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Chapter 1
The Global Challenge of Climate Change

Climate change is arguably the most compelling global issue of our time. Along with nuclear war, it is the world's only challenge that could conceivably threaten the continuation of human life on the planet as a whole. Its negative effects are already evident in the increasing frequency, severity, and unpredictability of deadly heat waves, fires, droughts, floods, hurricanes, tsunamis, dying coral reefs and other deteriorating ecosystems, melting ice, and infectious disease from insects invading long immune domains. Growing evidence suggests it could submerge the coastal cities of major powers, or even extinguish some small island states beneath the warming and thus expanding and rising seas. Because climate is a complex adaptive system, driven by only partly understood, path-dependent processes, cumulative effects, non-linear dynamics, multiple feedback mechanisms, and abrupt system shifts, it is especially difficult to predict its precise course and consequences. It is equally difficult to control through the galaxy of intergovernmental organizations inherited from the 1944–1945 order with their selective, siloed, slow-moving structures and the mechanistic management models and approaches at the core.

Yet the global community showed long ago that, through visionary leadership, it could take the prescient, preventive, ambitious steps to control climate change before its major and perhaps irreversible harmful effects arrived and moved beyond human control. On June 28, 1979, at the conclusion of their Tokyo Summit, the leaders of the Group of Seven (G7) major market democracies called for "alternative sources of energy" that would "help to prevent further pollution" caused by the "increases of carbon dioxide and sulphur oxides in the atmosphere" (G7 1979). They thus acknowledged through this voluntary consensus the need to halt immediately, at 1979 levels, the concentration of carbon dioxide in the world's climate. In the following five years, they and the other countries in the Organisation for Economic Co-operation and Development (OECD) moved in this desired direction, as their emissions into the atmosphere declared (Sustainable Energy Development Center 2006, 48; Barnes 1994, 42).

In acting so boldly in 1979, G7 leaders were forwarding the more general carbon-controlling environmental principles embedded in their group from its very start. At the conclusion of their first summit at Rambouillet, France, on November 15–17, 1975, the six leaders of France, the United States, the United Kingdom, Germany, Japan, and Italy declared that "our common interests require that we continue to cooperate in order to reduce our dependence on imported energy through conservation and the development of alternative sources" (G7 1975). In 1976, now with Canada's leader present, they noted the need for the rational use of energy resources (G7 1976). In 1977, with the European Community added, they affirmed the principle of "more efficient energy use" (G7 1977). At the first summit Germany hosted, at Bonn in 1978, they directly declared: "in energy development, the environment and human safety of the population must be safeguarded with greatest care" (G7 1978). And then, in Tokyo in 1979, they took up the issue of carbon emissions directly and concluded that its concentration in the atmosphere must stabilize right away.

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The central role of the G7, and the Group of Eight (G8) with Russia added after 1998, in global climate governance stands in sharp contrast to the historic absence of any powerful broadly multilateral intergovernmental organization dedicated to the control of climate change.[1] The charter of the United Nations is silent about the existence, let alone the value, of the natural environment. The UN system lacks any specialized functional organization to deal with either energy or the environment overall, instead relying on the fragile United Nations Environment Programme (UNEP) created in 1972 (Kirton 2004a; Biermann and Bauer 2005; Lesage et al. 2010). The Atlantic system of international organizations, centred in the North Atlantic Treaty Organization (NATO) and the OECD, generated only the International Energy Agency (IEA) in 1974, from which France—one of the G8's original members—at first stood aloof. The global community thus was institutionally defenceless as the oil shocks of 1973 and 1979 from the Arab members of the Organization of Petroleum Exporting Countries (OPEC) assaulted the world economy, and as the trees dying from acid rain in North America and Europe showed that the increasing use of coal and other hydrocarbons polluted the atmosphere and killed living things. When George Kennan (1970), one of the world's pioneers of the post-World War II order, called for a new powerful plurilateral international institution to meet these ecological challenges, only the G7 responded to the call. The UN followed a different approach, establishing the weak UNEP in 1972, adding a few issue-specific conventions with their small, fragmented secretariats in 1992, and periodically holding summits on sustainable development (Strong 1973; Kirton 2004a). At the dawn of the twenty-first century, at its development-oriented Millennium Summit in New York in September 2000, the UN recognized at the highest level in a comprehensive context the existence and value of the natural environment in general terms (Kirton, Kulik, Bracht, et al. 2014). But it still took no major actions to put its new principle into effect through the Millennium Development Goals launched there (Kirton, Kulik, Bracht, et al. 2014). Nor did it do so with the required ambition at its Rio+20 Summit in June 2012.

The Debate among Competing Schools of Thought

It thus matters how, how well, and why the G8 and its related plurilateral summit institutions (PSIs) led by the Group of 20 (G20) since 2008 have led global climate governance during the 40 years in which they have been engaged in this task. To date, however, accounts of the G8's involvement and leadership in climate governance have been inconclusive, whether referring to that involvement directly or as part of the G8's broader environmental performance, and its relationship with the broader G20 and the UN. They range widely from judgements of harmful through irrelevant to effective and beneficial, and differ on why the G8 and G20 performed as they did and what their proper role should be.

The first school of thought considers G8 climate governance to be little more than domestically oriented deliberation and delegation (Bayne 2000b, 65). In this view, G8 leaders discuss pressing, high-profile environmental issues such as climate change for domestic political management, to satisfy attentive audiences back home. But they are otherwise anxious to delegate direction setting, decision making, and delivery to lower levels of the

1 Throughout this book, the term G8 is used to refer to the entire history of the G7 and G8, beginning in 1975 up until 2014. However, G7 is used in reference to events that took place when Russia became a member in 1998.

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G8 system, including to the ministerial, official, and multistakeholder bodies they created for this task. A variant of this school adds that "though G7 environment ministers began meeting regularly each year, this was not due to instructions from the summit, and it was not clear that the leaders paid much attention to their findings" (66).

Other schools see the G8 as far more effective, in more far-reaching ways, but with vastly different results. A second school, focusing on principled and normative direction setting, views the G8 as the centre of ecologically destructive disciplinary neo-liberalism. Stephen Gill (2000, 18, 1) argues that the G7 acts in a "deliberate and strategic manner" at the centre of a disciplinary neo-liberalism that "tends to atomise human communities and destroys the integrity of the ecological structures that support all life forms," thereby generating a "crisis of social reproduction on a world scale, a crisis that is ecological as well as social."

A third school, led by Steven Bernstein (2000, 2001), argues in a similar if less far-reaching fashion that the G8 has been complicit in converting the ecological values that flourished at the birth of the UNEP in 1972 into a new doctrine of "liberal environmentalism" in which economic and market values took pride of place. Bernstein asserts that the G7 began in 1985 with a legitimation of the market norms of liberal environmentalism, then moved by 1988–1989 to the more state interventionist, Keynesian approach of the Brundtland Commission Report, but shifted in 1990 to market mechanisms once again. The cause was the preference of Margaret Thatcher's United Kingdom and Ronald Reagan's United States, with an implantation of the latter's policies coming when the administration of George H. Bush arrived in 1989.

