

The Transnational Politics of Energy

Robert O. Keohane & David G. Victor

Abstract: Creating effective energy policy is hard, in part because it often requires effective international coordination. For most salient energy-related issues – such as control of the emissions that cause global climate change or the building of stockpiles to make oil supplies more secure – international coordination is inherently difficult. Solutions lie in making these problems more manageable by working in small groups of relevant countries; successful cooperation also hinges on finding incentive-compatible commitments that align, to the extent feasible, with national interests and are focused on areas where cooperation will yield tangible joint gains. The outcomes of such cooperation efforts are likely to be decentralized complexes of networked institutions rather than integrated, hierarchical treaties that govern a coherently defined issue-area.

ROBERT O. KEOHANE, a Fellow of the American Academy since 1983, is Professor of Public and International Affairs in the Woodrow Wilson School at Princeton University.

DAVID G. VICTOR is a Professor in the School of International Relations and Pacific Studies at the University of California, San Diego, where he also serves as Director of the Laboratory on International Law and Regulation.

(*See endnotes for complete contributor biographies.)

For countries to deal successfully with energy issues, they must engage in international cooperation. This requires being strategic in selecting issues to address. Although domestic politics undoubtedly takes center stage in formulating energy policy, energy markets and environmental problems have both become global. As a result, any nation's actions to reduce greenhouse gas emissions meaningfully, to secure reliable energy supplies, or to stabilize energy prices will be affected by the actions of many other countries. International considerations raise hurdles in the formulation of effective national policies, but they can also create opportunities. In this essay, we explore when such opportunities can arise, how some hurdles to effective international coordination can be cleared, and how analysts and policy-makers should think about the design and impact of international regulatory frameworks. We argue that the structure of international cooperation on some energy problems, such as climate change, is prone to deadlock. But by recrafting these problems – usually by making them “smaller” and focusing on the areas where national interests are better aligned for international cooperation – participating countries can avoid an impasse.

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In the first volume of this two-volume special issue of *Dædalus*, editors Robert Fri and Stephen Ansolabehere ask, “Why is creating energy policy so hard?”¹ Focusing on the United States, they identify a number of reasons, three of which could be summarized as follows:

1. Most important, the U.S. public does not want to pay more for energy even though full social-cost pricing is key to a coherent energy policy.
2. In particular, the U.S. public does not put significant weight on global warming as a driving force for policy regarding choice of fuels and energy technologies.
3. Finally, the competitive and intensely polarized state of U.S. politics means that no policy elite can develop and impose a coherent energy policy without facing the impossible task of appealing to extreme positions while also retaining enough centrist support to achieve policy passage.

The problems are *not* principally about a lack of scientific knowledge, and they cannot be rectified with research. Instead, the problems are political and, as the first volume makes clear, apparently intractable. Action can be taken at the margin. For example, the Obama administration recently imposed new regulations that make the construction of new coal-fired plants in the United States very unlikely while also creating strong incentives to shut down a large fraction of the existing (mainly older) coal-fired plants. Overall, however, as volume 1 suggests, the political forces needed for major changes in U.S. energy policy are not in place. This second volume, which also focuses primarily on the United States, devotes much attention to the underlying behavioral and institutional forces that drive decision-making and choice. While there are some

causes for optimism, this volume echoes the pessimistic message of volume 1.

It would be gratifying to report that the situation in other countries looks more promising, and there are indeed some glimmers of hope. The European Union is in principle committed to reducing emissions by 80 percent by 2050; there is more support in most of the European Union for vigorous action on climate change – and, therefore, on energy – than elsewhere in the world.² But Europe is declining as an economic force, accounting now for only about one-fifth of the world’s commercial energy consumption.³ China and India are rising forces in energy (and most other matters of international importance). Together, these two countries account for at least half of the likely growth in energy consumption and global warming emissions over the next three decades. If the advanced, industrialized countries continue to struggle with economic stagnation as well as meeting limits on emissions, the share of growth in emissions from these and other emerging economies will be even greater.⁴ Both India and China (especially China) have aggressive national programs to address some aspects of energy use, such as the need to cut local pollution and raise energy efficiency; nonetheless, independent national action is unlikely to add up to an effective global response on any of the major energy issues requiring international coordination. Neither China nor India integrates its oil stockpiles with the International Energy Agency (IEA) system, and both have signaled wariness about entering into binding international agreements on climate change.

