Research Report

G8 Climate Governance, 1975-2007

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Introduction

Significance

Climate change has increasingly become an important global issue in recent years. However, climate change had appeared on the Group of Eight (G8) agenda as early as 1979, when G8 leaders came to a consensus on the need to halt growth of CO2 concentrations in the atmosphere right away (G8 1979). This was the same year that the U.S. National Academy of Sciences declared that there was "no reason to doubt" the existence of climate change (Bodansky 2001: 24). At that time, the G8 climate consensus was the most ambitious to be arrived at internationally, and the G8 managed to comply with this commitment for the following five years.

This early G8 initiative on climate change stands in sharp contrast to the non-existent climate policy agenda within the United Nations system of institutions. By the time the United Nations General Assembly first noted the problem of climate change almost a decade later in December 1988, the G8 had already addressed climate at its Tokyo 1979, Bonn 1985, Venice 1987, and Toronto 1988 summits. At the Toronto summit, the leaders of the G8 countries called for a protocol on emissions of nitrogen oxides and the establishment of an intergovernmental panel on climate change under UN auspices.

The G8 continued its commitment to climate change mitigation at subsequent summits. Climate change also began to increase in importance on the UN agenda, culminating with the creation of the Kyoto Protocol for greenhouse gases in 1997 under the United Nations Framework Convention on Climate Change (UNFCCC) of 1992. However, United Nations climate governance has proved weak and the Kyoto protocol is no exception. Many countries are not on target to meet their emissions reductions and the world's greatest emitter, the United States, has refused to ratify the protocol.

G8 climate governance is therefore of vital importance as the UN system fails to reign in top emitters effectively, even as the accumulating scientific evidence suggests uncontrolled climate change is an urgent, even existential threat. The G8 role will only become more important as the deadline of 2012 to establish a post-Kyoto climate control regime draws closer. As the architecture of this regime is debated, some scholars and even policy-makers such as US President Barack Obama are endorsing smaller, more plurilateral forums for climate change leadership. They feel the international system needs a strong climate control regime, one not plagued by ineffectiveness due to the broad but shallow and unbalanced consensus created by a large number of states with differing interests. Also a new regime must be one under which the United States and the world's other major emitters led by China are willing to accept significant carbon-reducing controls.

Yet despite this pioneering start in 1979, G8 climate governance has not been one of continuous, ever increasing success. Rather it has exhibited a three stage pattern of G8 effectiveness on

climate change in the early eighties, declining effectiveness in the late eighties and 1990s, and revived effectiveness into the 21st century?

The Scholarly Debate

Scholars' views of the G8's performance with regard to climate change vary widely from criticism to compliments of the G8's intention, focus, and actions (or lack thereof) in its attempt to mitigate climate change and the causes that lie behind. More recently, many scholars have given differing opinions of where the G8 and the G8+5 emerging economies (Brazil, China, India, Mexico, and South Africa) fit into generating and guiding a post-Kyoto international climate change regime.

The first school of thought, focused on domestic political management and deliberation, sees **domestically oriented deliberation and delegation.** Bayne (2000), the major scholar in this school, asserts that at the leaders' level, discussion of certain issues (including climate change) are only on the agenda to bolster the domestic positions of G8 leaders. Beyond discussions, all remaining tasks such as implementation are handed down to the ministerial or official level.

The second school, focused on principled and normative direction-setting, sees the G8 creating a climate change regime with negative consequences for the environment. This idea of the G8 driven by **ecologically destructive neoliberalism,** offered by Stephen Gill (2000), argues that the current trend of disciplinary neoliberalism, with domestic privatization and deregulation with a view towards more open trade, is ecologically destructive. It creates "a crisis that is ecological as well as social." (Gill 2000)

A third somewhat similar school, that of Stephen Bernstein (2000, 2001), argues that the G8 upholds the 1972 UNEP values of ecologically endangering **liberal environmentalism**. The G8 has adopted the liberal market-friendly approach to climate change, choosing policies such as polluter pays. This use of "economic instruments for environmental protection" in Bernstein's eyes is a policy which is potentially harmful to the environment. Instead, he endorses a sustainable development view involving aid to developed countries as better suited to the task of tackling climate change. A variant of this school comes from José Goldemburg (2007), who argues that the G8 endorses market-based mitigation strategies.

The fourth school, in contrast, argues that the G8 has taken the 1945 embedded liberalism and infused **embedded ecologism** into its central tenets (Kirton 2002). Even though there have been brief periods throughout the G8's history where trade and the economy were higher priorities, since 1996 the G8 has regained its commitment to environmental protection and trade liberalization as a means to that end. Takashi Hattori (2007) argues in a similar vein that Japanese leadership on climate change both at the UNFCCC Conference of the Parties (COP) and the G8 was born out of its participation at the 1998 and 2005 G8 summits.

A fifth "wrong decision" school, focused on decision making through commitments, believes the G8 has supported and perpetuated an **inappropriate target and timetable mitigation scheme**. Chris Green (2008) criticizes the G8's choice at the 2005 Gleneagles summit of a target of 50% emissions reduction by 2050. He asserts that the Kyoto Protocol has led to the target system having a "life of its own." He also points to political pressure to create a new, post-Kyoto framework as pushing the G8 further towards the improper choice of targets for climate change mitigation. Green feels that concrete action on climate change is needed now rather than by setting distant targets that will not be met.

The sixth school, focused on delivery through compliance with commitments, is that of **institutionalized international interdependence**. Kokotsis (1999), the major scholar within this school, sees growing commitments and compliance in climate change and biodiversity as a result of cooperation with the increasingly important UN climate change institutions, G8 environmental institutions, and domestic environmental ministries of member governments. The leaders-level delegations within the G8 are also a source of political capital driving G8 climate governance.

The seventh school, focused on delivery and the development of G8 governance, sees ambitious and increasing G8 global environmental direction-setting and decision-making but without proper implementation measures. This makes the G8 an informal **implementation failure**. James Barnes (1994) argues that implementation is not properly enforced because of a lack of a secretariat, each G8 presidency having its own idiosyncratic, non-iterative agenda, and a G8 assignment of tasks to the World Bank and the IMF which the G8 fails to review or monitor afterwards.

An eighth school, focused on the development of global governance more generally, argues that the G8 is a **UN generator and fallback governor.** James Sebenius (1991) argues that the G8 called for the UN's framework convention in 1990, two years after climate change appeared on the UN General Assembly's agenda. However, if the UN were to fail, Sebenius points to the possibility that a smaller, more flexible group of major industrial states could take the place of the United Nations in leading international climate governance.

A ninth, similar school sees the G8 more recently as a **superfluous UN supporter**, meraly endorsing a well functioning supporting the UN as the appropriate forum for post-Kyoto climate change negotiations. Aldy and Stavins (2008) point out that at the 2007 G8 summit in Germany, the G8 supported the continuation of the UN approach to climate change once the Kyoto Protocol expires in 2012. Soledad Aguilar (2007) points out that the G8 supported the UN as the appropriate post-Kyoto institution to govern climate change mitigation. He also argues that the G8 made little headway of its own on climate change, suggesting that support for the current UN system negates the need for autonomous action on the part of the G8.

A tenth school argues that the G8's effective **informal plurilateral governance** is the right formula for successful international negotiations on climate change. Thomas Schelling (2002) argues that the G8's informal system draws members in more fully, especially the United States, because they are willing to accept the fewer restrictions from a soft law body. George Kennan (1970) also argues for a smaller, more flexible group of industrialized states to create an effective global environmental regime. Peter Haas (2002) similarly suggests that the G8 is an effective environmental leader because of its small size, frequent meetings and focus on national interests. Haas (2008) more recently argues that the G8+5 has seen effective cooperation in mitigation technology because success in this area is most likely to be "sustained in most of the major industrial and industrialized countries." This is because cooperation on technology reduces vulnerability to expensive and unreliable fuel sources and creates new "green markets." A study by Manfred Milinski et. al. (2008), designed to discover which types of groups are most successful in cooperation on climate change, found that smaller, non-anonymous groups were better for preserving a common good. They pointed to the G8 as being an international body with these characteristics.