A fourth school argues, in contrast, that the G8 continually asserted and progressively developed the principles and norms of "embedded ecologism" (Kirton 2002a; Hattori 2007). Here the values of environmental enhancement, trade liberalization, and social cohesion occupied an equal and integrated place, even though market-oriented neo-liberalism flourished in the early 1980s and trade values dominated from 1994 to 1998. The latter was due to a G8 deference and delegation to the new, heavily legalized and organized, "hard law" but ecologically unfriendly World Trade Organization (WTO) (Kirton 2002d, 2004a; Abbott et al. 2000). A very strong version of this school from Takashi Hattori (2007, 78–9, 91) argues that the G8 at its 1988 and 2005 summits developed ever expanding and interlinked environmental norms within Japan's public and its government, led to pro-environmental institutional innovation in the latter, and educated a future Japanese prime minister whose government led on climate change at the third Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC). The G8's domestic political and direction-setting performance was thus powerful, in part because of Japan's emerging domestic policy by 2005 of integrating environment, economy, and international cooperation.

A fifth school emphasizes institutionalized international interdependence as driving the G8 to ever greater performance on critical issues such as climate change and biodiversity, through its decisional, delivery, and development of global governance tasks (Kokotsis 1995, 1999). Here higher levels of G8 commitment and compliance came from the availability of the multilateral UN institutions after its Rio summit in 1992, the growing array of G8 environmental institutions, and more powerful environmental bureaucracies in G8 member governments to help those governments transform their collective commitments into implementing action. This school suggests that G8 governments were also inspired to do so due to the personal commitment and political capital of individual G8 leaders, perhaps as they presciently and responsibly recognized that international interdependence

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required collective action to address emerging ecological problems that were inherently global, even if these problems currently harmed outsiders far more than G8 members and citizens themselves.

A sixth school claims, in contrast, that the G8 was a growing environment and climate governor but an implementation failure, due to its lack of a secretariat, the changing agenda of each host, and its trusting, unmonitored delegation of environmental issues to the World Bank and International Monetary Fund (IMF). James Barnes (1994, 1–2) writes:

> Not until environmental organizations began to put forward initiatives to the G-7 in the mid-1980s were environmental topics addressed seriously. Since 1985, environmental and development issues have been featured with increasing prominence. Yet, as with many other G-7 issues, there has been little follow-up by the member Governments. This is partially because there was no "secretariat" for the Summits, and the tendency of each host Government to focus upon the current year's agenda rather than reviewing the commitments and concerns of prior years … [and] the continual referral of responsibilities by the G-7 to the World Bank and International Monetary Fund without simultaneously developing accountability mechanisms or reviewing how the Bretton Woods institutions have carried out their duties.

A seventh school sees the G8 more generally as a UN supporter, with varying effects. Joseph Aldy and Robert Stavins (2008) view the 2007 G8 Heiligendamm Summit, with its five invited guests of Brazil, China, India, Mexico, and South Africa (Group of Five, or G5, also sometimes referred to as "Plus Five"), as supporting the UN's climate governance by calling for a continuation of the UN approach in the post-Kyoto years. Others agree but judge the G8 too ambitious, due to its inappropriate adoption of the Kyoto approach of setting long-term targets and pressing to produce a similar, post-Kyoto regime. Andrew Green (2008) thinks that the G8 was wrong in 2007 to set a target of reducing emissions by 50 percent by 2050, as it should have focused on actions that could be done in the near term. Similarly José Goldemberg (2007) notes that the 2007 summit endorsed a Kyoto-like cap and trade approach, which was potentially very effective. Soledad Aguilar (2007) also notes that the G8 simply supported the UNFCCC as the appropriate forum for post-Kyoto negotiations, and did not do much by itself on climate change.

An eighth school presents the G8 as a UN supporter first, and fall-back governor should the UN fail. James Sebenius (1991, 111) notes that the 1990 G7 Houston Summit "endorsed expeditious framework negotiations" to produce the convention on climate change called for by the UN General Assembly in a unanimous resolution in December 1988. But he concludes that if this convention was unsuccessful, a small group of industrial states that had unilaterally committed to greenhouse gas control—the EU, European Free Trade Area, Japan, Australia, Canada, and others with stabilization or reduction targets—could produce a smaller-scale convention among themselves.

A ninth school, in contrast, points to the G8's informal governance as being appropriate from the start, due to the need for commitments to be voluntary and the refusal of the United States and other G8 partners to accept the sanctions that hard law regimes bring. Thomas Schelling (2002) argues that "neither the United States nor the other major developed countries will likely accept serious sanctions for missing emissions targets." A variant from George Kennan (1970) argues that a small group of 10 or so powerful and committed states, including the Soviet Union, had to act plurilaterally from the start to produce a badly needed global climate regime. Another variant from Peter Haas (2002, 77–80) suggests

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that G8 summits are effective on environmental and climate issues due to their small, ongoing, private nature, the nesting of G7 finance and trade ministers within international organizations such as OECD, IMF, and Bank for International Settlements, their lack of "profound political schisms," and the presence of popular concerns and perceived links to national interests. Similarly Manfred Milinski and his colleagues (2008) see the G8 as potentially creating climate cooperation because it embodies the small, non-anonymous groups that best preserve the common good.

A tenth school sees the G8 summit providing promising political leadership due to its members' mobilization of political will, in contrast to the pessimism that experts bring. Ruth Greenspan Bell (2006) notes that "many politicians are more optimistic. In July 2005, leaders of the group of eight highly industrialized states (G-8) pledged to put themselves 'on a path to slow and, as the science justifies, stop and then reverse the growth of greenhouse gases'."

The arrival of the G20 as a forum of finance ministers and central bank governors in 1999 and then as a leaders' summit in 2008 led to a focus on this broader plurilateral body and gave rise to a new debate about how and why the G20 did and could govern climate change.

Here the first school sees G20 failure. Jing Huang (2009, 439) argues that the G20 as an ad hoc, crisis-driven institution for networking and consensus formation has "yet to come up with any long-term plans or strategies for major global issues such as climate change, poverty eradication, water crisis, energy security, and food supply."

The second school sees potential effectiveness due to the G20's size, capability, leaders' prescience, issue linkage, and transparency. David Victor concluded that the G8 would not induce effective climate cooperation unless it included all the major carbon-producing powers (Victor et al. 2006; Victor 2006b). Victor (2006a, 101) suggested that Paul Martin's proposal for a leaders' twenty (L20) was "the most interesting idea" to cope with climate change because it offered the required small group, non-binding institution, and bottom-up approach. In the same spirit of broadening beyond the G8, from the political world Hillary Clinton (2007) held that "we must create formal links between the International Energy Agency and China and India and create an 'E-8' international forum modeled on the G8. This group would be comprised of the world's major carbon-emitting nations and hold an annual summit devoted to international ecological and resource issues." Peter Haas (2008b) saw the G8 plus China successfully creating technology cooperation for climate change mitigation. Once the G20 summit had arrived, Barry Carin and Alan Mehlenbacher (Carin and Mehlenbacher 2010a, 33) argued that the G20 is "as good as it gets" as a group with the potential to take effective action on climate change as it has the right number of members and amount of capability, and can be farsighted, create issue linkage, and fully disclose the values and interests of its members.