International cooperation is essential for an effective global response to energy and climate change issues, but true international coordination is inherently diffi-

cult to organize. Because there is no world government, effective collaboration must involve states, multilateral institutions, and those firms and non-state actors that play important roles in an issue-area. Such cooperation does occur, most notably in trade through the World Trade Organization (WTO), in development through the World Bank, and on monetary issues – at least when crisis concentrates the minds of elites and publics – through the International Monetary Fund and Group of 20 (G-20). But with respect to energy and climate change, cooperation has been halting at best.

Under favorable conditions, cooperation emerges because there are tangible joint gains to be reached, such as benefits from international trade. In economic terms, as long as the status quo lies below the Pareto frontier, arrangements can be made that benefit all parties – provided that agreements are reliably crafted and enforced. In such situations, cooperation emerges not out of harmony but from the discord that has hitherto prevented parties from capturing these potential joint gains. Discord in such situations adversely affects the interests of all participants, generating mutual desire for policy coordination that all crucial players find preferable to what would otherwise ensue.⁵ Our task in this essay is to apply the logic of international cooperation to energy questions. In many respects, there is little that is “new” about energy. The fundamental challenges to and opportunities of political action within and among countries are familiar.

Conditions for cooperation at the global level vary by the nature of the problem. Problems that are close to pure coordination problems – with minimal conflicts of interest – are relatively easy to solve. For example, establishing common rules that all aircraft will follow as they fly through different national airspaces involves com-

plex transnational coordination on topics such as radio frequencies, language, and the design of navigational equipment, but these rules raise few difficult political issues because interests usually converge around a focal point that provides the basis for a solution. Often these focal points simply reflect the path blazed by early, large adopters. When distributional issues loom large, however, problems become more difficult: wrangles over “who pays” are familiar.

Also important is whether the benefits in question accrue to those who take action. Participants are more likely to invest in cooperation when its benefits accrue only to them than when nonparticipants also benefit. When benefits can be appropriated, actors can employ reciprocity to generate cooperation because one party’s cooperative actions are contingent on reciprocal moves by others. If the sequence of moves extends indefinitely into the future, and if the prospective benefits to each party are substantial, the reputations for credibility that develop can lead to sustainable cooperation.⁶ Leadership is also more likely to be forthcoming when potential leaders see that they can appropriate benefits from their actions.

By focusing on these two dimensions of cooperation problems – that is, the degree of conflict of interest and whether benefits accrue to cooperating states or are more widely diffused – we can generate expectations about the relative difficulty of solving different energy-related problems at the international level. Table 1 provides a useful stylization of the various cooperation problems. When there are few distributional issues and private goods are involved, we expect relatively easy cooperation on a voluntary, decentralized basis between parties that will benefit (upper left-hand quadrant). In contrast, when severe distributional issues and public goods are in play, as in the lower-right

*Robert O.
Keohane &
David G.
Victor*

Table 1
Four Basic Problem Structures: Prospects and Strategies for Cooperation

	Cooperation Focuses on <i>Private</i> Goods	Cooperation Focuses on <i>Public</i> Goods
<i>Low</i> Conflict over Distribution of Gains and Losses	Harmony: Least severe challenges for cooperation; soluble when parties know their interests	Hegemonic cooperation: Soluble when a large country obtains a large enough share of the benefits that it is willing to invest in cooperation that benefits all
<i>High</i> Conflict over Distribution of Gains and Losses	Iteration: Soluble with repeated play	Entrenched discord: Most severe challenges; difficult to solve unless problem is broken down into smaller units where harmony, iteration, or hege- monic cooperation strategies are available

Source: Table created by authors.

quadrant of Table 1, cooperation is very difficult. No single actor or small set of actors has incentive to bear the costs and risks of cooperation; potential leaders do not step in because they fear having to pay disproportionately for revealing their preferences for action.

The off-diagonal boxes in Table 1 represent intermediate situations, in which cooperation is conditional on some other variable. If the goods are public but relatively inexpensive to provide – keeping distributional issues relatively minor – a single participant or small group may find it worthwhile to bear the expense of providing the public good (Table 1, upper-right quadrant). In this scenario, the hegemonic actor or small group benefits, on balance, even after paying the costs; others get a free ride. Finally, if goods are private but distributional issues are pronounced, devising institutions that promote repeated play, in which no actor makes huge unconditional commitments and confidence is slowly built up over

time, can promote cooperation (Table 1, lower-left quadrant).