The eleventh school prescriptively sees the G8 as a **blueprint and basis for new climate governance.** Its scholars see the G8 as the model from which to build a new body of international climate governance, through either the creation of an entirely new institution or a reformation of the old. Hilary Clinton (2007) advocates the creation of an **"E8"**, linking the International Energy

Agency (IEA), China and India, "modeled on the G8" to deal with adaptation to climate change. David Victor (2006) states that the current G8 **is inadequate to create real cooperation** on climate change due to too few members and its non-inclusive membership. However, if the G8 were reformed to become more inclusive (including emerging states such as China and India) in its membership, it could see greater cooperation on climate change. Barack Obama (2007) has also called for climate change leadership in the form of a **reformed G8** including new members.

A twelfth and final school sees the G8 as a source for **optimistic political leadership**. Ruth Greenspan Bell (2006) brings a contrast to the pessimistic view of climate change experts. In her view the G8 creates political will within the system for deliberations and delivery on climate change issues.

Puzzles

Although the schools of thought and the scholars within them cover a wide range of aspects of G8 climate governance, they leave much to be desired in terms of providing a complete and elegant descriptively accurate and causally compelling account. None of these schools offer a comprehensive let alone detailed description of how the G8 has governed climate over the three decades since it started in 1979. None offer a discussion or explanation for the three phase pattern of G8 climate governance: first and far-reaching from 1979 to 1990, low and left to the UN from 1991 to 2004, and growing G8 governance on its own since 2005. This study offers the first such comprehensive, disciplined, detailed descriptive account of G8 climate governance and one that highlights the key phases and turning points.

Few of the schools and their authors explicitly identify what has caused the G8 governance they observe. None offer a parsimonious, logically coherent cluster of causes that drive the observed effects. Some scholars, such as Aldy and Stavins, and Goldemburg offer no causal claims at all. Many of those scholars who do so, such as Bayne, Aguilar, and Bell, only cite one cause. In an issue area as complex as climate change and with such a varied number of leaders' views, G8 member governments and societies, international institutions and global forces, there is good reason to believe that climate change actions within the G8 could be driven by a number of causes at all levels of analysis.

This leads to a second problem with the current schools of thought on G8 climate governance. All schools focus on different components of the G8 summits' climate governance in addressing causes and effects. Aldy and Stavins, Sebenius, Shelling, Bell and Green treat the G8 as a single unit within the international system, either in the decisions they make in governing climate change or, in the case of UN support, the other international institutions they associate and collaborate with. Other scholars such as Bayne focus on the individual level, how the personal opinions of leaders affect the deliberations within the G8 system. Bayne identifies the leaders' desire for re-election as the cause behind the weakness of deliberations at that level. Some scholars focus on the particular administration in G8 member governments. Berstein argues that the "administration under Ronald Reagan appeared to see little or no difference between environmental protection and the free market." Kokotsis perhaps comes closest to considering all levels of analysis with her claims that the international level (G8 institutions and UN international institutions), the domestic level (G8 member governments), and the individual level (leaders) all have an effect on G8 climate governance.

Third, not all of the scholars fit well within general models of G8 governance and theories of international relations. Bernstein and Gill's theories fit well with the broader model of group hegemony and theory of international liberalism. They cover its environmental manifestation and

its possible negative consequences. Schelling and Kennan's models of flexible global governance fit well within the theories of hard and soft law international institutions. They apply a positive value to the more flexible soft law institutions within the climate change issue. However, many scholars do not fit into any broader international relations theory. For example Green calls for action over targets, but makes no attempt to frame his analysis within a theory of the international order, such as liberal institutionalist legalization with its emphasis on precision, obligation, and delegation (Abbott et. al. 2000) Aguilar and Aldy and Stavins give no reference to the wider international system or even the relationship between plurilateral and multilateral institutions in their analysis of G8 support for the United Nations.

Another area that the schools of thought do not fully cover is the record of compliance of G8 climate change commitments. This is a crucial measure of the effectiveness of the institution. Compliance analysis gives insight into whether or not the G8 is a true climate leader over other institutions such as the United Nations.

Thesis

Using the record of G8 climate change commitments and compliance in particular, and causes from the international, domestic, and individual levels of analysis this study argues that G8 climate governance has unfolded in three stages. These stages are early extreme effectiveness in the early 1980s, a drop in effectiveness in the early 1990s, and a revived effectiveness since 2003.

This pattern is the result of three key causes. The first is the degree and success of UN governance in climate change. The UN was not yet active in climate change during the first phase of high G8 effectiveness. As the UN became more active on the issue of climate change with the creation of the Brundtland Commission, the Intergovernmental Panel on Climate Change (IPCC), the United Nations Framework Convention on Climate Change (UNFCCC), and Kyoto Protocol the G8 conceded to the UN system as the appropriate institution to deal with climate change. However, after 2003 when the UN's Kyoto regime with its unbalanced convention-protocol, target-timetable approach failed to reign in top emitters such as the United States and China and many ratified countries failed to meet their control targets under the Kyoto Protocol, the G8 became increasingly involved and effective in the area of climate change.

The second cause is the G8's inclusion of the most relevant powers on both the sources and sinks side. During the first phase of climate governance the G8 was able to include all relevant climate actors, including the US, effectively in climate deliberations. This is because of the small, flexible nature of the G8, and the G8 nations' status as the world's top emitters of the time period in both sources and sinks. During the second phase, however, the G8 was ineffective in constraining top emitters and absorbers, with their unchanging interests and preferences, by conceding to the hard-law nature of the United Nations which the United States was unwilling to follow, and failing to bring the South's largest emitters into the climate change dialogue. This created a 10 year lag in effective G8 climate governance, as emerging economies in the South began to reach G8 C02 emissions levels in the mid 1990s. However, the G8 did manage to include and increasingly constrain Russia, a top emitter and highly forested nation especially after 1997. During the third stage, the G8 was able to constrain the top emitters including the United States. This was first by the allure of its soft law practices over that of the UN, but centrally by the actions of Jacques Chirac in 2003 and especially Prime Minister Tony Blair, with climate change at the top of his agenda, to bring the rising outreach five and later MEM-16 and the United States into the climate deliberations at the Gleneagles summit in 2005 and develop with them an alternative and more appropriate global climate governance regime.

Another cause of this three phase pattern can be attributed to equalizing vulnerability within the G8 nations. Shock activated vulnerability starting with oil price shocks and later extending to extreme climate change related weather events provided the catalytic impetus for various climate change deliberations and commitments throughout the G8's history

Below the international level there are also a number of explanations for the record of G8 climate governance. At the leader and national level, the agendas of specific hosts and the varying priority placed on climate change by G8 nations were influential in the governance on climate change from summit to summit.

An Overview of G8 Climate Governance

Overall assessment

Bayne Grades

When comparing the grading of the annual summits, there seems to be some link between years of high deliberation for climate change and high environment Bayne scores. However, this does not seem to be the case with Bayne energy scores. Paris 1989 was the only summit to receive a grade specifically for the environment, B+. This summit was indeed a peak year for climate change deliberations, unsurpassed until the great leap forward for climate change at Gleneagles in 2005 (see Appendix A). If we look further at Bayne's energy scores, we see that the 1977 London summit received a B-, and the Bonn summit in 1978 received an A, but climate was not discussed at either summit. However, the 1979 summit, where climate change was first brought to the G8 agenda via a climate-energy connection, received a B+ from Bayne in the area of energy. The following year, when climate change was missing only a year after its first appearance, the summit received an energy score of C-.

The G8 Research Group Annual Performance Assessments

The annual assessments of the G8 Research Group of the performance of the Summit in the area of the environment shows a pattern of strong G8 environmental since 1996, dropping in 1999 and 2004. Environmental performance surpassed the overall summit performance in 1996, 2001, 2002, and 2003. This suggests rising strength in environmental performance in the 21st century in non-USA host countries.

Domestic Political Management

Communiqué Complements

Communiqué complements from the G8 summits can shed light on what members felt was important domestically, and pushed to get admitted into the communiqué. There are no communiqué complements in the area of climate change until the 2002 Genoa summit, where Russia's efforts to convene a global conference on climate change in 2003 was noted.

There were no further communiqué complements on climate change until the 2007 Heiligendamm summit. It mentioned Japan and +5 member Mexico for agreeing to host and hosting climate change dialogue meetings. Also in 2007, there was a complement given to the United States for hosting the MEM 16, and a complement directed at Canada, Japan, and the EU for deciding on a 50% reduction in greenhouse gas emissions by 2050.