The third school sees G20 promise crowded out by financial crisis. David Victor and Linda Yueh (2010) assert that the G20, which "played the pivotal role in crafting new financial regulations after the Asian financial crisis, seemed to be a promising forum for addressing energy and climate issues as well, but topics such as the global economic meltdown of 2008 have crowded them out at the top of the agenda."

The fourth school sees the G20 as a proven performer in particular places. Joy Kim and Suh-Yong Chung (2012) argue that the G20 has effectively delivered on financing, phasing out fossil fuel subsidies, and engaging business stakeholders and has much potential to facilitate UN climate change negotiations. This potential is due to the G20's ability to build issue-specific coalitions, arising from its institutional flexibility, informal high-level

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dialogue, and ability to address diverse issues. Thijs Van de Graaf and Kirsten Westphal (2011, 28) agree that the G20's actions in phasing out fossil fuel subsidies show that it has great potential, based on its more representative membership than a G8 with a "good record" as an agenda setter and deliberative forum on climate change in the past.

The fifth school, arising more recently, sees the G20 producing results of broader importance in shaping a new multilateral regime. Sander Happaerts (2015) argues that discussions with rising powers in clubs such as the Major Economies Forum on Energy Security and Climate Change (MEF) and the G20 made it possible for those powers to consider making their own contributions to emissions reductions. The uncertainty of climate change and the diverse interests enhanced by the rise of big emerging powers in the failing UN regime led the major climate powers to "forum shop" to minilateral clubs such as the G20 and MEF. Starting in 2005, the G8 Plus Five led a strategy to separate the rising powers from the G77 and China to bring down the Kyoto "firewall," and develop a new regime based on a bottom-up, "pledge and review" approach. Within the UN, the Copenhagen Accord produced at the 2009 COP heralded the success of that approach (Happaerts 2015). Similarly, Sylvia Karlsson-Vinkhuyzen and Jeffrey McGee (2013, 74) conclude that such minilateral forums "appear to have exercised significant influence over global climate governance" by allowing powerful countries "to advocate a discourse supporting a more exclusive negotiation process and voluntary approach to mitigation commitments that appears to have flowed back into the UNFCCC process." Anthony Brenton (2013, 542) also argues that since 2005 the "Great Powers" began to meet more closely and that their cooperation contributed significantly to the Copenhagen Accord, "making their involvement crucial to the achievement of any worthwhile agreement." Maximillian Terhalle and Joanna Depledge (2013) agree on the need for the powers to cooperate but highlight the need for a multi-issue forum.

The sixth school emphasizes even more expansively the G20's past and potential central success in generating a new, effective climate control regime. Ross Garnaut (2014b, 223) argues that the G20 has a "track record" of leadership action on climate change with positive as well as "pending" outcomes. He argues that the G20 played an important role in setting the target of limiting temperature rise to no more than 2°C above pre-industrial levels at Copenhagen in 2009, in assisting domestic reform to reduce fossil fuel subsidies in some countries, and, at its 2013 St. Petersburg Summit, in reducing hydrofluorocarbon emissions. He thus concludes that the G20 is well suited to be the main forum to guide collective action on climate change, as it "contains the most influential developed and developing countries, can stand outside the entrenched and stereotypical divisions that have become barriers to effective action within the UNFCCC, with its huge and unwieldy membership and traditions of symbolic posturing" (2014a). Andrew Light (2009) similarly feels that the G20 had performed better than the UNFCCC in producing multilateral and bilateral success.

Puzzles

While each of these schools offers important insights, none adequately explains the particular pattern of how and why the G8 and then the G20 shaped global climate governance and thereby controlled climate change. In particular, none accounts for the failure of the G8, working with or without the UN, and reinforced by the Major Economies Meeting on Energy Security and Climate Change (MEM; later the MEF) and the G20 summits,

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to adequately control climate change after 2008, even as the world moved cumulatively toward a harmful temperature rise of more than 2°C.

With regard to the early years of G7 leadership, none fully accounts for the particular pattern of a reluctant America, especially under Republican presidents, adjusting through the G7/8 to the enthusiastic environmental leadership of Germany, Japan, Italy, and Canada, and of a Russia joining them in the Kyoto Protocol while leaving America alone on the outside. While Nicholas Bayne's collective management model of general G8 governance accurately accounts for the equal influence of the Europeans in inducing the Americans to adjust in the environmental field, it does not account for the critical role played in 2001 by the unlikely coalition of Japan, Canada, and Russia acting together, against and without George W. Bush's America, to bring the Kyoto Protocol to life. Nor does it account for the calculation of Tony Blair as host to the G8 plus the G5 at Gleneagles in 2005 that he could mobilize a newly re-elected Bush as an ally in the G8-led climate change control cause.

Such puzzles point to the need to conceive of the G8, always in potential and at key moments in practice, as a concert of equals in which any country can lead and align with any other, even against a strongly opposed and most powerful America, and thereby induce the US, and later countries outside the globally predominant club to adjust to produce a collective G8 and ultimately global result (Kirton 1999b). It further points to the need to conceive of the G8—with first another five members, then a full 17 in the form of the MEF, and, finally, as the G20—as an expanding club of equals acting as the hub of a global governance network for a globalized world (Kirton 2013a).

The value of such moves are reinforced by the puzzles presented by the case of climate change for all the traditional major explanatory models of G8 performance. The initial American leadership model developed by Robert Putnam and Nicholas Bayne (1987) cannot easily explain why effective G8 global environmental action flourished under Ronald Reagan and George H. Bush, but diminished in the latter Bill Clinton–Al Gore years and virtually disappeared during the early Barack Obama ones when the US had a committed president whose party controlled both houses of Congress. C. Fred Bergsten and C. Randall Henning's (1996) false new consensus model, with its portrait of impotent governments in a market-driven, globalizing world, cannot account for those periods and places of effective G8 environmental governance, in a world where ecological change is the ultimate global, domestically driven process, with complex, cumulative, interactive, and delayed effects that are difficult to anticipate, understand, or control. The model of democratic institutionalism developed by Ella Kokotsis (1995, 1999) has difficulty explaining why the G8's environmental performance and leadership appear to have declined after 1992, when the United Nations Conference on Environment and Development (UNCED) created more multilateral organizational capacity for implementation and when the G8 established its own annual environment ministers' forum. John J. Kirton's (1993) concert equality model has difficulty explaining the 1998–2004 decline in the climate change performance of an institution where Russia's inclusion had increased the club's global preponderance and ultimately internal equality both overall and in issue-specific ecological and energy capability, and where ecological interdependencies and inter-vulnerabilities had tightened in a finite world under increasing ecological stress.