Table 1 shows that the prospects for cooperation (and the appropriate institutional design) depend on the “problem structure.” The two dimensions shown in Table 1 are not the only possibilities; problems vary in many other ways, such as whether costs and benefits are proximate or far into the future. However, this simple framework is a useful first step in analysis. Applied to international energy problems, the framework in Table 1 reveals why some problems have garnered cooperation while others fester. Table 2 applies that framework to some major energy-related issues that have inspired efforts at international coordination. In the following sections, we illustrate how the problem structure affects the degree of cooperation on each set of issues, and then draw some implications for policy.

Cooperation is easiest in areas marked by *harmony* because countries already have an

Table 2
Energy Issues by Problem Structure

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	Cooperation Focuses on <i>Private Goods</i>	Cooperation Focuses on <i>Public Goods</i>
<i>Low Conflict over Distribution of Gains and Losses</i>	Harmony: Example: phaseout of fossil fuel subsidies agreed by the G-20; agreements to “transfer” technology	Hegemonic cooperation: Example: coordinated management of international oil market, including strategic oil stockpiles, through the IEA
<i>High Conflict over Distribution of Gains and Losses</i>	Iteration: Example: investment in deploying new energy technologies through U.S.-China bilateral energy partnership	Entrenched discord: Example: constructing an effective global regime for climate change or energy

Source: Table created by authors.

incentive to make needed changes in policy. Nonetheless, many of these cases look like instances of international cooperation, in which agendas are set for international talks, diplomats and political leaders meet and wrangle over texts, and agreements are forged. But underlying those overt efforts at cooperation is a problem structure that almost guarantees success.

Consider the G-20’s 2009 agreement to phase out fossil fuel subsidies.⁷ Many countries were already far along in the process of removing subsidies for conventional fossil fuel technologies and redirecting those subsidies toward new energy technologies – notably, renewables. A large amount of research had documented the harmful fiscal and environmental effects of these subsidies and had shown that where subsidies promoted consumption of imported fuels, they also degraded national energy security. By the time the G-20 took up the matter, the various national policy efforts were far from complete. In India, for example, large subsidies for kerosene and electric power, which had originally been justified

on grounds that they helped promote welfare in rural, poor populations, had become politically entrenched. But even in these cases, governments were mobilized and making progress in changing policy.⁸ In the large energy-producer members of the G-20 – notably in Russia, and to some degree Saudi Arabia – substantial market-oriented (and subsidy-reducing) energy-reform efforts were under way. (The world’s biggest users of fossil fuel subsidies – Iran and Venezuela – were conveniently not members of the G-20, and their subsidizing behavior remains unswayed by the G-20’s proclamations.) The politics for significant (if not complete) subsidy reform were aligned within nearly all the major G-20 nations.⁹ Conversely, if the G-20’s subsidy reform agenda had included other topics on which the countries did not already agree – such as realigning subsidies for renewable energy or nuclear power – the prospects for bold international agreements would have been dim.

Even in these cases of harmony, international cooperation is not automatic;

active efforts at cooperation are often needed. For example, international agreements such as the 2009 G-20 deal can generate common knowledge of commitments and help lock collective gains into place, preventing backsliding.¹⁰ They can reduce the costs of transactions – for instance, by creating a focal point for future cooperation. Work on fossil fuel subsidies could beget reforms on other types of subsidies. (As governments, besieged by fiscal austerity, start reforming renewable power subsidies on their own, the prospects for international cooperation on these subsidy reforms will rise as well.¹¹) Visible success in an important area of policy can signal to countries that are not members of the cooperative effort – in the case of fossil fuel subsidies, that includes most major energy exporters – that reforms are both needed and feasible.

Problems that seem intractable, whether because they have severe distributional implications, involve public goods, or both, often become much easier to manage as a result of exogenous changes in policy, technology, or other circumstances. For example, consider the issue of *technology transfer*: that is, the overt (by gift or with concessional funding) transfer of hardware and intellectual property from rich industrialized countries to developing countries. Ever since the New International Economic Order of the 1970s, most international talks on energy and environmental issues that include developing countries have also involved contentious diplomacy on technology transfer. Every major international environmental treaty crafted from the 1980s to the present has included different obligations for industrialized and developing countries; in many cases, such as in the ozone layer accords, special funds have helped countries on both sides of the rift find common ground and engage in collective action.¹²