The overall pattern shown by this limited communiqué complement data shows an increasing number of climate related communiqué complements, with a sudden 2007 surge widening the range of states complemented. The complements become increasingly inclusive, mentioning O5 powers such as Mexico. There was an absence of such complements in 2008.

National Policy Addresses

National policy addresses which have mentioned G8 and climate change include the coastal island states of the United Kingdom and Japan, and transcontinental Canada The United Kingdom came first by mentioning climate in a G8 context in 2004, 2005, and three times in 2007. Japan in 2007 mentioned climate in a G8 context once. So did Canada at a speech from the throne in 2007. Japan mentioned climate in a G8 context once in 2008. This confirms the 2007 surge, but one now sustained in 2008 in the host. It also points to an existential geophysical territorial driver of climate priority for G8 members, with those whose political and economic capitals are most vulnerable to extreme weather events and sea level rise putting climate control high on their national priority list.

Deliberation

Appendix A contains a graph of the G8-communique-encoded deliberations on climate change from the beginning of the G8 summits in 1975 to the present.

As can be seen from the graph, there was no deliberation on climate until 1979. Then the G8 leaders called for an expansion of "alternative sources of energy, especially those which help to prevent further pollution, particularly increases of carbon dioxide and sulphur oxides in the atmosphere" (G7 1979) This was not only the first summit to mention carbon, but also the first summit to make the climate-energy connection. However, this was the only mention of a greenhouse gas throughout the communiqué.

Following 1979, there was a 5 year period of silence on climate change. It re-emerged in 1985 at Bonn, which was the first summit at which climate change was referred to by name. This was the first year that the communiqué had an entire section devoted specifically to the environment. Here climate change was mentioned in a list of other environmental issues. No specific plans were made to mitigate climate change, only a general injunction to "address" the problem.

1985 was followed by a one-year lull in deliberation in climate change, as climate did not return to the communiqué in 1986. The 1987 Venice summit saw the return of climate to the agenda, in much the same form it had taken in 1985. Venice dealt with climate change as part of a list of environmental issues.

The 1988-1990 period saw a spike in deliberation on climate change, most notably at the 1989 Paris summit. Deliberation in 1989 on climate change was greater than it had been up until that time and would not be surpassed until 2005. 1989 saw a rise in both the volume and scope of the discussion on climate change. There was more talk of concerted action on climate change and a

focus on related factors such as the destruction of forests. 1990 was much the same as the previous two years. But it saw a resurgence of renewable energy resources, energy efficiency, and the importance of nuclear power, bringing back the energy-climate connection that had been missing since 1979.

The period from 1991-1996 was characterized by a low amount of deliberation, but still higher than pre-1989 levels. The 1991 London summit had a fairly high amount of deliberation on climate before it declined in subsequent years. The main focus of this summit was achievements to be made before UNCED in 1992, nuclear energy, and a climate change protocol. 1992 and 1993 both had little deliberation on climate, declining even further from 1991. They focused mostly on UNCED and Rio and the new Framework Convention on Climate Change. This sharp 1992 plunge was the beginning of a shift towards the UN in climate change deliberations. The 1994-1996 G8 summits focused on implementing commitments made at Rio under the UN Framework Convention on Climate Change as their mitigation strategy.

The 1997 summit in Denver did not see, in terms of volume, a much higher amount of deliberation on climate change. But deliberations moved away from a reiteration of the need to keep commitments under the Rio convention which had been the pattern for the previous five summits. In 1997, the G8 showed initiative independent of the UN when they stated in the Denver communiqué that "We are determined to take the lead and show seriousness of purpose in strengthening international efforts to confront climate change. Our ultimate goal must be to stabilize atmospheric concentrations of greenhouse gasses at an acceptable level. This will require efficient and cost-effective policies and measures sufficient to lead to a significant reduction in emissions." (G8 1997). This statement was linked to fighting for strong commitments at the upcoming negotiations for the Kyoto protocol.

This year of deliberation not pursuant to obligations at the United Nations was followed by the return of delegation to the UN from 1998-1999. During these two summits, climate change deliberation focused on the Kyoto protocol and other commitments under the Framework Convention on Climate Change. This was much the same during 2000-2001 summits. But there was also more talk of energy efficiency, the role of developing countries, and some general talk of the G8 taking a leading role in the mitigation of climate change in these years.

The period from 2002-2004 was characterized by a steep drop in deliberation. Climate change was absent from the agenda in 2002 and 2004. It was only briefly mentioned in 2003 as part of the G8's action plan for sustainable technology development.

2005 was a turning point, with more deliberation on climate change than at any previous summit. It was also the first and only summit (up to 2007) to have separate documents devoted solely to climate change. It was the first communiqué to acknowledge that climate change is human-induced. The 2005 communiqué called for more leadership from the industrialized countries and working with the emerging economies as well. The Gleneagles Plan of Action covers a wide range of mitigation strategies including clean fuels and renewable energy in different sectors of the economy, innovation, awareness and adaptation, climate monitoring, and an end to illegal logging. It launched a "new Dialogue" on climate change.

This high amount of climate change deliberation was maintained at the 2006-2008 summits. The focus of climate change deliberations was on the Gleneagles plan of action but also mentioned the United Nations. The 2006 summit focused mostly on climate change within the sphere of energy security, efficiency, and poverty. The 2007 summit focused on many of the same things that the 2005 summit had dealt with, but also noted the importance of attending the UN climate change

conference in Indonesia in December 2007 and trying to find a new strategy for the post-Kyoto period by 2009. The summit also focused on the importance of technology in mitigating climate change. All three summits focused on end to illegal logging.

In 2008, the climate deliberations focused on negotiations for a post Kyoto regime. It noted their "leadership role" in negotiating and fighting for a 50% reduction in greenhouse gas emissions by 2050 at the upcoming post-Kyoto negotiations to be held in Copenhagen in 2009.

Direction Setting

Facts

The fact which was first cited in a G8 communiqué in 1979 at the first climate change summit was the rise in levels of CO2 and nitrogen oxides in the atmosphere. This remained constant until, in 1988, the fact for the first time became climate change explicitly, briefly shifting back to concerns of atmospheric CO2 levels in 1989. From 1990-1996 climate change was again stated as the fact in the communiqués. CO2 was mentioned as the fact in 1997. In 1999 it was again climate change and remained so each year onwards.

Causes

The causes were often not explicit in the communiqués. Some, as in 1979, seemed to indirectly blame "old energy." Others, such as 1991 seemed to suggest that deforestation was a cause of climate change. However, not until Gleneagles in 2005 and the following summits was climate explicitly identified as human-induced.

Rectitude

Rectitude in the communiqués reveals a trend from less to more important and urgent. In 1985, climate change was considered a "concern." By the summit 10 years later in 1995, climate change had become a problem of "major global importance." In another 10 years, at Gleneagles in 2005 it was a "serious and long-term challenge." Just two years later in 2007 climate change was named "One of the major challenges of mankind… [An] urgent challenge."

Responsibility

The G8's attribution of responsibility went through a phase of more autonomous action from 1979-1991. After the Rio Earth Summit the G8's responsibilities were expressed more in terms of actions through the United Nations (the UNFCCC and the Kyoto protocol). 1997 was a more autonomously focused year. But the real rise in autonomous responsibility came with the Gleneagles Plan of Action with its wider scope of action needed and the idea that the G8 should take the lead.

Sustainable Development

The G8 has promoted the concept of sustainable development as a defining principle in the area of climate change. Sustainable development first appeared in the G8 communiqués in relation to climate change at the 1989 Paris summit, two years after it was envisioned by the United Nations in the report of the Bruntland Commission (1987). Sustainable development appeared on the climate agenda again in 1992, in the context of support for the Rio conference. At the 1996 Lyon summit, sustainable development was again mentioned as the basis for climate change mitigation. Sustainable development was part of the G8 agenda intermittently between 1997 and 2004. It played a large part in the climate change agenda during the 2005 Gleneagles summit. Indeed, the Gleneagles Plan of Action was aptly titled "climate change, clean energy, and sustainable

development". The 2006 St. Petersburg Plan of Action and the Heiligendamm process both reiterated the importance of the Gleneagles Plan of Action on climate change, clean energy and sustainable development. But it also noted the importance of sustainable development in reaching the climate change goals of these plans independently.

