party. Cooperation schemes ("trade-offs") can be used in theory to entice reluctant parties; in practice, however, these schemes are likely to be difficult to construct and monitor and are thus underutilized. Actual levels of cooperation will deviate little from the least ambitious. Some of the most important studies at IIASA were animated by the desire to find ways around the sober pessimism of Underdal's law.² Many of the remedies involved varying the membership and commitments of countries that participated in the formation and operation of a regime and these countries' commitments. In other words, we focused on "variable geometry" solutions to problems of international cooperation—an approach that has been quite successful in the formation of the Eu-

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1. Underdal 1980.

2. Andresen 1998; Skjærseth 1998; Stokke 1998; and Wettestad 1998. See also generally Victor et al. 1998.

ropean Union—and in those studies we were guided by Arild himself who became a key adviser to the IIASA project.

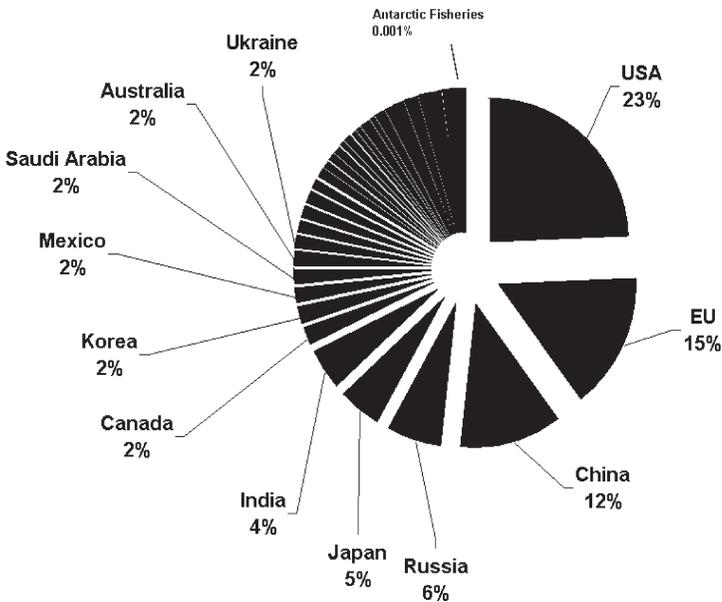
In this essay I'd like to revisit Underdal's law, along with some findings from the IIASA project it helped to inspire, to suggest ways to improve international cooperation on climate change. The time for new thinking is opportune. The Kyoto Protocol is set to run through 2012, yet negotiations on the form and substance of international commitments for 2013 and beyond have just begun. Although the diplomatic community is talented at painting stiff smiles on their client instruments, the situation with Kyoto does not portend well for the planet. The world's largest emitter, the US, is not a member of the treaty. The second largest emitter, the EU, has joined Kyoto and is making some significant efforts toward compliance, but these barely alter the global trajectory of CO₂ emissions. The third largest emitter, China, is a member but faces no limit on its emissions (which will soon surpass those of the EU). The fourth largest emitter, Russia, is a member only because the treaty condones inaction and offers the prospect of profit from selling surplus emission credits. The fifth largest emitter is Japan, whose interests are similar to those of the EU, but who is struggling to find ways to adjust greenhouse gas emissions. The sixth is India which, like China, has vehemently protested limits on its emissions. (For a summary of major emitters, see figure 1.)

According to Underdal's law, a treaty negotiated by these emitters (and a host of other countries whose interests are not dissimilar to those of the "big six") will be nearly devoid of substance. That's because the interests of these different countries diverge—some, such as China and Russia have little ambition for effective cooperation. This prediction accurately describes Kyoto's fate; the "commitments" being implemented under Kyoto are, in effect, a non-cooperative outcome.³ Governments have promised to do what they would have done anyway. The European Union's efforts reflect that some European governments (especially in the Northern countries with active Green parties and publics who are animated by the dangers of a changing climate) are under intense pressure to address the issue even as other Europeans (notably the ten new entrants as well as most of the poorer nations in the south) are not. The developing countries and Russia are focused on development, not controlling emissions, and thus they have consented to participate in an agreement that requires no efforts whose cost is not compensated. And in a few cases (notably Australia and the US), governments misunderstood or misrepresented what they could deliver and made erroneous promises in Kyoto. Those nations realized their false promises in painful ways and have since withdrawn. The United States, under the Bush administration, has withdrawn in a particularly aggressive and unconstructive fashion.