Meanwhile, an array of changes in national policy and economic growth is making technology transfer easier. Since the late 1980s, barriers to trade in products with high intellectual property content have plummeted because states have viewed it as advantageous to open trade, within or outside the WTO. For example, a sweeping set of reforms in India in the early 1990s reduced or removed barriers to importing foreign energy technologies. As a result, Indian manufacturers of these technologies have been forced to become more competitive, foreign suppliers now have new markets in India, and new power plants in India are significantly more efficient than the older vintages.¹³ (Higher efficiency means lower emissions as well as lower use of fuel, reducing the danger of national shortages of coal and dependence on large coal imports.¹⁴) The sharp uptick in economic growth in all the major developing economies, at least until recently, has also boosted demand for trade in technology and focused governments on the national policies needed to keep energy use in check.

All these changes have made technology transfer much easier. This progress has not erased the regular theatrical discussion of technology transfer in global environmental talks, but it has led markets to transfer much more technology. A problem with the characteristics of discord was transformed into one that much more closely approximates harmony.

Turning to the off-diagonal boxes in Tables 1 and 2, we now consider the two kinds of cooperation known as *hegemonic cooperation* and *iteration*. The most visible historical example of multilateral cooperation on energy – the IEA’s efforts to coordinate large oil consumers and manage oil markets – arose largely as a result of hegemonic leadership by the United States. In the wake of the first oil shock,

the large oil consumers saw a compelling need to join forces. Given that oil is a fungible commodity, unilateral action by one consumer (for example, hoarding) can be harmful to other major consumers, while concerted action (for example, the coordinated filling and release of oil stockpiles) can improve the welfare of the collective. Cooperation of this type aims to provide public goods but does not face severe distributional barriers. At the time, all the large oil importers were already cooperating on other economic issues through the Organisation for Economic Co-operation and Development (OECD). Thus, they assigned the task to a new agency created within the OECD: the IEA.¹⁵

The second oil shock (in 1979) revealed that the mechanisms the oil importers had created did not work well in a crisis, compelling the IEA to tighten its procedures and strengthen its systems for intergovernmental cooperation. Since then, no oil shocks of that severity have occurred – in part because large changes in the oil markets and the elimination of most price controls and quota systems have made market signals more effective in encouraging the private sector to stockpile and adjust behavior in line with fundamentals. The few tests of the system, such as in the aftermath of Hurricanes Katrina and Rita in the United States (which knocked out a large fraction of U.S. oil-refining capacity), suggest that the system is truly cooperative and reasonably effective.

Hegemonic leadership took a problem marked by strong incentives for countries to defect and made cooperation more likely. While all consuming countries stood to gain from coordination, the largest consumer (the United States) was positioned to reap the largest benefits. Thus, the United States had a strong incentive to incur most of the costs and risks associated with

establishing the IEA.¹⁶ Once created, the institution has endured even as U.S. economic power (in relative terms) has waned. Whether the IEA can endure the rise of new economic powers remains to be seen. Both China and India are large oil importers, and thus both gain from effective coordination of stockpiles and management of the oil market; but both also have strong incentives to accept a free ride. China, in particular, faces strong internal pressures to seek security through unilateral actions – namely, special deals that “lock up” supplies for China, import quotas, and a national system of oil stockpiles that is large yet whose purpose and operation are shrouded in secrecy.

Looking at the lower-left box in Tables 1 and 2, iteration can help yield cooperation in areas where the parties might disagree about the allocation of benefits and costs but are able to internalize the gains from cooperation. In such settings, countries will cooperate if they are confident that the other side will not defect. While there are many ways to boost confidence, one of the most reliable is through iteration. Past cooperation becomes a reliable signal that more cooperation is possible, and the prospect of future interaction focuses minds on long-term gains rather than short-term opportunities to defect. Joint investment agreements are an example. Solving most energy problems requires new technologies, and most energy technologies are capital-intensive and fixed to the ground. Most intellectual property also requires high up-front costs and a long time horizon for profitability. As a result, a large fraction of international investment disputes concern energy technologies such as power plants. Yet cooperation produces huge gains because it raises overall levels of investment (which generally leads to more secure and less polluting energy systems). Moreover, a larger international market gives inno-

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vators more installations on which they can test new ideas that, through learning, yield technological change. Iteration is one of the logics behind bilateral investment treaties (BITs), and it is also the logic that inspires the U.S.-China bilateral innovation and investment talks.