Decision Making

Appendix B shows the number of concrete, future-oriented, measurable decisional commitments made at the G8 summits from 1975-2007. There are just fewer than 200 commitments for climate change from 1985-2007. The number of commitments remained below nine a year, fluctuating slightly, from 1985-2004. In 2005 there was a sharp spike in the number of commitments, which more than doubled to 27 commitments. This peak was followed by three more ambitious years with 19 commitments in 2006, and 44 commitments in 2007.

Delivery

G8 Research Group Compliance Scores

The graph in Appendix B shows the average compliance of climate change commitments made between 1987 and 2006. There is an overall trend of increasing compliance with regards to climate change issues over time. There are, however, noticeable drops in both 1997, 2001 and 2006. When looking at the number of commitments as compared to compliance scores, in the first phase of climate change governance we can see a general rise in compliance. In the second phase we see a plateau in compliance, with the exception of 1998 and 2001, very high and low years, respectively. In the final phase we can see that there is a sharp peak in the number of commitments in 2005 followed by a peak in compliance scores. This suggests that the new autonomous view taken in the third stage of climate governance was an enormous boost for compliance.

Compliance Catalysts: The United Nations

Many commitments made on climate change at meetings of the G8 are connected in some way to a body of the UN. Therefore, the UN climate change regime exerts some influence over the implementation of these commitments. These bodies included the UNFCCC, the Kyoto Protocol, COPs, the Rio Summit, the Johannesburg Summit, the IPCC, the CSD, the WMO, and the GEF. By comparing compliance between commitments involving a UN body and those which do not, one can see if United Nations involvement made an observable difference in state behavior. Assessing the period from 1987-2007, based on G8 Research Group compliance scores, the comparison was made by averaging out the overall compliance scores of commitments referencing the UN and other bodies in the UN system those which did not. Commitments including the UN had an average commitment score of 44% while non-UN commitments had an average score of 39%. So, although the UN commitments showed higher compliance from G8 member states, it was not by a considerable margin. States were not driven to implement commitments involving the United Nations notably more than those commitments which were solely influenced by the G8.

Development of Global Governance

There was no mention of outside international institutions with regards to climate change in the communiqués until the 1988 Toronto summit. Here the United Nations was mentioned in the form of the UNEP and the WMO, urging the two to collaborate to create an intergovernmental panel on climate change under their auspices. The communiqué also mentioned the Toronto

Conference on the Changing Atmosphere. Since then, non-G8 international institutions, including UN ones, were invoked when the G8 discussed climate change in every year.

1989 saw nods towards the WMO and the IPCC and UNEP. They also called for an umbrella convention on climate change and a global climate observation system under the WMO. 1990 mentioned the second World Climate Conference, and reiterated the need for a convention to be completed by 1992 under UNEP and the WMO.

The 1991 communiqué mentioned UNCED in its plans to prepare for the Rio Convention. This UN cooperation was reiterated with the urge to ratify the Climate Change Convention in the 1992 communiqué. This was the beginning of a period of much focus on the UN system of climate change mitigation, with the 1993-1996 summits mentioning the UNFCCC and the Rio convention several times per year. 1997 proceeeded in the same vein, but focused on pushing a protocol forward rather than simply reiterating the need to follow the UN system of climate change mitigation. The 1999-2001 summits show a return to UN support, incorporating mentions of the Kyoto protocol in each communiqué.

The 2005 Gleneagles Summit saw a diversification of the international institutions mentioned. The leaders stressed that they would work in cooperation with the IEA and the World Bank to reach their goals. They mentioned the UNFCCC only as a basis for their own basic principles in relation to climate change such as sustainable development, and noted that they would continue their effort within the UN. The 2007 and 2008 summits mentioned the United Nations in the context of preparation for the new post-Kyoto negotiations scheduled for the Conference of the parties in 2009.

The 2008 summit communiqué mentioned an even wider range of international institutions, the most ever in fact. They mentioned the International Civil Aviation Organization (ICAO), the International Maritime Organization (IMO), the World Trade Organization (WTO), the International Atomic Energy Agency (IAEA), and the Global Environment Facility in their relevant roles in climate change mitigation. Thanks to the G8 climate change control was being mainstreamed in global governance as a whole.

The annual G7 environment ministers first met in 1992 leading up to the 1992 Bonn summit and at the UNEP conference in Rio in the summer of that year, where the G7 environment ministers held another meeting. There were no environmental ministers meeting for the 1993 Tokyo summit. But the environmental ministers meeting became an annual forum from 1994 onwards, save for 2004.

Gleneagles Dialogue on Climate change, Clean Energy and Sustainable Development

The Gleneagles Dialogue is the most ambitious example of G8 development of global climate change governance. The G8 decided at the 2005 Gleneagles summit to create a "new Dialogue between the G8 nations and other countries with significant energy needs, consistent with the aims and principles of the UN Framework Convention on Climate change. This will explore how best to exchange technology, reduce emissions, and meet our energy needs in a sustainable way, as we implement and build on the [Gleneagles] Plan of Action" (G8 2005). The aim of the Dialogue was to monitor the implementation of the Gleneagles Plan of Action, and find areas where the plan could be elaborated upon, or improved. The communiqué notes that the dialogue will involve work with the IEA, the World Bank, and other international institutions.

The first meetings of the Dialogue were held in the United Kingdom later in 2005. In 2006 they were held in Mexico. The Dialogue meetings were then taken on by countries of the G8 presidency, by Germany in 2007, and Japan in 2008. At the 2007 summit, the communiqué acknowledged Japan's willingness to receive a report of the Dialogue during their G8 presidency.

St. Petersburg Plan of Action on Global Energy Security
At the 2006 St. Petersburg summit, an ambitious plan of action was put forward to tackle vital issues with regards to energy security. One goal of the plan of action was to address climate change. The plan focuses on renewable energy, and a great deal on nuclear energy, but branches out into issues of illegal logging. The St. Petersburg Plan of action reaffirms the principles set down in the Gleneagles plan of action, especially those which connect climate and energy.

The Heiligendamm Process
At the 2007 Heiligendamm summit, the leaders decided to create a new "High Level Dialogue between G8 Member Countries and Brazil, China, India, Mexico and South Africa." One of the four issues to be addressed in the Dialogue was climate change. Specifically, the leaders noted the importance of "sharing knowledge for improving energy efficiency and technology cooperation with the aim to contribute to reducing CO2 emissions, consistent with the Gleneagles Dialogue on Climate change, Clean Energy and Sustainable Development, and the St. Petersburg Plan of Action on Global Energy Security."

The leaders requested that the OECD "provide a platform" for the dialogue with consultation from the IEA on issues of energy efficiency. The dialogue process began in 2007. The G8 Summit in Italy in 2009 a final report on the outcomes of the Dialogue Process ware scheduled to be presented.

Critical Cases

1979 Tokyo

Tokyo was the first summit to make a climate change commitment, even though the term "climate change" had not yet appeared. This was years before the UN would first address climate change policy. The leaders at Tokyo acknowledged that they "need to expand alternative sources of energy, especially those which help to prevent further pollution, particularly increases of carbon dioxide and sulphur oxides in the atmosphere" (G7 1979). Kirton (forthcoming) argues that the inclusion of climate change was an American initiative based on recent research that had come to light on the connection of fossil fuels and CO2 emissions affecting the earth's climate. This was also the beginning of the first phase of G8 governance on climate change. This first-and far reaching phase saw the active involvement of the United States with a non-existent initiative on the part of the hard-law United Nations. The commitment was a success, the G8 countries managed to stabilize their emissions of CO2 for the next five years.

1985 Bonn

The Bonn summit in 1985, hosted by Germany's Democratic Chancellor Helmut Kohl saw a return of climate change to the summit communiqué. It was also the first summit which referred to "climate change" as an environmental issue. Environment was of high importance that year, as evidenced by the fact that for the first time, environmental issues were given their own section of the communiqué. Climate change was mentioned here. The leaders stressed that: "New

approaches and strengthened international cooperation are essential to anticipate and prevent damage to the environment, which knows no national frontiers. We shall cooperate in order to solve pressing environmental policies such as acid deposition and air pollution from motor vehicles and all other significant sources. We shall also address other concerns such as climate change, the protection of the ozone layer and the management of toxic chemicals and hazardous wastes…" (G8 1985) in contrast to 1979, where climate change as carbon dioxide was combined with sulpher dioxide and thus acid rain, climate change was now combined with ozone, where a very different approach to global governance was taking hold (Hoffman 2005). Based on G8 Research Group scores, compliance with climate commitments was high with no members receiving a negative compliance score.