These puzzles are only partly resolved by accounts of G20 summit governance since 2008 and by the systemic hub model that explains this performance (Kirton 2013a). On the surface, the G20 combines—as institutional equals in a single forum—the world's two leading climate polluters, China and the United States, and the world's major powers and polluters that cause and can thus control climate change. The first eight G20 summits

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from 2008 to 2013 dealt increasingly with climate change and started to shift the leadership of the world's evolving climate change control regime from the prevailing UN-led, divided, development-first one to a new, inclusive, equal, environment-first one. But as its ninth summit in 2014 dramatically revealed, the G20 faced severe internal divisions and remained unable to meet the challenge by creating a full control regime that worked, either outside or inside the UN.

Purpose

In the face of such puzzles arising from the existing accounts, this book has three primary purposes. The first is to chart the course of leadership in global climate governance in a complete way by adding the work of consequentially involved informal PSIs to a literature that overwhelmingly emphasizes the formal multilateral organizations of the UN system and the formal legal conventions and protocols they produced. This account thus focuses on the contribution of the G8 and the G20. In so doing, it seeks to build upon and broaden, rather than repeat, the rich analyses in the many important books already produced on UN-centred global governance of climate change (see Bodansky 2001; Hoffmann 2005; Weiss and Jacobson 2000; Rowlands 1995; Haas 2008b; Harris 2001; Bernstein 2001).

The second purpose of this book is to examine systematically the cadence and causes of the G8- and G20-centred contributions to climate change control. It identifies and describes, in as much detail as possible, the G8's initiation, shaping, and support of global climate governance, along with the many times G8 leaders and their G20 colleagues withdrew from the playing field to focus on other things. To chart G8 performance carefully over these phases and to identify the key trends, this book applies to G8-centred climate governance the six dimensions of performance highlighted by the concert equality model of general G8 governance and by the systemic hub model of G20 governance: domestic political management, deliberation, direction setting, decision making, delivery, and the development of global governance (Kirton 2013a). To explain such performance, it both conducts a detailed process tracing of the diplomacy ahead of, at, and after key G8 and G20 summits, especially in relationship to the UN, and fully applies the six causes highlighted by the concert equality model of successful G8 governance: shock-activated vulnerability; multilateral organizational failure; predominant equalizing capability; common democratic purpose; political cohesion based on leaders' domestic control, capital, continuity, commitment, competence, and public support; and the constricted, controlled participation of a cherished club. It adds the new cause contained in the systemic hub model of G20 governance—the G20 as an institutional and emerging interpersonal club that serves as the hub of a growing network of global summit governance for a globalized world (Kirton 2013a).

This study extends the concert equality and systemic hub models in several ways. It explores how visible shocks from the same or similar fields can catalyze G8 action in an issue area whose problem is characterized by chronic, cumulative, incremental and often invisible change and how shocks in different, less directly related areas can have a diversionary or general galvanizing effect. It also examines the competence of leaders to comprehend and act on the inevitably incomplete and contested scientific consensus about a phenomenon characterized by complexity, uncertainty, and the other attributes of complex adaptive systems. It further highlights individual leadership—how a single leader acquires the initial awareness of the problem and consequent willingness to act, and does

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so successfully, in highly proactive and prescient ways, long before subsequent shocks or shock sequences in the same issue area force slow, cybernetically learning leaders to adapt and long before a clear, scientific consensus forms.

The third purpose of this book, and in some ways the most important one, is to explore how informal PSIs, led by the G8 and G20, and the formal multilateral ones, above all the UN, interact to produce global governance on an issue as complex and challenging as climate change. In keeping with the anti-bureaucratic bias of G7 leaders, Kirton (1989, 1993) specified in the initial and revised concert equality model that the absence or failure of multilateral organizations in governing a particular problem generated G8 governance success (see also Putnam and Bayne 1987; Karlsson et al. 2012). In sharp contrast, in her book on G7 compliance with commitments made at G7 summits on the issues of climate change, biodiversity, debt relief to the poorest, and assistance to the former Soviet Union, Kokotsis (1995) argued that the presence of a powerful, dedicated, multilateral organization, such as the IMF in the field of finance, helped generate high G7 performance in the key performance dimension of delivery, while the absence of such an organization—as in climate change, especially prior to 1992—caused low compliance. However, subsequent work by Kirton and colleagues on the causal catalysts of compliance showed, in keeping with Kokotsis's democratic institutionalist model, that when G8 leaders referred in their commitment to the core, dedicated, multilateral organization on the subject, G8 members' compliance with that commitment generally rose (Kirton 2006a). A subsequent effort to construct and apply a full-scale framework to analyze the relationship between the G8 and multilateral organizations found that under different conditions, the G8 could work to produce a successful governance result, with or without the relevant organization (Kirton et al. 2010). A similar conclusion arises from recent work on the relationship between the G8 and G20 (Larionova and Kirton 2015).

This book thus offers the first analysis of the G8/G20-UN relationship in the field of climate change. It conducts a comprehensive, detailed exploration of the dynamics of how the G8/G20 and the UN interrelate. It does so in a changing context where new international institutions—PSIs as well as multilateral organizations—enter the field. It also highlights and develops an understanding of the dynamics of institutionally embedded regimes operating in cooperation and competition in an uncertain world to determine which will prevail (Raustiala and Victor 2004; Kirton 2013a). This book thus provides the first systematic account of leadership in global climate governance that properly puts the G8 and G20, in its relationship with the UN, at the centre.

The Argument

This book argues that the G8 created, retreated from, and returned with the new G20 to lead global climate change governance. It did so by inventing and later reinvigorating an effective, inclusive, equal, environment-first control regime that was very different than the failing, divided, inequitable, development-first UN one dominating from 1989 to 2004. This cadence of the creation, retreat, and return of G8 leadership in global climate governance was caused primarily by the shocks from energy and acid rain in the 1970s and extreme weather events since 2005, by the absence of UN climate governance in the 1970s and its increasing ineffectiveness since 2005, and by the growing globally predominant, internally equalizing capability of the G7 from 1975 to 1988 and the more inclusive G8 plus G5 since 2005 and G20 since 2008. Also important were the slow convergence of G8, G5, and G20 members

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on democratic principles, the political control, capital, commitment, competence, and civil society support of key G7 leaders, and the growth of the G8, G5, and G20 as cherished clubs at the hub of a network of global summit governance needed to protect all from their mounting vulnerability to the consequences of uncontrolled climate change.

The Phases of G8 Leadership

G8 leadership in global climate governance unfolded quite unevenly, through the three major phases of creation, retreat, and return, with distinct periods within each phase.