“Energy” intersects with many other issue-areas, including climate change; thus, there are often calls for coherent international arrangements to manage these problems. In light of the framework presented in this essay, it is not surprising that a coherent international regime does not exist for either energy or climate change, let alone both of them together. In a word, these issue-areas fall into the lower-right box of Tables 1 and 2: *discord*. Understanding why there is no such regime for climate change helps explain the absence of an energy regime as well.

International regimes – institutions with legally binding rules – are formally constructed by elites who represent state interests as they conceive them. A coherent climate change regime on the model of the Kyoto Protocol would impose large sovereignty costs on states by committing them to carbon emissions targets far into the future. Adhering to these targets would be very expensive in economic terms, and leaders who took action would capture almost none of the material benefits. Limiting climate change is a public good because CO₂ emissions affect Earth’s climate – a public good that is available to (and potentially tarnished by) all peoples. Making matters worse, *future generations* would be the major beneficiaries, but present generations would pay the cost. It is difficult to imagine either democratic or authoritarian leaders paying significant costs during their terms of office for the sake mostly of people yet to be born in other countries, unless the prospect of climate change becomes so severe and pal-

pable that ordinary people begin to worry intensely about it.

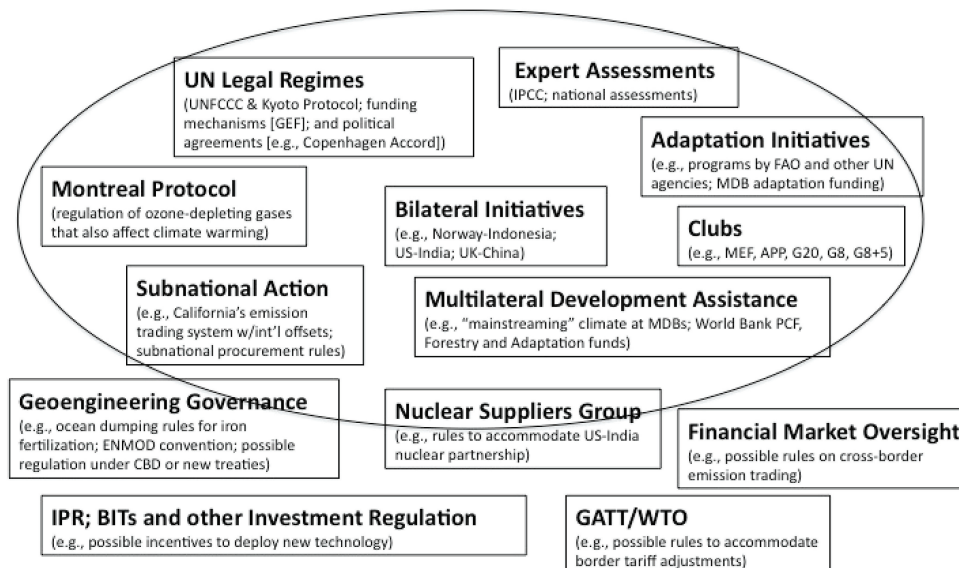
With respect to energy, the distributional problems are even more serious. A rise in the price of oil, while good for producers, is bad for consumers. The situation is not zero-sum because both sides have an interest in relative stability. That stability might, in fact, arise through iteration – such as current efforts by oil suppliers and users to improve the quality of data about the oil market – were the conflicts over distribution not so large and the economic consequences of energy supply so highly diffused. But interests diverge sharply. The interests of oil producers, reflected in the Organization of Petroleum Exporting Countries (OPEC), and those of consumers, reflected in the IEA, are often at odds with one another. Consumers want security of supply, price stability, and relatively low prices. The producers are divided between price hawks and relative moderates, such as Saudi Arabia, which value stability more highly; but their joint preference, certainly, is for higher prices than consumers prefer. And some producers want to retain the “oil weapon” to put pressure on consuming countries with respect to other issues, such as political relationships in the Middle East.