1989 Paris

By 1989, the UN had started to address climate change more fervently. The Bruntland Report in 1987 set the base for the sustainable development view towards climate that it would eventually take at Rio, which the United States eventually used as an excuse not to ratify and their first mention of climate change came on 6 December 1988 at the General Assembly (United Nations 1988). Though in 1988 the G8 had called for an intergovernmental panel on climate change, it was not until 1989 that the G8 suggested that the UN create an umbrella convention on climate change. Although there were three explicit climate change commitments that year, two of these pledged support for the United Nations instead of concrete actions by the G8 countries themselves. From 1988 to 1989 the UN captured the G8's climate governance.

1997 Denver

The Denver summit saw more G8 autonomy on climate after several years of climate governance left solely to the UN. The 1997 communiqué called for the G8 to become a leader, but this was short-lived pause in the middle of the phase of climate governance being "low and left to the UN." The next two summits saw only suggestions of the G8 keeping up with Kyoto protocol commitments. The negotiations for the Kyoto protocol were looming, coming at the UNFCCC Conference of the Parties in December following the summit. There was therefore much impetus for the G8 to take a leading role, to push the United Nations forward in making concrete and workable agreements on climate change mitigation.

2004 Sea Island

George W. Bush's Sea Island summit lacked climate change on the agenda, instead focusing mostly on terrorism and promoting democracy and other stabilizing measures in the Middle East and North Africa. The summit also focused on maintaining the strong economy. The only environmental part of the summit was a "three Rs" initiative pushed by a US-supportive Japan. (Kirton, forthcoming)

2005 Gleneagles

Even before the 2004 year began the British had signaled climate would be one of their priorities when they hosted in 2005.The 2005 Gleneagles summit was by far the most ambitious in terms of climate change than any other previous summit in G8 history. It can be considered the "great leap forward" for G8 climate governance. It enhanced considerably the G8 decision-making, deliberation, direction-setting, development of global governance and delivery in climate change.

In deliberation, as can be seen in Appendix A, 2005 saw an extreme rise in the amount of climate change deliberation. This was also the first summit in which climate change received its own document in the communiqué. In the area of decision making (Appendix C), there was a similar spike in the number of commitments on climate change. In terms of delivery, the chart in Appendix B shows that compliance with 2005 commitments were some of the highest in the history of G8 climate governance.

In the area of direction-setting Gleneagles was a groundbreaking summit. The action plan on climate change overtly linked the problems of climate, energy, and sustainable development as had been done at previous summits. These three important issues were addressed together in the dialogue. However, the real difference was in the area of development of global governance. The new Dialogue on climate change was unlike anything the G8 had ever done before in the area of climate change. It marked an independent and ambitious view of the problem. More important, however, was the inclusiveness that the 2005 summit brought to G8 governance of climate change.

Causes

Prime Minister Tony Blair had decided to make climate change a top priority for 2005 as early as the fall of 2003. An influential figure driving him to do so, and the force which eventually convinced the Prime Minister and his government of the acute importance of climate change, was his Chief Scientific Advisor Sir David King. Appointed in 2000, King had mounted a vehement campaign to convince the Government of the United Kingdom of the importance of climate change when speaking at joint meetings of the House of Lords and the House of Commons (King 2009). Giving the Zuckerman lecture to the British scientific community in late 2002, King stressed the fact that there was concrete evidence for humans being causally linked to climate change, and warned above all other consequences about the impact of climate change on sea levels and the problems sea-level rise would cause to coastal nations. (King 2002) What gave the final urgency to the climate change issue was his address to the American Academy for the Advancement of Science in early 2004, and the "furor that followed." (King 2009) At this talk, and a corresponding op-ed piece in the AAAS journal *Science* which had been recently released, King again argued for the urgency for coastal states to act, noting that in the United Kingdom "by 2080, flood levels that are now expected only once in 100 years could be recurring every 3 years" (King 2004). His statements also included harsh criticism of United States policy toward climate change, arguing that it was a more urgent issue than terrorism, the main focus of Bush's Sea Island Summit later that year (King 2009).

King was also a driving force behind the inclusion of emerging economies in the Gleneagles process (King 2009). At both the Zuckerman lecture in 2002 and the AAAS lecture of 2004, he stressed the importance of the inclusion of the north as well as the south in any climate change mitigation strategy.

From the beginning, science played an important role in the Gleneagles agenda on climate change. In September of 2004, Tony Blair announced the conference "Avoiding Dangerous Climate Change" organized by the Department of Environment, Food and Rural Affairs (DEFRA) for February of 2005 in Exeter at the Met Office Hadley Centre (DEFRA 2005). The conference was designed both to further climate science and to explore solutions to the issues being faced. It was decided at the conference that scientific study would play an integral role in subsequent international meetings which addressed climate change of which the Gleneagles summit was one (King 2009).

The chart in Appendix E shows that the G8 had suffered a lag in the inclusiveness of membership in terms of constraining top emitters. China's CO2 emissions from fossil fuel burning had surpassed all G8 countries aside from the United States in 1975 and had risen quickly in the previous decade. India had surpassed all G8 nations except for Germany 10 years prior to the Gleneagles summit. Mexico and South Africa emitted on par with France since the mid-90s. This new inclusiveness finally brought in high emitters who had been left out of the negotiations a decade after they had reached comparable emissions.

World oil prices were on the rise between 2002 and 2003, and continued to climb steeply through to the 2005 summit (EIA 2007), an incentive for G8 nations to consider clean energy as part of their agenda. In August of 2003, Europe had experienced an intense heat wave reaching record highs, killing approximately 2000 people in Britain, with death tolls of up to 9000-20,000 estimated in Germany, France, and Italy. The real effects of climate change becoming visible at home. (ISDR 2006, BBC 2003)

Upcoming Summits

2009 La Maddalena

The summit hosted by Italy at La Maddalena later this year will focus primarily on African development. But the Italian host has placed climate change high on the agenda, with a view towards continuing and expanding the dialogue set down in the 2007 Heiligendamm process and towards the creation of a strong post-Kyoto regime at COP15 in December 2009.

2010 Huntsville

Prime Minister Stephen Harper announced in the summer of 2008 that the G8 summit would be held in Huntsville, Ontario and that the summit would be an opportunity, inter alia, for Canada to push for "a global solution to global warming." (PMO 2008) This announcement came just months after the unveiling of the "turning the corner" plan in March 2008, which is scheduled to come into effect in January 2010 as the Canada takes the G8 presidency. (Environment Canada 2009)

Causes of G8 Climate Performance

The climate performance of the G8 can be largely explained by an adaptation of the Concert Equality Model of G8 governance (Kirton forthcoming). The model is based on the vulnerability faced equally by states, the failure of other major international organizations to deal with the problem of climate change, the equal capabilities of all G8 nations giving incentive for concerted action, the common principles shared by G8 nations, and the constricted nature of the G8 process. In the present cases, the causes which standout as salient are the degree and success of UN governance in climate change, G8s inclusion of the relevant powers on both the sources and sinks side, shock activated vulnerability within the G8 nations, and pressure from the scientific community.

Equalizing Shock-Activated Vulnerability

There are two ways in which G8 nations experience the equalizing effects of the climate change issue. These are chronic, compounding stress and sudden severe, surprising shocks.

Stress. The global nature of the climate change problem has equalizing effects for all G8 nations. All nations are harmed when greenhouse gas is emitted within the border of one country. This includes fossil fuel burning, but also the destruction of sinks such as the rainforest and the melting of ice. Each G8 nation therefore has equal stake in protecting the global public good if it wishes to avoid becoming increasingly vulnerable to climate change. ON the critical dimension of sea level rise, the equalization of vulnerability arises from the fact that the G8's most powerful members—the US and Japan—have both the political and economic capitals on the sea coast while the weakest members of Canada and Russia do not.