Crafting a more effective climate change response requires returning to

3. Barrett 1994.

Figure 1.
Allocation of World Emissions



fundamentals, and here I briefly address three: the demand for international cooperation; the numbers of countries participating and their interests; and the design of the institutions that aim to promote cooperation. For each a woolly conventional wisdom has arisen, but a closer analysis suggests policy choices that vary considerably. And for each we can look to Arild Underdal in part, to chart a path toward more effective international institutions.

1. The Demand for Cooperation

Every analysis of international cooperation must begin with the question: who wants to cooperate, and why? The conventional wisdom is that global cooperation arises out of the interests shared by all countries, to varying degrees to address the problem of changing climate. Failures to cooperate, therefore, are the result of some “market failure”—for example, the failure of countries to understand their interests, or the transactional difficulties associated with assembling many nations into a cooperative solution. International institutions—such as treaties, organizations, and behavioral norms—aid cooperation by reducing those transaction costs, focusing efforts on particular solutions, creating reputational risks for failure and the like.⁴

4. Keohane 1984; and Young 1989.

The demand for cooperative climate policy, like any matter for international collaboration, should not be conceived in general terms but through the eyes of particular societies and the governments who serve as their agents. This is the standard rationalist assumption that usually holds.⁵ The following four aspects of climate damages will affect whether and how nations are likely to mobilize to address the dangers of changing climate.

One aspect of this issue is the increasing capacity of societies to “climate proof” themselves. An ever-smaller fraction of economic activity depends directly on the weather and climate; human capacity to adapt to changing weather, such as by building dikes and irrigation systems, has risen sharply in the last century and shows no sign of exhaustion.⁶ The countries that have the greatest capabilities to respond to changing climate and which are also, in general, the largest emitters (at least on a per-capita basis) are also those most proofed against vagaries in the climate.

A second important aspect of what is known about climate effects is that their time horizons are long. Thus the calculation of reluctant developing countries is, perhaps, entirely rational. Combating global warming would require them to incur possibly a substantial cost in controlling emissions today for quite uncertain benefits in the future. By contrast, they could invest the same resources today in development, which automatically will improve their future capacity to adapt if climate should change (while also achieving many other benefits from development). This line of logic is rooted in Wildavsky’s famous dictum that “richer is safer.”⁷

A third aspect of climate science is that in fact some societies might welcome a dose of new climate—up to a point. The most famous of these is Russia (and more generally the former Soviet Union), where agriculture and forestry—which are the most climate-sensitive of economic activities—probably stand to gain from the longer growing seasons that accompany warmer weather.

The fourth aspect of climate damages is that there is one scenario for changing climate that all countries have an unequivocal interest in avoiding: abrupt (or so-called “catastrophic”) climate change, such as would be caused if any of the following were to occur: the sea level were to rise a meter or more over just a few decades; the world’s climate were to “flip” to a different regime; warming destabilized large amounts of methane currently locked in the permafrost (which would trigger still more warming, as methane is a strong greenhouse gas); or the ecological integrity of the Amazon or some other huge swath of the world’s ecosystems were undermined. Even the most “climate proofed” societies will have a hard time responding to such abrupt change. Natural ecosystems, which societies tend to value even more as they become wealthier, will be particularly vulnerable to extinctions and other catastrophic consequences if the climate changes abruptly. Paleoclimatologists have uncovered evidence for

5. Sprinz and Vahtoranta 1994.

6. Ausubel 1991.

7. Wildavsky 1988; and Schelling 1992.

incidents of abrupt climate changes in the past⁸ and some models point to such dangers over the next century.⁹ This is one of the few ways that risks of climate change could become evaluated in ways that are akin to traditional security threats, and nearly every society has shown that it is willing to spend something (often much) to avert even low probability threats that could have large catastrophic consequences.

These four attributes of the climate problem make it possible to venture some predictions. It seems likely that all societies will be willing to contribute at least marginally to the effort to avoid extreme dangers. However, nobody knows how to chart the thresholds, and societies are likely to vary in their tolerance of risk. For example, as with Russia, Canadian agriculture stands to benefit from a longer growing season. But some Canadians are much more concerned about the risks of unchecked climate change—such as on the country's permafrost region—and thus the country as a whole is now making some effort to control emissions. Political entrepreneurs are discovering that extreme events make for a more compelling political logic for controlling the emissions that cause climate change, and with time and learning an ever-larger amount of political activity on climate change will focus on these scenarios.