Creation, 1979–1988

The first phase, of creation from 1979 to 1988, saw the G7 invent an effective, inclusive, ambitious, environment-first control regime through its own direct, informal, voluntary action. It put the environment first by targeting climate change as a key condition in support of energy security, along with energy conservation, efficiency, and alternatives as key principles. It ambitiously set a carbon control target and timetable as zero increases immediately in carbon concentrations in the atmosphere. It included all consequential carbon-polluting powers in its actions, if not its institution, to meet this goal. It did so through informal but politically obligatory oil-import quotas and more comprehensive, bottom-up, sectoral actions by G7 members, and by bold economic and security measures to defeat the outside carbon powers of the Soviet Union and bloc and the major oil-producing emerging powers of the time. It proved effective in moving toward its goal, as the emissions of OECD members declined from 1979 to 1985, the emerging oil powers with their development-first demands for a New International Economic Order (NIEO) were defeated, and the Soviet Union and bloc were driven to the brink of collapse by 1988.

This phase of creation encompassed three distinct periods of G7 governance. The first was a period of invention from 1979 to 1984. During this time German chancellor Helmut Kohl, supported by America's Jimmy Carter and Canada's Joe Clark, led their colleagues at the 1979 Tokyo Summit to the consensus on stabilizing atmospheric carbon and sulphur concentrations immediately. They implemented this consensus at subsequent summits through more direct sectoral controls on G7 members in 1980–1981 and then resistance to the demands of the consequential carbon-intensive communist and emerging oil-rich countries from 1982 to 1984.

The second period saw a rediscovery from 1985 to 1986. At the second German-hosted Bonn Summit in 1985, the G7 returned to govern climate change directly and made its first precise, politically obligatory commitment on the subject, which members complied with well during the following year.

The third period featured a revival from 1987 to 1988. At their second Venice Summit in 1987, G7 leaders started their continuing deliberations on climate change. At Toronto in 1988, they expanded their climate agenda and called for the creation of the Intergovernmental Panel on Climate Change (IPCC).

Retreat, 1989–2004

The second phase, of retreat from 1989 to 1984, saw the G7 step back from direct global climate leadership of its own in favour of shaping and then supporting the emerging UN-centred regime. As it developed through the UNFCCC created in 1992 and its Kyoto Protocol produced in 1997, this alternative UN-centred regime increasingly became a divided,

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development-first, ineffective one. Despite the apparent equality for the environment and the economy contained in the name of the UN Conference on Environment and Development at Rio de Janeiro in June 1992, development came first, under the defining principle of sustainable development. Here environmentalists were given the conditioning adjective of ecologically "sustainable" while the developing countries and community were given the noun economic "development" as the central goal.

This UN regime offered a top-down approach featuring an overall global goal but initially set virtually no specific targets or timetables, let alone any goals sufficiently ambitious to control the steadily compounding carbon emissions and concentrations and the global warning they brought. Under the principle of common but differentiated responsibilities, it divided the world into a small group of developed countries that were obliged to control their emissions and a much larger group of developing countries that were not. The latter were thus left free and incentivized to develop in their prevailing, preferred carbon-intensive way. Employing a formal, legal, broadly multilateral convention-protocol approach, the UN regime began with generalities that were to be progressively but slowly developed into more specific measures at annual meetings of the members who had consented to join—a group that excluded from the precise Kyoto Protocol produced in 1997 the world's largest carbon polluter and power, then the United States as an operational carbon constrainer, and a China that assumed this position less than a decade hence. The result was an increasing failure to take the needed action, especially as the little group of countries that had agreed in 1997 to begin controlling their emissions by a little largely did not do so by 2004.

This phase of G7 retreat in favour of the UN and its alternative approach contained three distinct periods. The first was a reinvention from 1989 to 1992. Starting at its Paris Summit in 1989, where environmental subjects took up one third of the communiqué, the G7 did much through its increasing climate commitments to reinvent the regime for global climate governance by initially shaping and subsequently decisively supporting the creation of the compromised but acceptable alternative UN regime at UNCED in 1992.

The second period saw a reinforcement of the Rio regime from 1993 to 1997. The G7 reduced its attention to climate change but improved its members' compliance with their G7 climate commitments and increased its support for implementing the divided UN regime. This culminated at the June 1997 Denver Summit of the Eight, which helped create the UN's Kyoto Protocol in December of that year.

The third period featured a retreat from 1998 to 2004. This retreat came in two ways. First, G7 attention and commitments on climate change dropped to very low levels after the Kyoto Protocol arrived. Second, the G7 started to shift from simply supporting the UN regime to increasingly call for an inclusive one in which all carbon-producing and thus polluting powers controlled their carbon.

Return, 2005–2014

The third phase, of a return to direct G8-centred climate leadership from 2005 to 2014, saw the G8 shift from supporting the increasingly ineffective UN regime toward an enhanced version of its initial, inclusive, ambitious, environment-first, effective, G8-led regime. That regime now centred on informally agreed action by the G8, with its new, increasingly equal G5, MEM/MEF, and G20 partners in direct support. It put climate change as the central focus, whose control was backed by a broad array of environmental, energy, economic, and other measures. It ambitiously set a specific target and timetable of a temperature rise no greater than 2°C above pre-industrial levels and a 50 percent reduction in G8 greenhouse

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gases by 2050. Above all, it secured a consensus and partial commitment from all G5, MEM, and G20 powers that they would also control their carbon, with China in the lead. It again did so through informal but politically obligatory sectoral actions by all partners, contentiously but consensually agreed to at G8-centred summits expanding to eventually include as equals all the major carbon powers combined in the G20.

This evolving new regime promised to be effective. G8-wide and US greenhouse gas emissions declined each year since 2005. There was now hope that the newly constrained major emerging carbon powers and polluters would eventually follow this G8 and now G20 lead. In 2014, global carbon emissions dropped for the first time in 40 years without an economic downturn to help.

This return to the principles of a G8-led, inclusive regime, now including all G20 members, unfolded through four distinct periods. The first saw a restoration from 2005 to 2007 of the basic principles of the initial G7-led regime of 1979–1988, with the G5 powers of China, India, Brazil, South Africa, and Mexico now included at the G8 summits, starting at Gleneagles in 2005 and continuing through to Heiligendamm in 2007. These three years featured soaring summit attention to, priority for, and commitments on climate change, and the related development of global governance inside and outside the G8.

The second period involved reaching out from 2008 to 2009 beyond the G5 to bring the emerging powers of Korea, Indonesia, and Australia into the summit and regime. They were included along with the G5 powers as members equal to the G8 in the MEM, which was elevated to a summit in 2008 and renamed the MEF in 2009, and then in the new G20 summit, which started actively governing climate change in 2009. The G8's 2009 L'Aquila Summit saw the G8 give climate change the greatest attention, priority, and link to the G8's foundational democratic and human rights principles.

The third period saw the realization from 2010 to 2011 that the UN regime was failing. This was dramatically displayed by the shock of the disappointing COP-15 in Copenhagen in December 2009, the arrival of the ad hoc Copenhagen Accord cobbled together at the last minute there by the US, China, India, South Africa, and Brazil, and the entry of the G20 summit into global climate governance in a sustained, expanding way. The economically oriented G20 brought the vision of a green economy into essential support of climate change control. The UN's stunning Copenhagen failure brought reduced but still robust G8 climate governance at Muskoka in 2010 and Deauville in 2011, while that of the G20 rose amidst a new financial crisis erupting in Europe at Toronto in June 2010, Seoul in November 2010, and Cannes in November 2011.