Shocks. Shocks are important in driving G8 governance in climate change. There are several shocks which are either climate related, or drive climate governance in some way. Oil prices and supply shocks can be considered a potential driver behind G8 climate governance in the area of energy efficiency. If we look at climate change deliberation data compared to trends in world oil prices, there is a direct correlation. The major years for energy efficiency and nuclear energy in the G8 climate agenda over past summits correspond to sharp peaks in oil prices. The 1990 summit focused on energy efficiency as part of its climate agenda, this corresponds to the highest spike in world oil prices since the crisis in the early 1980s, due to the Gulf War I (EIA 2007). The next summits to seriously address energy efficiency in its climate agenda was the 2000 and 2001 summits. This corresponds to a peak in oil prices even higher than those of 1990 taking the world price over 30$ per barrel. (EIA 2007) Energy efficiency was not addressed as part of climate change deliberations again until the 2005 Gleneagles summit, at which point world oil price had reached 40$ a barrel and was continuing to climb quickly (EIA 2007), explaining the St. Petersburg 2006 and Heiligendamm 2007 focus on energy efficiency with concerns for climate issues.

Other shocks that can explain the G8 performance on climate change, primarily the third phase of high climate change deliberation and compliance are climate caused or compounded shocks. Such extreme weather events remind all G8 nations that they are vulnerable to the consequences of climate change. Natural disasters which are climate related include heat waves, droughts and forest fires, and tsunamis, hurricanes, and floods. The first offer direct physical evidence of "global warming," while the second suggest the abrupt plausibility of climate change. As climate related natural disasters have become more prevalent, and more deadly worldwide, the G8 climate agenda has expanded. In the time surrounding the 2005 Gleneagles summit and Tony Blair's decision to include climate change, death tolls from natural disasters were on the rise globally and several of these climate-related disasters directly affected G8 countries. (EM-DAT 2009) Sir David King warned of the perils of rising coastlines and increased flooding on the well being of the United Kingdom's citizens and economy in 2002. (King 2002) In August of 2003, G8 nations including, Germany, France, Italy and the United Kingdom were reminded of the peril caused by climate change when a heat wave across Europe caused death in the tens of thousands. The Indian Ocean Tsunami in December took the lives of citizens from G8 countries as the overall death toll reached upwards of 200 000. The following year in August of 2005, Hurricane Katrina was the third deadliest natural disaster of 2005 killing over 1300 people, and causing the most economic damages of any disaster in the previous 10 years reaching 170 Billion $ in damages. (ISDR 2006)

Multilateral Organizational Failure

The second cause of the three phase pattern of G8 governance of climate change is the failure of multilateral organizations, namely the United Nations, to produce concrete policy solutions to the climate change problem, even as they increase the scientific credibility of the severe, urgent and possibly irreversible effects.

The international system remains siloed, selective, separated in its approach to climate change and environmental issues as a whole. As Kirton (2000) argues, the lack of a World Environmental Organization has dire consequences. Multilateral organizations have been able to organize economically in the form of the WTO, the IMF, and the World Bank, but have failed to create a similar system which would include and integrate all cross boundary and global environmental issues facing states in a comprehensive way, balance the more powerful economic and development bodies, and relate easily to those responsible for food and agriculture and health. The United Nations has failed to take a leading role in the establishment of such an organization, and has only a programme, UNEP, to offer, which has shown itself to be highly ineffective in the area of climate change. It has no body at all on the field of energy, which was central to the G8's effective climate governance in phase one and three.

The G8 first took up the issue of carbon emissions when UNEP was still silent on the issue of climate. The G8 therefore provided much needed climate change governance. High deliberation in 1989 and 1990 was focused on getting UNEP to take action in the form of the IPCC and creating a convention on climate change at the Rio Earth Summit in 1992.

The G8's critical call for the creation of the IPCC, before its endorsement of a convention, shows the G8's science driven approach, as do the role the role of the WMO findings in inspiring G8 action in 1979. The second phase of G8 governance was "low and left to the UN. Here G8 deliberation and decision making on climate change focused on the new UN framework convention on climate change. This low period lasted until the great leap forward in climate change at the Gleneagles summit in 2005, and was broken only by the 1997 Denver summit, which saw an independent attitude towards climate change on the part of the G8 as they pushed the United Nations further to create a protocol at COP 3 in Kyoto in December of that year. However, by 2005, it became clear that the United Nations top down convention-to-protocol model of climate change mitigation was failing to reign in top emitters. Its broad consensus strategy had led to weak commitments on the part of the worlds' up coming top emitters such as China and India. Nearly all countries failed to meet their commitments under the Framework convention on climate change or the Kyoto protocol, and the United States, the world's top emitter of carbon dioxide, has refused to ratify.

As it became apparent that the United Nations convention-to-protocol model failed to reign in top emitters in both the north and south, and to produce adequate solutions to the climate change problem, the G8 began to take the most ambitious and independent role yet on the climate change issue at the Gleneagles summit in 2005. By bringing the worlds' emerging economies into the dialogue on climate, the G8 achieved what the UN had failed to do, to include as equals the important top emitters and absorbers which were excluded from the binding control commitments of the UN system. The G8 has continued to play a leading role in climate change governance since 2005, continuing to push for better governance from both the north and south and pushing for a more effective and equal post-Kyoto framework at COP 15 in 2009.

Predominant and Equalizing Capabilities

The third key cause is the predominant and equalizing climate capabilities of the G8 member states. The G8 is an important forum for the mitigation of climate change because its members contain, and increasingly so, the most capable countries in the mitigation of and adaptation to climate change.

The G8 (with the enlarging EU) contains a large and in many cases majority share in areas most relevant to climate change. The G8 countries (and the EU) contain 86.6% of the world's temperate forests, 56.9% of its industrial CO2 emissions, 52.5% of its primary energy production, and 36% of the world's coastline. This large share of critical environmental resources and emissions make concerted effort on the part of the G8 nations far outweigh the benefits of unilateral or bilateral action on climate change. Collective action is required because even the most capable country s able to solve the problem (by mitigation and even adaptation on its own.) It is also important to note the equality among G8 members in their capabilities relevant to climate change. The United States the G8's most powerful member, is the top emitter in industrial C02, has the highest rate of primary energy production in the G8, and the most natural protected areas. Canada, although it is the weakest member of the G8, has critical capabilities in the area of climate change. Canada ranks first in coastlines (15.6% to the US 3.4%), temperate forests (22% to the US 14.3%), forest cover and extent of natural forests, renewable fresh water (7.1% to 6.1%), and land (7.1% to the US 7%). (Kirton forthcoming). Russia is in a similar state. In this way, all G8 nations are critical to the strategy for climate change mitigation. The membership of the G8 reflects the configuration of capabilities required for effective climate change mitigation.

In recent years, the G8's increasing inclusiveness has had a positive effect on its climate change related capabilities by bringing in top emitters, and therefore in its effectiveness to mitigate climate change as an institution. The inclusion of Russia in G8 summitry was the first such example. Russia's temperate forests outrank even Canada (Russia's 45.6% to Canada's 22%). Russia has the second highest industrial C02 emissions of the G8 countries (15.8% to the US's 21.8%), and primary energy production (19.4% to the US'20.2%)'(Kirton, forthcoming)

The second wave of climate related capabilities has been the inclusion of more and more of the world's emerging top emitters to the G8 club since the Gleneagles summit in 2005. China's CO2 emissions have been second only to the United States since 1975 and have surpassed them now. Since 1995 India has been a high emitter amongst the G8+5 under only Japan, Russia, the United States and China, sand surpassing Japan in 2002. Mexico and South Africa have had comparable emissions with G8 countries since the mid-90s, although not reaching the heights that India and China have. (CDIAC 2008) The inclusion of the +5 nations was therefore a large step in bringing in top emitters, and predominant and equalizing capabilities to the G8.

Common Purposes, Priorities, Policies, Problems, Preferences

All G8 countries share a set of principles. All G8 and +5 countries (with the exclusion of China) function based on free-market economies and are politically democratic. All G8 members are major world powers, and they invariably share certain norms. However, in their environmental and climate change policies, G8 nations have varied environmental values and priorities.