For the same reasons, efforts to build an international regime to control climate change on a shared "objective" are likely to fail because countries, in fact, do not have shared assessments of the danger and opportunity. Article 2 of the UNFCCC lays out exactly that objective (it calls for avoiding "dangerous anthropogenic interference in the climate system"), and considerable diplomatic and scientific effort have focused on putting Article 2 into practice. Those efforts are built on an unrealistic vision of politics. In fact, there is a whole range of interests and objectives; the only area where they are likely to coincide is in avoiding obviously extreme scenarios. But those obvious extremes are so distinct in time that they have no meaningful impact on the debate today.

Underdal's pessimistic logic is particularly applicable here because the dispersion of interests partly explains the difficulty of collective action. If some key emitters are unconcerned with all but an extreme change in climate then even those who are more risk-averse will be reluctant to invest in emission controls that could be undone by others whose efforts lag.

2. The Supply of Cooperation: Numbers

A second area of misrule by conventional wisdom concerns the architecture of cooperation. Analysts and diplomats have arrived at the conclusion that climate change is best addressed through cooperative processes that are broad in membership. Part of this conventional wisdom rests on the observation that climate

8. Lourens et al. 2005.

9. Broecker 1987; Oppenheimer 1998; and National Research Council 2003.

change is a global problem and thus requires a global solution. Part rests on the notion that cooperative regimes are best established in broad, nondiscriminatory terms and then deepened with experience.¹⁰ Here, too, the conventional wisdom is incomplete or wrong.

All else equal, cooperative regimes with broad membership are better for global problems than are narrow systems. But the choice of a broad regime carries costs that are so severe that “all else” is never equal. These costs include, notably, the complexity of negotiating package deals among countries whose interests are highly diverse. Complexity probably rises exponentially with membership because each new member creates new nodes in a network of relationships (and thus complications). And leverage over the problem—measured by emissions—saturates quickly as numbers rise. The top six emitters (counting the EU as a single emitter) account for 64% of world emissions of CO₂ from burning fossil fuels; the top dozen are responsible for about 74%. Gaining another ten percent of emissions requires adding another 10 countries. Political scientists haven’t worked out a tight, empirically grounded theory to suggest the optimal number of countries to engage. But we do have some theoretical tools that point to the minimum number of countries (or units) that must participate to make collective action rational—the so-called “k group.”¹¹ My hunch is that it is about a dozen—the top ten emitters from burning fossil fuels, plus Brazil and Indonesia (two of the top emitters of CO₂ from changes in land use). At numbers greater than a dozen negotiating complexity will overwhelm the advantages of additional leverage. If engaging fewer than a dozen members, the club will be too exclusive to gain leverage and too exclusive to allow concerns about the disadvantages to competitors. Even with a relatively small group it will be extremely difficult to negotiate a viable package deal—interests vary enormously and so do the starting points. (China’s per-capita emissions, for example, are one-tenth that of the US.)

Advocates for broad membership claim that larger numbers are needed, nonetheless, to confer legitimacy on the enterprise, promote shared understanding, and set standards. The legitimacy claim is hardest to test, but the accumulated evidence in other areas of international cooperation suggests it is wrong. The World Trade Organization, notably, has emerged to be the most effective example of global cooperation by focusing, through the original General Agreement on Tariffs and Trade (GATT), on a limited number of countries whose interests (and capabilities) were sufficiently aligned to allow cooperation. Over time, experience and success have allowed deeper and wider cooperation (and also led to negotiations that extend over much longer time periods because they are more complex). Widening and deepening occurred at the same time, rather than in sequential order. The GATT round that ended in the early 1990s with the creation of the WTO has included much more than simply the

10. Schmalensee 1990; and Sand 1990.

11. Hardin 1982; Schelling 1978; and Snidal 1985.

tariff bindings that were the core of the first GATT agreement. Similarly, the EU emerged from a more focused cooperation (on infrastructures and key commodities such as coal and steel) among a limited number of countries. With experience and the confidence of success the EU has expanded and deepened. The recent expansion to include 10 new countries, and the agenda for talks with Turkey, may test the limits of EU expansion.