The fourth period featured the increasing replacement from 2012 to 2014 of the principles and leadership of the old divided UN regime by the new inclusive, expanded, equal, G8- and G20-centred one as the dominant centre of global governance on climate change. This process of replacement first saw the G20 emerge alongside and then ahead of the G8 as the PSI leader on climate change control. It then saw the G8 replaced by the G7 alone at its summit in 2014, as Russia's invasion and annexation of the Crimean region of Ukraine disrupted but did not delay the G7's revival of climate leadership, arising on the way to the landmark COP meeting to replace the Kyoto regime in Paris in December 2015. As 2015 began, the inherited divided UN regime was steadily being replaced in principle and practice by the inclusive, expanded, equal G8- and G20-led one.

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The Causes of G8 Leadership

This three-phase cadence of G8 and then G20 climate governance—from creation through retreat to return—was driven largely by the six causes highlighted by the concert equality model of G8 governance and the one cause added by the systemic hub model of G20 governance (Kirton 1989, 1993, 2013a).

According to the concert equality model, awareness of the vulnerability of major powers is activated by intensifying new nonstate shocks that cannot be controlled through unilateral actions taken by the major powers or by the old multilateral organizations that they control. Their leaders thus mobilize their globally predominant powers through balanced bargains among equals to respond, on the basis of shared core principles. They can also secure the consent of their domestic polities to invent and agree on appropriate responses with their powerful colleagues in their increasingly cherished, compact summit clubs. The expanded model of systemic club governance adds that the leaders' personal summit club increasingly acts as the hub of a network of global systemic governance that spreads their influence to produce effective, legitimate global governance as a whole.

Shock-Activated Vulnerability

The first cause was shock-activated vulnerability, specifically the cluster, sequence, and size of shocks on the same and similar subjects that showed all G8 and then G20 members, especially the most powerful United States and the major emerging powers led by China, their equalizing vulnerability to the destructive, deadly, and even possibly existential new threat of climate change (Kirton 2004a, 1993). Such shocks, defined generally by surprise, sudden eruption, and threat, create the new issues, crises, and uncertainty that lead states to choose informal intergovernmental organizations to respond and lead these organizations to perform well (Vabulas and Snidal 2013). These shocks came in three categories.

The first category contained shocks with the same content as climate change and its major component of global warming. These most clearly took the form of abnormally severe and persistent heat waves and droughts that produced warming felt directly by many humans and caused visible destruction, particularly to agriculture and food, and death to humans through malnutrition and dehydration and other direct health impacts.

The second category comprised shocks similar in content and closely causally connected to climate change, but requiring cognitive, social, and political construction by G8 leaders and publics to forge the causal link between the content of the shock and its climate change cause, consequence, and required control response. Such shocks included visible, destructive, and deadly extreme weather events such as hurricanes, tsunamis, typhoons, floods, storm surges, and other sudden sea-level rises. They extended to oil-price spikes and abrupt supply cut-offs, oil spills from tankers and drilling rigs, nuclear reactor accidents that suddenly transmitted deadly particles through the atmosphere around the world, and the acid rain from coal burning and transportation that produced visibly denuded forests and dead lakes.

The third category consisted of shocks quite different in content from climate change, at least before the causal complexities were comprehended and the range of uncertainty reduced. They included war, revolution, terrorism, financial and economic crisis, and acute outbreak events in health. Such shocks tended to divert G8 leaders' immediate attention from climate change toward these other visibly urgent concerns. But they could also enhance the G8 and G20 clubs' general cumulative institutional and interpersonal solidarity in ways that made agreement easier in all issue areas, including climate change. They

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could also bring semi-intended and recognized benefits for climate change control, such as the widely applauded swift, large-scale end of the Soviet Union, Soviet bloc, Soviet system, and Soviet ideology after 1989, and the widely reduced economic growth after the economic and financial crises in 1979, 1997, and 2008. Such crises could be mobilized by influential agents through new cognitive constructions for climate change control, such as with the G20's post-2008 emphasis on creating green growth.

Such dramatic shocks politically activated in politicians, elites, and publics the awareness of the vulnerability of people, property, nature, and other valued things. This activation was more likely to come from subsequent shocks with the same content or similar content to the initial or previous ones, even if they might now be smaller in size, scale, or scope. The memory of the death and destruction caused by the earlier shock, and the failure of the traditional policy approaches in response, meant that subsequent shocks spurred increasingly sensitized, usually slow-learning G8 leaders and supportive publics to take faster, more ambitious, innovative action. This was especially the case if the shocks struck their own, highly capable countries with the destruction and death that demonstrated how vulnerable they now were to such new, nonstate security threats—those unintended, untargeted threats brought by nonstate or even non-human actors that flowed often unpredictably from anywhere to anywhere through pathways that no one fully understood. Climate change was a classic case (Kirton 1993).

Such vulnerability was usually a chronic and less visible but still potentially costly condition, as was the growing sensitivity to globalization and interdependence on which this vulnerability partly rested (Keohane and Nye 1977). Among the leading same- or similar-subject vulnerabilities spurring global climate governance were the acid rain that was transmitted through the atmosphere across international borders to create visibly denuded and dead trees and dead fish, and the smog that visibly choked cities and killed citizens in capitals such as Beijing. Beyond lay the full array of greenhouse gas emissions, sequestrations, and concentrations largely invisible to the naked eye and thus reliant on scientific instruments, satellites, authoritative consensual knowledge, and visual media such as television to be rendered credibly real.

Thus the first phase of G8 climate leadership—the creation of its inclusive regime from 1979 to 1988—was driven by the oil supply, price, and tanker spill shocks of 1979, following those from 1973, the famine in Africa, the nuclear explosion at Three Mile Island in the US in 1979, and the visible vulnerability of European and North American trees and lakes to acid rain. The shock of the Soviet invasion of Afghanistan at the end of 1979 and the ensuing new cold war soon diverted G7 attention but brought carbon-reducing benefits from a global economy in decline, until the 1985 Bonn Summit linked the two subjects. Then the deadly heat wave afflicting the US in the summer of 1988 led the G7's Toronto Summit to have the G8 govern climate change ever since.

The following 15 years from 1989 to 2004 brought a G8 retreat to support the UN regime. This was due to the diversionary if positive shocks of the Cold War victory bringing a democratizing Russia into the G8, the absence of serious oil shocks with sustained effects, and effective action on acid rain. Also important were the diversionary shocks of the Asian-turned-global financial crisis from 1997 to 2002 and the al Qaeda terrorist attack on the US on September 11, 2001. The short-lived oil spike brought by the 1990–1991 Gulf War and the 1986 Chernobyl nuclear explosion were insufficient to overcome G8 confidence that the UN had the formula and time to slowly produce an effective, if divided, development-first climate change control regime.