As a result of these centrifugal political forces, efforts in the contemporary world to construct integrated regimes that limit the extent of climate change and assure the supply of energy have failed. Instead, there is in each issue-area a *regime complex*: a loosely coupled set of specific regimes, as depicted for climate change in Figure 1. The most important reason for the emergence of a regime complex rather than a coherent regime lies in the nature of state interests as described above: that is, due to intense distributional conflict and high uncertainty, incentives for states to make commitments are low. Yet both broad issue-areas present opportunities for

Figure 1

The Regime Complex for Managing Climate Change

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Boxes show the main institutional elements and initiatives that make up the climate change regime complex. Elements inside the oval represent forums where substantial efforts at rule-making have occurred, focused on one or more of the tasks needed to manage the diversity of cooperation problems that arise with climate change; elements outside are areas where climate rule-making requires additional, supporting rules. Guide to acronyms used in the figure: Asia-Pacific Partnership on Clean Development and Climate (APP); bilateral investment treaty (BIT); Convention on Biological Diversity (CBD); Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD); Food and Agricultural Organization of the United Nations (FAO); General Agreement on Tariffs and Trade (GATT); Global Environment Fund (GEF); Intergovernmental Panel on Climate Change (IPCC); intellectual property rights (IPR); multilateral development bank (MDB); Major Economies Forum (MEF); Post Conflict Fund (PCF); United Nations Framework Convention on Climate Change (UNFCCC); World Trade Organization (WTO). Source: Reprinted from Robert O. Keohane and David G. Victor, "The Regime Complex for Climate Change," *Perspective on Politics* 9 (1) (March 2011): 10.

greater convergence on particular issues, or for smaller "clubs" to act. Remarkably, for example, the European Union has made significant commitments to take deep action.¹⁷ The result is a regime complex rather than a coherent regime or the absence of agreement altogether.

In other words, discord helps explain why there is no coherent, integrated regime for climate or energy and why, instead, "complexes" of institutions have emerged in both areas. Progress is being made on issues that pose few conflicts of interest, are dominated by one or a few

states, and in which iteration over time enables cooperation to emerge and sustain itself: that is, issues that fall into the upper half and lower-left cell of Table 2.

The emergence of a regime complex rather than an integrated, comprehensive regime on issues such as energy and climate change should not lead us to despair. On the contrary, policy-makers who seek more effective limitation on the magnitude of climate change can use regime complexes to their advantage. And the availability of a regime-complex policy

strategy suggests that countries most committed to doing something about energy issues should reflect on how to take advantage of the flexibility and adaptability of regime complexes, insofar as the more coherent approach of an international regime remains unavailable.

One potential advantage of regime complexes lies in the faults of integrated regulatory systems that are already apparent in the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. It is difficult to design effective regulatory systems in the context of a multiplicity of cooperation problems, a broad and shifting distribution of interests, extreme uncertainty about which measures governments are willing and able to implement, and ambiguity about how to craft viable linkages. When regimes are constructed, therefore, they are likely to be unwieldy – a product of political compromise. But the difficulty of renegotiation will lead participants to cling to existing institutions, which take on monopoly characteristics. For example, the broad coalition of developing countries – the Group of 77 and China – lambasted attempts led by rich countries to work in small groups and outside the UNFCCC process during the run-up to the Copenhagen conference, despite mounting evidence that the formal sessions were making little progress.

The dysfunctions of the UNFCCC monopoly are especially evident in the Kyoto Protocol's Clean Development Mechanism (CDM), a system for encouraging low-emission investments in developing countries. Over the long term, engagement with developing countries is essential; it is mathematically impossible to reach deep cuts in world emissions of warming gases without these countries' participation. The main compensation mechanism for enticing developing countries to participate has been linkage to emission credit

markets through the CDM. Yet studies suggest that, due to poor administration, perhaps two-thirds or more of CDM credits issued do not represent bona fide reductions in emissions. Despite this realization, it is proving very difficult to fix the CDM. The complex and highly politicized nature of decision-making within its UN-based administrative system as well as the UNFCCC and the Kyoto Protocol have precluded meaningful reform.

While institutional monopolies have dysfunctions, a regime complex can be too fragmented. Components may conflict with one another in ways that yield gridlock rather than innovation; the lack of hierarchy among specific regimes can create critical veto points; and forum-shopping can lead to a "race to the bottom." Various crises in the energy regime complex over the years – notably the oil price surges associated with the 1973 to 1974 Arab state oil embargo and the Iran-Iraq war, particularly from 1979 to 1980 – disrupted consumer markets.¹⁸ We are not arguing that regime complexes are necessarily better than other institutional forms. Instead, we view them as likely outcomes in areas such as energy and climate, where grand issue-wide efforts at international cooperation are likely to yield discord. In the linked issue-areas of energy and climate change, an integrated regime might be attractive as the most legitimate institutional form, but efforts to craft such a regime face enormous political and organizational barriers. The result of efforts to construct such systems in these issue-areas will be gridlock and only weak substantive commitments. A more loosely coupled system is inevitable.