In these cases, along with most instances of deep cooperation, the role of “legitimacy” is probably a lot less important than the practical benefits that arise from crafting agreements around the core interests of a smaller number of countries. Avoiding the distraction of peripheral or contrary interests is especially important for the case of climate change because many of the countries that have been centrally involved in the “broad then deep” approach to regime building would be harmed by successful efforts to control emissions—these include major hydrocarbon exporters (e.g., OPEC members, most of whom are members of the UNFCCC and Kyoto), countries wary that successful efforts to control emissions might inspire obligations for them to do the same (e.g., most developing countries), and economies worried that any harm to major consuming markets will hurt their exports (again, notably developing countries). It is possible to craft agreements to accommodate these diverging interests, but such arrangements are complicated and costly to design—as are most diplomatic efforts that deviate from obvious common interest.

Thus the basic logic of the problem suggests the need for much smaller numbers, and in the next section I’ll explore some ways to achieve that. It may be possible to gain broad universal agreements on some aspects of the climate change issue—for example, in setting standards for data reporting. Yet even there we should be skeptical that broad approaches make sense. The IIASA study found that schemes for data reporting and review are difficult to divorce from substantive commitments.¹² Rigorous monitoring of compliance is absent from the formal texts of nearly every international environmental agreement, in part because most agreements are laden with symbolic commitments that were never intended to be enforced and mainly because most agreements are designed to deliver high levels of compliance. Self-reporting of data is common, which allows some review of compliance. But the IIASA studies have shown that rarely is much done with the data that are reported; also rare are efforts to check the quality (accuracy and comparability) of such data. Even one of the most effective examples of reporting and review in international environmental cooperation—the Montreal Protocol’s Non-compliance Procedure—has been plagued by problems of poor data quality because the system was never designed with the capacity to confront countries with conflicting data and claims of violation.¹³ In the case of the ozone layer these problems have not been par-

12. Victor et al. 1998.

13. Greene 1998; and Victor 1998.

ticularly severe because the countries with the highest capacity to address the problem have been motivated to eliminate ozone-depleting substances (ODS); the countries with lower capacity and greater wariness are paid the “agreed incremental cost” of controlling emissions and unlikely to have a strong incentive to report incorrect data. The climate problem could be quite different because the stakes are much larger and the full cost of all cuts in emissions by reluctant countries may not be paid by advanced industrialized nations.

3. Organizing Cooperation: The Role of Institutions

A third area of erroneous conventional wisdom concerns the design of institutions. Here, the common assumption is that legally binding instruments, negotiated within the universal framework of the United Nations, are the best keystones for international cooperation. Much of that conventional wisdom is based on practice: every high profile global environmental problem has been the subject of a global binding treaty and thus, by assumption, treaty instruments must be best.

The evidence for this proposition is scant, and the Norwegian team organized around Arild did a series of studies that suggested that nonbinding institutions often perform much better. Nonbinding agreements are more flexible and less prone to raise concerns about noncompliance, and thus they allow governments to adopt ambitious targets and far-ranging commitments. In contrast, binding agreements are usually crafted through processes dominated by lawyers who are particularly focused on assuring compliance. A binding commitment might be useful for codifying an effort that is already in hand (or which requires actions that are easy for governments to deliver). But uncertain, strenuous efforts at cooperation are easier to organize when the commitments are not formally binding. Non-binding commitments, alone, can be as ineffective as much binding law (or even more so). However, the nonbinding instrument allows for a process through which governments commit to (and implement) more ambitious courses of action. This liberating role for nonbinding instruments usually requires high-level political engagement and special institutions that review and focus on national performance.¹⁴

The experience with international cooperation in the North Sea, and acid rain in Europe—done by Arild’s Norwegian colleagues—seem to support this thesis about the greater effectiveness of nonbinding instruments.¹⁵ In those cases, and in the Baltic Sea,¹⁶ there had been efforts to use binding instruments to address the problems at hand, but those efforts often fell short. In the North Sea and Baltic Sea regimes, the addition of ministerial-level conferences that included ambitious (but non-binding commitments) helped, in part, to break the