One way to look at the differing principles of G8 countries is to study their history of environmental policy. The greatest indicator of a priority in the environment is perhaps the creation of environment departments in the domestic government. The first G8 governments to consider the environment important enough to merit is own department were The United States with the creation of the EPA in 1970, (EPA 2009) Canada, with the creation of the Department of the environment in 1971 (Environment Canada 2009), France and Japan, with the creation of their Ministries for the environment in 1971 (Ministère de l'Ecologie et du Développement durable 2006, MOE 2009). The next G8 countries were Germany with the creation of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety in 1986, as a response to the Chernobyl nuclear accident, (EUGRIS 2005) and Italy's creation of the Ministry for the environment, also in 1986 (MEDIES 2004). The United Kingdom was the last of the G7 nations

with the creation of its Environment Agency in 1996 (DEFRA 2001). Russia created its Federal Service for Ecological, Technological and Nuclear Oversight in 2004, several years after becoming a full G8 member (Russia Federal Service for Ecological, Technological and Nuclear Oversight. 2005). Thus only by 2005—the year if the great leap forward in G8 climate governance—did all G8 members have a common institutionalized commitment to and capacity for climate change control.

In the area of climate change policy specifically, some G8 nations have placed priority on climate change earlier than others by creating comprehensive climate change plans. Canada first addressed climate change in their "Green Plan" of 1990, but did not create a comprehensive plan for climate alone until Environment Canada's "Turning the Corner" climate change action plan was released in 2008, to come into effect at the beginning of 2010. (Environment Canada 2009) Japan placed priority on climate change early on with their "Action Programme to Arrest Global Warming" which came into effect in 1990. (OECD 1994) France followed shortly with their "National Greenhouse Gas Abatement Programme" of 1995. (OECD 1996) Although Germany had addressed climate as early as 1990 (OECD 1994), they did not adopt a comprehensive climate change plan until 2007. (Germany Federal Ministry for the Environment, Nature Conservation and Nuclear Safety 2007) The United Kingdom did not release their climate strategy until 2000 (DEFRA 2001); the United States and Russia are yet to adopt comprehensive plans of their own, although President Barack Obama is working to create a climate plan for the United States. (Washington Times 2009)

Overall the placement of climate change as a priority within government can help to explain the pattern of G8 effectiveness in climate change. The 1989-1990 period of high climate performance was a year in which three G8 nations (Canada, Japan, Germany. The G8's climate leaders) made climate change a priority as part of their wider environmental policies. There was not much action again within governments until the years leading up to and after the 2005 Gleneagles summit, with comprehensive plans created or drawn up by several G8 nations during the 2004-2008 period.

Political Control and Capital

Democratically elected leadership plays an important role in the effectiveness of G8 climate change governance. Due to the democratic leadership of G8 countries, and the large amount of media the summits receive, G8 leaders must take into account what is important to the citizens of their countries while having the political capital and control sufficient to make effective adjustments for agreements abroad confident that they can mobilize domestic consent to deliver the ensuing G8 agenda and survive and thrive domestically back home.

The role of leaders in the G8 climate change governance comes increasingly in the form of the summit host, who decides which issues will be on the agenda that year. It was George W. Bush's concern over terrorism as host at the 2004 Sea Island summit which overshadowed concerns about climate change and other environmental issues from other G8 leaders. It was Tony Blair's decision not only to put climate at the top of the G8 agenda but also to include the +5 emerging economies that began the phase of effective, independent G8 climate leadership at the Gleneagles summit in 2005.

Controlled Constricted Participation

Controlled, constricted leaders participation refers to the advantages of a small group that efficiently arrives at, monitors collective agreement, flexibly assembles the right members and

participants for the task at hand, and directly engages the comprehensive, authoritative ambitions of leaders themselves.

One reason why the G8 has been effective in times of multilateral institutional failure, especially in the period since 2005, where the UN conference-to-protocol model had proved to be ineffective in creating results in the area of climate change is its restricted membership that is adjusted at the discretion of its members to deal with the task at hand. The G8 process is unhampered by weak commitments and free riding due to broad consensus which has plagued the United Nations approach to climate change mitigation. The G8 has managed to maintain a small group of the most important nations for the effective mitigation of climate change, and has proven more effective in constricting top emitters in the South than the United Nations. The G8 has become increasingly inclusive with the inclusion of Russia as a full member in 1997 and the invitation of the +5 emerging economies to the 2005 Gleneagles summit anfd the MEM 16 in 2008. Throughout the three stages of G8 environmental governance, the G8 was able to act as a force to break the logjams in the United Nations approach to climate change first in the early 1990s by calling for concrete commitments at Rio, then in 1997 by calling for the creation of a strong protocol, and finally from 2007 onward in calling for a more effective post-Kyoto regime to be negotiated by 2009. The addition of Canada in 1976 added a little with a lag for 1979. That of Russia in 1997-9 accompanied the deliberative and decisional spike of those years, that of the plus five in 2005 helped drive the surge that year, and that of Indonesia, South Korea, and Australia (as newly committed climate control countries) was helpful in 2008.

Conclusion

G8 climate governance has unfolded in three stages. These stages are early extreme effectiveness from 1979-1990, deference to the UN from 1991-2002, and revived autonomous effectiveness since 2003. This pattern can be explained by several causes. First is the degree and success of UN governance in climate change. Second, the inclusion of top emitters on the sources and sinks side. Third is the equalizing vulnerability within the G8 nations, namely shock activated vulnerability including oil price shocks and extreme climate change related weather events. At the leader and national level, the agenda's of specific hosts and the varying priority placed on climate change by G8 nations were also influential in the effectiveness of climate change governance from summit to summit.

Anomalies to Be Explained

There are still unsolved cases awaiting explanation. The first is the questions surrounding the 1997 summit. What was the reason for this temporary turn away from the prevailing pattern of "low and left to the UN?" If it was greater independence due to G8 interest in moving the Kyoto process forward, this still leaves the question of what role the G8 played specifically in the negotiation of the Kyoto protocol. Here the role of US hosting under the Clinton-Gore administration as an opportunity for American leadership on G8 climate governance needs to be explored.

Another outstanding issue is the upcoming summit in 2010. Why did Prime Minister Harper choose to put climate change as a key item on the agenda for the Huntsville summit? Further enquiry into this decision is needed.

Future Research

There are specific areas on the record of G8 governance in climate change that could benefit from further research. The first is exactly what part scientific consensus had to play in how the G8 framed and governed climate change from 1979 forward. Although it is clear that the scientific community had a large role to play in 1979 and in the lead up to the 2005 Gleneagles summit, the relationship between science and G8 governance of climate change merits further investigation.

Another area of potential interest is in the area of climate-related and energy shocks on G8 climate governance. Although this study points to correlations between key data points and both extreme weather and energy shocks, more research would undoubtedly uncover the subtleties of the relationship, including whether it is only a physical, material process, or also a cognitively, socially constructed one in which media myths and messages play an important part. Questions such as whether death or economic losses play a larger role in G8 climate governance and the difference in effect of shocks within G8 countries or outside require further study.