If governments and non-state actors seeking more effective management of climate change and energy issues behave strategically, they can use fragmented institutions to their advantage. A broad topic such as "climate change" or "energy"

consists of many detailed areas for international cooperation, including the reform and eventual elimination of most fossil fuel subsidies; the creation of incentives for private investment in new low-emission technologies, such as renewables, nuclear, and natural gas; and reforms to existing institutions such as the CDM. Decentralized institutions can be more inviting for leader countries that wish to take action on one or more of these topics yet find the full agenda daunting. For such reasons, elsewhere we have argued that regime complexes, if managed well, offer at least two distinct advantages over efforts to create single, integrated regimes: flexibility across issues and adaptability over time.¹⁹

Dispersed institutions also have disadvantages, including multiple opportunities for manipulation, a proliferation of veto points, and gridlock as well as the fact that it is time-consuming and costly not to have a single set of rules. Therefore, proposals for specific elements, such as new clubs, that would further fragment climate institutions should be carefully assessed relative to whether they would enhance the overall performance of the regime complex. Whether the proliferation of different forums working on these issues is an asset or liability depends on how these dispersed efforts are coupled.²⁰

Yet thinking about regime complexes rather than simply focusing on the Kyoto climate change regime can open up interesting possibilities for policy action. For example, it may be possible to address non-CO₂ contributors to climate change, such as black carbon, methane, lower atmospheric ozone, and industrial gases such as chlorofluorocarbons (CFCs) and hydrofluorocarbons.²¹ Thus, while taking care to ensure that the regime complex does not become dysfunctional, climate policymakers should look for additional actions that are feasible within the framework

outlined in Tables 1 and 2 and seize opportunities to design programs consciously built on hegemonic power and iteration.

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Domestic policy choices with respect to energy and its externalities depend heavily on the potential for successful international cooperation. Without ambitious global agreements and processes for detailed policy coordination, many potential actions (such as raising the price of carbon) are likely to be politically infeasible within individual countries because they will create competitive disadvantages. Even innovative countries – such as the EU nations acting on climate change – will be wary of adopting national measures that impose costs much greater than what can be justified through international cooperation. Wise energy and climate change policy hinges on what sorts of international agreements are viable.

We have argued that the feasibility of potential international agreements depends on problem structure as indicated in Tables 1 and 2, which emphasize concerns over access to public goods and the severity of distributional issues. Directly tackling issues that involve both public goods and severe distributional issues – which, unfortunately, include core issues of energy and climate change – is likely to be futile. But this conclusion is not a recipe for inaction. Instead, it suggests the need to identify elements within those broad topics where the problem type is more amenable to cooperation, where basic harmony of interests or hegemonic power and iteration can be brought to bear.

For countries to deal meaningfully with energy issues over the next decade, they must engage in international cooperation. To do so successfully, they will need to be strategic in choosing the issues they will address.

* Contributor Biographies: ROBERT O. KEOHANE, a Fellow of the American Academy since 1983, is Professor of Public and International Affairs in the Woodrow Wilson School at Princeton University. A member of the National Academy of Sciences, he has served as Editor of *International Organization* and as President of the International Studies Association and the American Political Science Association. His publications include *Power and Interdependence* (with Joseph S. Nye, Jr., 1977), *Designing Social Inquiry: Scientific Inference in Qualitative Research* (with Gary King and Sidney Verba, 1994), and *Power and Governance in a Partially Globalized World* (2002).

DAVID G. VICTOR is a Professor in the School of International Relations and Pacific Studies at the University of California, San Diego, where he also serves as Director of the Laboratory on International Law and Regulation. His publications include *Climate Change: Debating America's Policy Options* (2004); *Natural Gas and Geopolitics: From 1970 to 2040* (edited with Amy M. Jaffe and Mark H. Hayes, 2006); and *Global Warming Gridlock: Creating More Effective Strategies for Protecting the Planet* (2011), which *The Economist* named one of the best books of the year.