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From 2005 to 2014, the return of inclusive, now expanded G8-led and then G20-led climate governance was driven by the cadence of increasingly severe and widespread climate shocks. These had begun with deadly heat waves in France, elsewhere in Europe, and in India, as well as the Asian tsunami in late December 2004, rising oil prices, Hurricane Katrina afflicting the US in late August 2005, and, as solidarity-creating diversionary shocks, the rising post-September 11 terrorist attacks including the attack in London as the UK hosted the Gleneagles Summit on July 7, 2005.

Multilateral Organizational Failure

The second cause of the G8-centred creation, retreat, and return of global leadership on climate change was the recurrent failure of the multilateral organizations emerging from the 1940s UN system to control a climate change problem that was becoming cumulatively worse and approaching critical thresholds by 2005.

Constant core constraints came from the presence of the economically devoted IMF and World Bank as the pre-eminent multilateral organizations of the post-World War II order, the absence of any recognition of the existence or value of the natural environment in the 1945 UN charter, and the lack of a functional UN organization dedicated to environmental protection or energy as the World Health Organization was for health (Biermann and Bauer 2005; Lesage et al. 2010) The failure of the World Meteorological Organization from 1950 and UNEP born in 1972 to take up climate change control at the political or leaders' level left the G7 to create global climate governance from 1979 to 1988. A G7 that trusted the UN then helped create, shape, and support the IPCC after 1989, the UNFCCC's COP in 1992, the Kyoto Protocol's Meeting of the Parties (MOP) in 1997, the UNFCCC Secretariat in Bonn, and the UN sustainable development summits in 1992, 1997, and 2002. This UN action led the G8 to retreat to support the UN and its divided, development-first regime, shaped by international institutions where the developing country majority was decisive. Only with the evident failure of this UN regime by 2005, peaking at the Copenhagen COP in 2009, did the G8 return to lead with its own expanded, inclusive, equal regime. It did so first with the Gleneagles Plus Five in 2005, then the MEM/MEF summits in 2008–2009 and finally the G20 summits in 2009–2013. These new PSIs containing all the major carbon-producing powers, ultimately as equal members, allowed for the emergence and effectiveness of the new G8-led, expanded, inclusive, equal regime. They also provided direct solutions, as on phasing out fossil fuel subsidies and shaping the new UN-beyond-Kyoto regime due to arrive in December 2015.

Predominant Equalizing Capability

The third cause of the G8-centred creation, retreat, and return of global climate leadership was the changing configuration of globally predominant and internal equality in capability of a G7 and then G8, expanding into a G20. During the creation of its own inclusive climate regime from 1979 to 1988, the G7 had considerable global predominance and substantial internal equality among its members, especially with the outside communist and developing world in relative decline after 1979. From 1989 to 2004, when the G8 retreated to let the UN lead, the G8's global predominance and internal equality slowly declined, as the strong, sustained rise in relative capability of the G5 powers increasingly overwhelmed the G7's addition of Russia in 1998, the earlier unification of Germany, and the periodic expansion of the European Union (Kirton 2013a). From 2005 to 2014, that strong relative capability rise of the G5, as well as other MEM/MEF and G20 powers, and the G8's growing success in incorporating them as peers in an enlarged summit group allowed the G8, now with the

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G20, to return to global climate leadership with its expanded, inclusive, equal, environment-first regime.

Common Principles

The fourth cause of the creation, retreat, and return of G8 climate leadership was the changing democratic convergence of the G7 and G8 plus members. The all-democratic G7 pioneered global climate governance from 1979 to 1988. Then, with post-Cold War globalization creating a more politically open global community and the G7 slowly incorporating a reforming Russia into a now slightly less democratic G8, an optimistic G7 was content to leave global climate leadership to the more multilateral UN, now more democratically like-minded than in the earlier confrontational Cold War–NIEO years. After 2005, the democratic dominance of the expanded G8 plus G5, MEM/MEF, and G20 allowed the G8 to return to expanded, inclusive, equal global leadership, even with the constraints of a still communist China, authoritarian Saudi Arabia, and recidivist Russia in 2014.

Political Cohesion

The fifth cause of the G8-centred creation, retreat, and return of climate leadership was the changing domestic political cohesion of members. This cohesion was composed of the leaders' political control, capital, and public support or pressure, and their personal continuity, competence, and convictions about climate change. The creation from 1979 to 1988 was brought by the domestic political dominance, personal convictions, public support, and G7 experience of co-founder Helmut Schmidt of Germany, and continued by his successor Helmut Kohl at Bonn in 1985 and beyond. Necessary support came from Canada's Joe Clark, America's Jimmy Carter, and Britain's Margaret Thatcher, with expertise in chemistry, and Europeans pushed by Green parties, in Germany above all. During the G8's retreat from 1989 to 2004, new leaders with limited convictions about the need to control climate change arrived in Britain under John Major, Russia under Boris Yeltsin and Vladimir Putin, Japan under Junichiro Koizumi, and the US under George H. Bush from 1989 to 1992 and, above all, George W. Bush from 2001 to 2004. From 2005 to 2014, the return of climate leadership was fuelled by Britain's re-elected Tony Blair in 2005, Germany's Angela Merkel (a physicist who had served as Kohl's environment minister before assuming the chancellorship in 2005), Barack Obama as US president since 2009, his supportive G20 colleagues from Korea and Mexico, and China's new president Xi Jinping.

Constricted, Controlled Participation in a Club at the Network Hub

The sixth cause of this cadence of G8 creation, retreat, and return was the changing constricted, controlled participation within the G8 and then G20 club, operating at the hub of a growing network of global summit governance for a globalized world. The G7 created global climate governance from 1979 to 1988 when it was a compact club of initially six members that added an environmentally committed and competent Canada in 1976 and the EU in 1977. Its leaders stood at the hub of a network of global PSI governance including the summits of the Commonwealth, NATO, and La Francophonie after 1985. The retreat in favour of UN leadership from 1988 to 2004 coincided with the G7's increasing inclusion of the Soviet Union and then Russia, followed by a growing, changing array of invited countries and multilateral organizations in 1996 and from 2001 on, even if the surrounding network of PSIs rapidly increased in those post-Cold War years. The G8's return to climate

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leadership was caused by its continuing but carefully controlled expansion to the G5, then MEM/MEF, and, finally, the still constricted G20 with a constant membership from 2008 to 2014.

The Outline

To develop this argument, this book proceeds as follows. Part II, "Creating the Exclusive G7 Regime," covers the first phase of creation from 1979 to 1988. Chapter 2, "Invention, 1979–1984," examines the G7's invention of global climate governance in 1979, when it called for an end to increases of carbon concentrations in the atmosphere, and its follow-up in the years to 1984. Chapter 3, "Rediscovery, 1985–1986," focuses on the rediscovery of climate change in 1985 and its follow-up in 1986. Chapter 4, "Revival, 1987–1988," explores the surge of G7 global climate leadership that started to create what became the successor and ultimately different UN-led regime.