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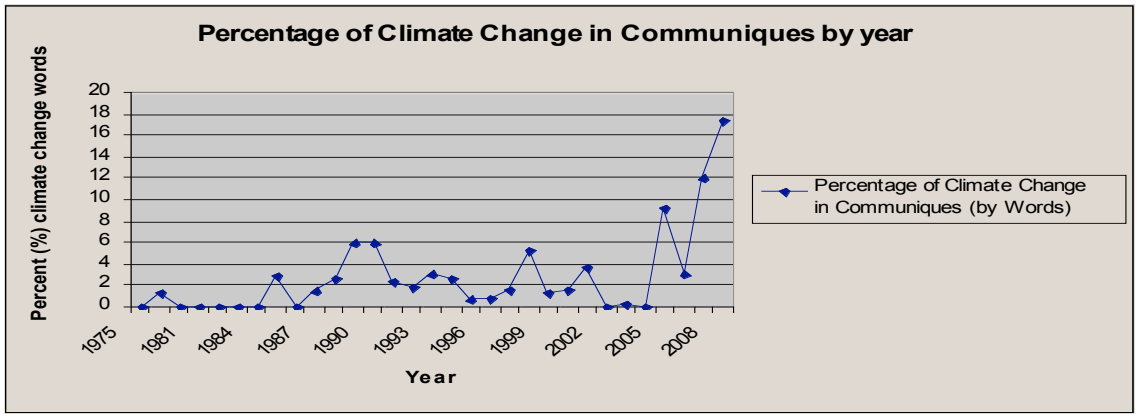
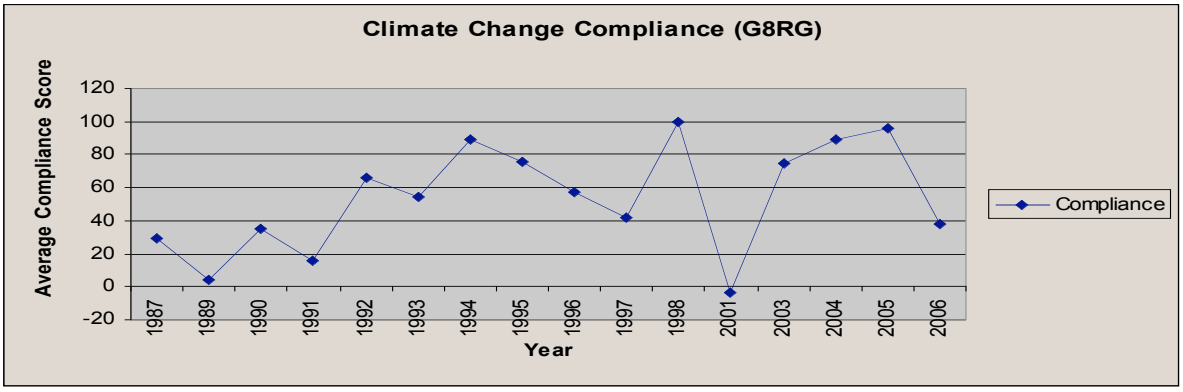
Appendix A:
G8 Climate Change Deliberation 1975-2008



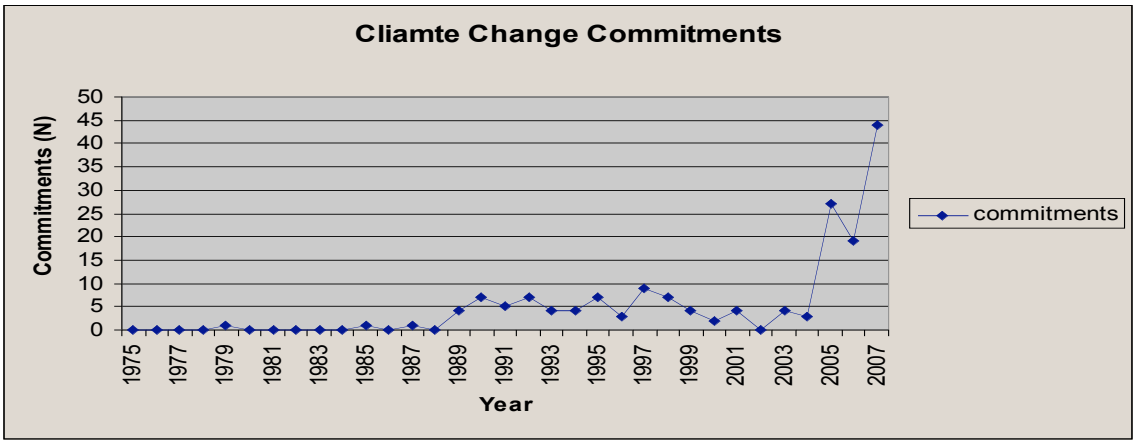
Summary of Climate Change References in G8 Summit Communiqués

Year	Total CC Words	% of Overall Words	Total CC Paragraphs	% of Overall Paragraphs	Total Documents with CC	% of Overall Documents	Total Dedicated CC Documents	% of Overall Sections
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	28	1.3	1	2.6	1	50	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0
1985	88	2.9	1	1.9	1	50	0	0
1986	0	0	0	0	0	0	0	0
1987	85	1.5	1	1.1	1	14.3	0	0
1988	140	2.7	1	1.2	1	33.3	0	0
1989	422	6	7	5	1	9.1	0	0
1990	491	5.9	5	3.6	1	33.3	0	0
1991	236	2.4	5	2.8	1	20	0	0
1992	137	1.8	4	2.5	1	25	0	0
1993	154	3.1	1	1.2	1	33.3	0	0
1994	107	2.6	2	2.1	1	50	0	0
1995	87	0.7	3	1.1	1	25	0	0
1996	167	0.8	3	1.4	1	14.3	0	0
1997	305	1.6	5	1.7	1	16.7	0	0
1998	323	5.3	4	4.1	1	25	0	0
1999	198	1.3	1	0.3	1	25	0	0
2000	213	1.6	2	0.5	1	20	0	0
2001	232	3.7	3	2.1	1	10	0	0
2002	0	0	0	0	0	0	0	0
2003	62	0.3	3	2.3	1	5.9	0	0
2004	0	0	0	0	0	0	0	0
2005	2667	9.3	68	9.9	3	8.1	2	5.4
2006	1533	3.1	26	2.6	3	12	0	0
2007	4154	12.0	47	9.0	5	41.7	0	0
Average	358.5	2.12	5.85	1.79	0.88	15.82	0.06	0.16

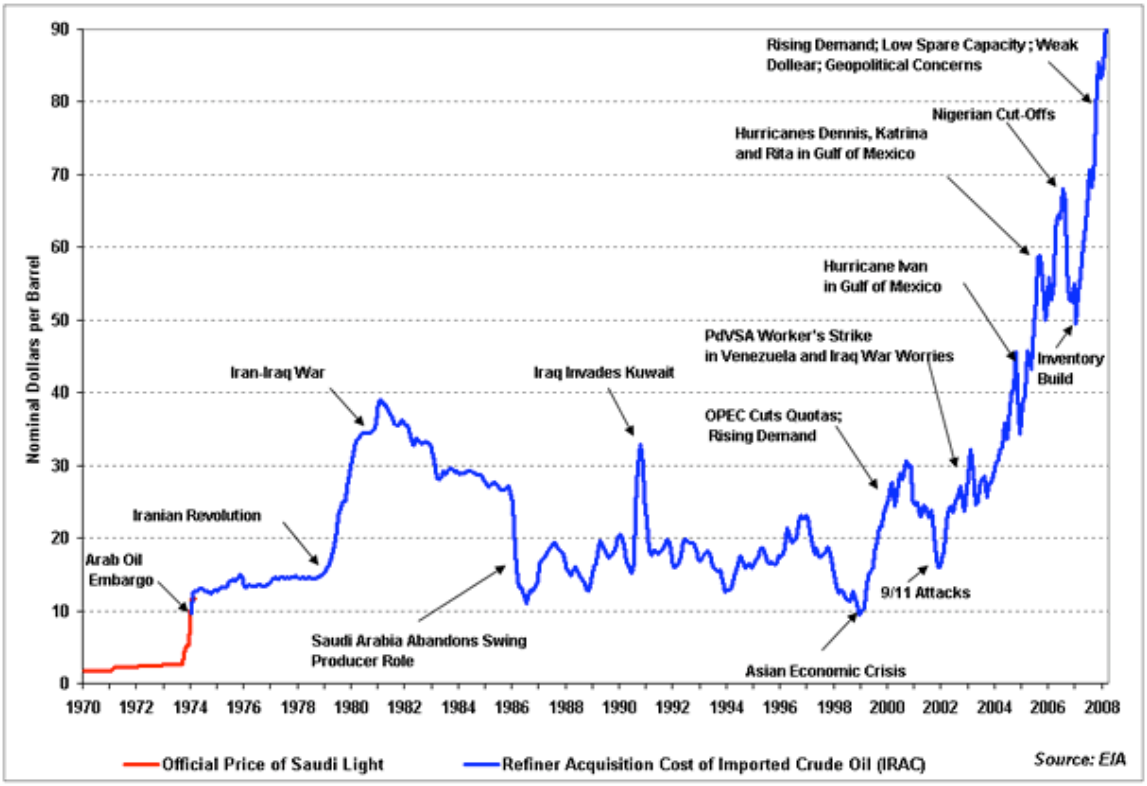
Appendix B:
G8 Research Group Climate Compliance 1975-2006



Appendix C:
G8 Climate Change Commitments 1975-2007



Appendix D:
World Oil Prices 1970-2007



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Appendix E:
G8+5 National C02 Emissions from Fossil Fuel Burning