14. Victor 2000.

15. Skjærseth 1998; and Wettestad 1998. See also generally Victor et al., eds. 1998.

16. Roginko 1998.

logjam. In the European acid rain regime, more ambitious non-binding commitments to control NO_x (a leading cause of acid rain) were adopted by a smaller number of countries alongside a binding convention to address the same pollutant. In all three of these cases the nonbinding efforts alone did not lead to more effective cooperation. Rather, at least three elements were necessary for effectiveness. First, the commitments required high level attention—usually at ministerial level—to improve the prospects for real implementation. Second, the nonbinding commitments worked because they were embedded within institutions that could mobilize detailed performance reviews, which are especially important when commitments concern areas of activity where it is difficult to gauge the best implementation strategies at the outset. In the North Sea and Baltic Sea regimes, notably, the nonbinding commitments along with extensive review helped to focus attention and effort on the difficult-to-manage problem of land-based pollution runoff. Third, the commitments and review should be part of an ongoing relationship so that the shadow of future interactions (and linkages across issues) discipline current behavior.

The propensity to use binding instruments despite growing evidence that nonbinding agreements can play an important complementary role may help to explain the extremely large supply of shallow environmental cooperation (Downs et al. 1996). In Europe, the first targets for cutting the emissions that led to acid rain were signed in 1985 and required only a 30% cut (below 1980 levels) in SO₂ emissions. Such commitments typify shallow cooperation—they didn't affect competitiveness, cost little to implement, and for most countries had little effect on behavior. Eight years were allowed for compliance; several countries had complied by the time the ink on the 1985 Sulphur Protocol was dry. Many countries made deep cuts in emissions but the most dramatic reductions were mainly achieved by countries that would have made those cuts anyway.¹⁷ Similarly, the 1972 London Dumping Convention, which is famous for banning ocean dumping of high-level (and now also low-level) radioactive materials, was spearheaded by the United States because by the early 1970s the US had already passed national legislation to halt such dumping.¹⁸ For the US, and scores of other countries that had no waste to dump, the treaty yielded symbolic benefits while requiring no marginal change in behavior. (The treaty also put into place a backstop against future dumping, although it remains unclear whether that is a benefit or a cost. It has forced land-based solutions to radioactive waste disposal although under the ocean floor, if not for the London Convention, might actually be an environmentally superior sequestration.) Treaty registers are littered with similar examples. No doubt that part of this phenomenon is the consequence of environmentalism as a mass movement. Especially in liberal democracies, where public opinion is both fickle and relevant to political

17. Levy 1993.

18. Personal communication with Gordon MacDonald, member of US Delegation to the negotiations for a London Dumping Convention.

survival, governments are constantly on the prowl for actions that have low short-term costs and high symbolic value.

Environmental cooperation has been focused on problems that are easy to solve—games of harmony or simple coordination.¹⁹ Environmental cooperation has rarely tackled problems of real collaboration, where self-interested parties defect from the solution that is best for their collective interest, unless they face strong penalties (enforcement) or inducements (compensation) to implement costly measures and sustain the collective effort. Every environmental issue has within it a universe of cooperation games—from harmony cases where interests align, to coordination games where there is a self-enforcing agreement but initial dispute over the best design, to collaboration games where each member cooperates only if it thinks others will as well, to instances of deadlock where no meaningful agreement is possible. For example, the effort to protect wetlands spans from a game of harmony (e.g., governments agree to declare their intention to protect wetlands) to coordination (e.g., governments agree to focus wetland protection efforts on wetlands along bird migration corridors) to deep collaboration (e.g., every government to specific costly measures that, collectively, ensure protection of bird migration routes) to deadlock (e.g., governments agree not to alter wetlands from their natural state and to forfeit one billion dollars in escrow if they don't comply). The global 1971 Ramsar Convention, which is the focus of international legal efforts to protect wetlands, is at the harmony end of the scale. Other regional agreements that affect wetlands, notably in Europe, are examples a bit further along the scale to coordination. Thus for the purposes of political analysis, there isn't a "wetlands" problem but rather many different wetlands problems.