Part III, "Retreating to Support the Divided UN Regime," covers phase two from 1989 to 2004. Chapter 5, "Reinvention, 1989–1992" examines the G7's initial post-Cold War surge to create the UN regime at UNCED in Rio de Janeiro in 1992. Chapter 6, "Reinforcement, 1993–1997," charts the G7's full retreat and shift to support the global climate leadership of the UN, its UNFCCC, and its Kyoto Protocol in 1997. Chapter 7, "Retreat, 1998–2004," examines this retreat through to the near death of G8 climate governance at George W. Bush's Sea Island Summit in 2004.

Part IV, "Pioneering the Inclusive Global Regime," covers phase three from 2005 to 2014. Chapter 8, "Restoration, 2005–07," explores the increasing return of the basic principles of the initial G7-led regime, now with the G5 powers included as regular participants at the expanded G8 summits, Gleneagles in 2005, St. Petersburg in 2006, and Heiligendamm in 2007. Chapter 9, "Reaching Out, 2008–2009," examines how the G8 brought first the G5, then the emerging powers of Korea, Indonesia, and Australia, and, finally, Saudi Arabia, Turkey, and Argentina into the expanded regime as equals, under the new MEM and G20 summits in 2008. Chapter 10, "Realization, 2009–10," shows how the shock of the failure of the UN and the ad hoc Copenhagen Accord in December 2009 was followed by reduced but still robust climate governance by the G8 at Muskoka in 2010 and Deauville in 2011, and increasingly by the G20 at Toronto in June 2010, Seoul in November 2010, and Deauville in November 2011. Chapter 11, "Replacement 2012–14," shows how the old, divided UN regime was slowly but steadily being superseded by the new inclusive, environment-first, G8-centred one, coming from the G20 as the emerging dominant centre of global governance on climate change.

Part V, "Conclusion," contains Chapter 12, which summarizes the key arguments in this analysis and connects the three-phase cadence of G8 climate leadership to the six causes of the revised concert equality model. It does so by quantitatively relating changes in the causes to those in the six dimensions of G8 and G20 summit performance. It also suggests the prospects and possibilities for global climate governance in the years ahead.

Methods and Materials

This analysis of G8- and G20-centred leadership on climate change follows a multi-method approach. For each G8 and G20 summit it engages, insofar as possible, in detailed process

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tracing to show how the host planned and prepared the summit and how the members and participants arrived at, advanced, and adjusted their positions in the lead-up to and at the summit, as well as the major achievements that the summit produced. It also employs input-output matching through a more systematic quantitative analysis of the six major dimensions of performance at each summit: domestic political management, deliberation, direction setting, decision making, delivery through compliance with and implementation of the commitments, and the development of global governance both inside the G8-G20 and outside, above all at the UN and multilateral organizations as a whole.

In general, in evaluating a summit's overall performance, as the years covered in this study unfold, greater emphasis is placed on the subsequent sequence of six dimensions of performance, with delivery privileged throughout. The performance on these dimensions and the outcomes of the process tracing are related to the condition at the time of the six major causes of the concert equality model of G8 governance, with its supplement from the systemic hub model of G20 governance. The causes shared by both models—starting with shock-activated vulnerability—are considered the most salient, but with compact club cohesion acquiring more salience in the later years, and individual leadership a critical component throughout. The result is a compact model of six effects (the performance dimensions) and six causes (of the concert equality/systemic hub models) assessed against 49 G7/8 and G20 summits over 40 years. It provides the best available account of how the political complex adaptive system of G8-G20 summitry governed the physical complex adaptive system of climate change.

To identify the impact of G7/8 and G20 governance on the broader UN-based multilateral system and regime, and the reverse influence flows that followed, this study relies on input-output matching. It shows in particular how principles and proposals first adopted at the leaders' level in the G7/8 and G20 were subsequently accepted collectively by leaders and ministers in their climate-relevant meetings at the UN, if often with some delay, in less detail, and in a distinctive form. It largely does not trace the process of how G7/8 and G20 members individually and collectively operated within the UN to produce this broader change. Other scholars have now begun to do so in the case of the G20 (Brenton 2013; Happaerts 2015; Karlsson-Vinkhuyzen and McGee 2013; Terhalle and Depledge 2013). Nonetheless, this initial process-tracing scholarship and the input-output matching conducted for this book are sufficient to support the bold claims that it makes. But there is much left for scholars and others to do, to close this important causal gap.

The materials for this study, particularly the detailed process tracing of G7/8 and G20 summitry, come from scholarly works on the G8, G20, and global governance of climate change, publications by and autobiographies and biographies of G8 and G20 participants, policy commentaries, newspaper and other media accounts, and the documents in the archives of the G8 Research Group and G20 Research Group at the John Graham Library at Trinity College in the University of Toronto. In addition, this study draws on extensive private interviews, conversations, participation in policy dialogues, and discussions of drafts with key G8 and G20 participants, from the leaders' level on down, embracing those from all members of the G8 and almost all members of the G20. John J. Kirton has had several hundred such encounters with G8 participants since 1977 and more than a hundred with G20 participants since 1999. Ella Kokotsis has conducted dozens more, primarily from 1995 to 1997. Kirton and Kokotsis have attended virtually all G8 and G20 summits since 1988, serving as accredited members of the media to cover the event, attend the briefings and scrums, and access the materials available only at the event. The quantitative evidence on the dimensions and causes of summit performance, including the extensive

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data set on compliance, have been largely assembled since 1988 by the researchers, research assistants, and members of the G8 Research Group and G20 Research Group. These continually improving data sets are available at the G8 Information Centre.[2]

The Issue Area of Climate Change

For this study, focused on the international institutional context of the G8, G20, and UN, the issue area of climate change includes climate change itself, greenhouse gases, global warming, the UNFCCC and Kyoto Protocol, and carbon emissions. It includes the Global Environment Facility (because one of its six main functions is to provide grants for climate change projects in developing countries). It includes sustainable development (because the UN defines climate change as falling within the scope of sustainable development). It usually excludes energy, energy efficiency, clean energy, nuclear energy, or alternative energy in general, unless they are linked to climate change adaptation, mitigation, or risk.

The concept of leadership used in this volume is the classic one advanced by Oran Young (1991), embracing structural, directional, and idea-based leadership (Underdal 1994; Carin and Mehlenbacher 2010b; Karlsson et al. 2012). The concept of regime employed, expressed in the six dimensions of performance, is based on the classic one codified by Stephen Krasner (1983, 2) as "implicit or explicit principles, norms, rules, and decision-making procedures around which actors' expectations converge in a given area." It adds the subsequent recognition that issue areas such as climate change are constructed, not given, that expectations matter primarily when they lead to action, and that decision-making procedures include the creation of international institutions within which regimes are embedded, operated, and creatively changed.

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2 Data sets on the G8 and G20 are available at the G8 Information Centre at http://www.g8.utoronto.ca, which also contains an index of the G8 and G20 archives housed at the John Graham Library at Trinity College in the University of Toronto.

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