- ¹ See Robert W. Fri and Stephen Ansolabehere, "The Alternative Energy Future: Challenges for Technological Change," *Dædalus* 141 (2) (Spring 2012): 5–9.
- ² *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Roadmap for Moving to a Competitive Low Carbon Economy in 2050* (Brussels: European Commission, August 3, 2011).
- ³ *Statistical Review of World Energy 2011* (London: BP, 2011).
- ⁴ *World Energy Outlook 2011* (Paris: International Energy Agency, 2011).
- ⁵ Robert O. Keohane, *After Hegemony: Cooperation and Discord in the World Political Economy* (Princeton, N.J.: Princeton University Press, 1984).
- ⁶ Robert Axelrod, *The Evolution of Cooperation* (New York: Basic Books, 1984).
- ⁷ G-20, *Leaders' Statement: The Pittsburgh Summit*, Pittsburgh, Pennsylvania, September 24–25, 2009, <http://www.canadainternational.gc.ca/g20/index.aspx?lang=eng&view=d>.
- ⁸ Rahul Tongia, "The Political Economy of Indian Power Sector Reforms," in *The Political Economy of Power Sector Reform: The Experiences of Five Major Developing Countries*, ed. David G. Victor and Thomas C. Heller (New York: Cambridge University Press, 2007), 109–174; and Navroz K. Dubash and Sudhir Chella Rajan, "Power Politics: Process of Power Sector Reform in India," *Economic and Political Weekly* 36 (35) (September 1–7, 2001): 3367–3387, 3389–3390.
- ⁹ David G. Victor, *Untold Billions: Fossil-Fuel Subsidies, Their Impacts and the Path to Reform – The Politics of Fossil-Fuel Subsidies* (Geneva: Global Subsidies Initiative of the International Institute for Sustainable Development, October 2009).
- ¹⁰ For a general discussion of this point with respect to international institutions, see Keohane, *After Hegemony*.
- ¹¹ David G. Victor and Kassia Yanosek, "The Crisis in Clean Energy: Stark Realities of the Renewables Craze," *Foreign Affairs* 90 (4) (2011): 112–120.
- ¹² Elizabeth R. DeSombre and Joanne Kauffman, "The Montreal Protocol Multilateral Fund: Partial Success Story," in *Institutions for Environmental Aid*, ed. Robert O. Keohane and Marc A. Levy (Cambridge, Mass.: MIT Press, 1996), 89–126.
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- ¹⁴ David G. Victor and Richard K. Morse, "Living with Coal: Climate Policy's Most Inconvenient Truth," *Boston Review* (September/October 2009).

- ¹⁵ Wilfrid L. Kohl, "Consumer Country Energy Cooperation: The International Energy Agency and the Global Energy Order," in *Global Energy Governance: The New Rules of the Game*, ed. Andreas Goldthau and Jan Martin Witte (Washington, D.C.: Brookings Institution, 2010), 195–220. Robert O. Keohane & David G. Victor
- ¹⁶ Robert O. Keohane, "The International Energy Agency: State Influence and Transgovernmental Politics," *International Organization* 32 (4) (Fall 1978): 929–951.
- ¹⁷ The nature of the problem structure makes us skeptical about the sustainability of these proposed cuts, absent reciprocal action by other major emitters.
- ¹⁸ OPEC revenues quadrupled between 1972 and 1974 and increased by more than 50 percent between 1978 and 1980. See Jeffrey Colgan, Robert O. Keohane, and Thjis van der Graaf, "Punctuated Equilibrium in the Energy Regime Complex," *Review of International Organizations* 7 (2012): 117–143, Table 4.
- ¹⁹ For this argument, see Robert O. Keohane and David G. Victor, "The Regime Complex for Climate Change," *Perspective on Politics* 9 (1) (March 2011): 14–16.
- ²⁰ In the climate change issue-area, such forums are indicated in Figure 1 and include the G-20 Major Economies Forum (MEF), various technology and investment partnerships, and private sector and nongovernmental initiatives. In the energy area they include, in addition to OPEC and the IEA, organizations such as the International Energy Forum and the International Renewable Energy Agency. See Keohane and Victor, "The Regime Complex for Climate Change"; and Colgan, Keohane, and van der Graaf, "Punctuated Equilibrium in the Energy Regime Complex."
- ²¹ David G. Victor, Charles F. Kennel, and Veerabhadran Ramanathan, "The Climate Threat We Can Beat: What It Is and How to Deal With It," *Foreign Affairs* (May/June 2012); and *Towards an Action Plan for Near-Term Climate Protection and Clean Air Benefits*, UNEP Science-Policy Brief (Nairobi: United Nations Environment Programme, 2011).