The multiplicity of problem types may explain why treaty registers are filled with so many environmental treaties. As soon as an issue appears on the international agenda, almost immediately an effort is launched to negotiate an agreement. If the treaty-making process were focused on reaching agreements to *solve* the environmental problem at hand then treaty registers would be practically empty. Instead, the negotiation process is a diplomatic effort to identify the problem type that can earn agreement. Since the willingness to pay is often low when negotiations begin and failure to reach agreement yields symbolic costs, the negotiation process usually discovers a way to frame the issue at hand so that the agreement is marked by harmony or simple coordination. Most issues that arrive on the environmental agenda can quickly yield a stable, shallow agreement. My sense is that over the last three decades—from the 1972 Stockholm Conference to the present—the efficiency of this search for shallowness has increased as participants and institutions have learned how to play the

19. Throughout this essay I use terms from two-party game theory to illustrate different types of incentives that affect a party's interest in cooperation and interest in abiding by the agreed terms of cooperation. These terms are to illustrate ideal types. The details are obviously much more complicated when the game is multiparty. Nonetheless the basic insights from the game types of harmony, coordination, collaboration and deadlock terms still apply.

game. It has become easier to agree on formats and language because models can be adopted from the scores of precedents. Extant organizations can serve new agreements. Institutionalization has facilitated further institutionalization. This process may also explain why nearly every effort at environmental cooperation now begins with a “framework convention” that is long on vision and procedure but short on commitments. No other area of international cooperation has adopted this kind of process because, perhaps, no other area of cooperation is so focused on ensuring the delivery of symbolic benefits.

It is no surprise, therefore, that many agreements result, participation in those agreements is high, and compliance is nearly perfect. That outcome is a reflection of binding design.

Binding instruments still play an important role—not so much as leaders of action but as codifiers. That, indeed, is one of the ways that binding instruments contributed to the overall effectiveness of the North Sea, Baltic Sea and European acid rain regimes. By this theory, international cooperation emerges through ambitious commitments, efforts, and experiments that are undertaken more readily when agreements are nonbinding. Through those experiments governments gain confidence in what they can deliver and then become more willing to embrace binding commitments. Applied to the case of climate change, the strictest elements of cooperation will emerge from the “bottom up,” rooted in experience, rather than being imposed “top down” through commitments whose ambition is realized through binding enforcement.²⁰ That’s what we learned from Arild Underdal’s skepticism about international cooperation, although I suspect that even Arild would be surprised (perhaps alarmed) by the direction this research has taken.

4. Toward a New Synthesis

On each of these three fronts—the demand for international cooperation, the numbers of essential countries, and the choice of instruments—conventional wisdom is not well rooted in the actual practice of effective international cooperation. With an eye to conventional wisdom, the advocates who care most about devising effective solutions to the climate problem have, ironically, sent policy astray into schemes and institutions that are neither sustainable nor likely to exert much leverage.

A full solution to this problem, I hope, awaits the end of my current collaboration on a new climate policy book. The solution will include large-scale research and demonstration of new technologies, since efforts to cut the cost of controlling carbon will make everything else politically easier. It will include some new strategies for engaging developing countries. And it will include some new approaches to international cooperation that draw on the influence of Arild Underdal.

20. Victor et al. 2005.

In the area of international cooperation the solutions lie in efforts to create a club of a small number of important countries and craft the elements of serious cooperation. Those efforts probably can't emerge within the UNFCCC process because it is too large and inclusive. Nor can it easily arise from other available forums, such as the G8, because their membership is too skewed to include the core dozen or so countries that must be part of an effective solution. The most interesting idea for a new institution is outgoing Canadian Prime Minister Paul Martin's concept for a forum of leaders from the twenty key countries (L20). Martin has offered a general vision;²¹ a series of meetings have applied the concept to major issues in world affairs, including climate change and energy (www.l20.org). Whether by creation of a new institution such as the L20 or reform of an existing forum such as the G8, such a standing body would offer a way to craft deals among the smaller number of countries that matters most. (Even then, 20 may be too large.)

Success with this institution will require careful attention to underlying interests and to the institutions needed for follow-up. A deal that simultaneously involves the advanced industrialized countries and key developing countries must find a way to engage the latter without requiring the politically impossible task of getting them to agree to cap their emissions. My colleagues Tom Heller and P.R. Shukla have offered one solution to the problem—to identify development paths that coincide with the developing countries' interests while also reducing emissions that cause climate change—and our book project will elaborate those schemes in more detail. (Examples include clean natural gas infrastructures in China, which would help the Chinese address local air pollution problems while also cutting by half the emissions of CO₂ when compared with coal.) Success with those schemes should help to change interests and make the wariest nations more willing to control their emissions.

The variable geometry of the L20 (or a reformed G8) can play a large role in overcoming the pessimism of Underdal's law. At the same time, a concerted effort to focus on more effective ways to slow climate change can offer a model that is useful for many other troubling issues in international cooperation.

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21. Martin 2005.

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