

The G8's Energy-Climate Connection

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Introduction

The issues of energy security, climate change and their connection have been subjects of G8 governance since the very start. At the conclusion of the first summit at Rambouillet, France, on November 15-17, 1975, the six leaders there collectively declared “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, they noted the need for the “rational use” of energy resources (G7 1976). In 1977, with the European Community present, they affirmed the value 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). In 1979 they stated “we 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).

The importance of G8 governance for energy security, climate control and their relationship has been enhanced by the long absence of global intergovernmental organizations dedicated to the task. The charter of the United Nations is silent about the existence, let alone the value, of energy security or the natural environment. The UN system lacks any functional organization to deal with either energy or the environment overall, beyond the fragile United Nations Environmental Programme (UNEP) created in 1972 (Kirton 2004). The Atlantic system of international organizations, centred in the North Atlantic Treaty Organization (NATO) and the Organisation for Co-operation and Development (OECD), has generated only the International Energy Agency (IEA) in 1974, from which France — one of the G8's original six — at first stood aloof. The global community thus was institutionally defenceless as the oil shocks of 1973 and 1979 from the Organization of Petroleum Exporting Countries (OPEC) assaulted the global economy, and as the trees dying from acid rain in North America and Europe showed that a greater reliance on coal and other hydrocarbons killed living things. When one of the world's leading pioneers of the post-World War Two order, George Kennan (1970), called for a new global institution to meet these challenges, only the G8 responded to the call.

It thus matters how and how well the G8 has governed energy, climate and their connection during the 32 years in which it has been engaged in this task. Thus far, however, accounts of the G8's energy and its climate governance have been inconclusive, ranging widely from judgements of “effective” to “harmful,” and differing on why the G8 is effective and what its proper role should be. And there have been no studies focused on how the G8's energy and environment

governance have come together, in relation to wide range of values, including climate change control (cf Kirton 2001a).

This study provides the first systematic account of the G8's energy-climate connection. To do so it first applies a standard framework for assessing G8 performance to chart how the G8 has contributed to domestic political management, deliberation, direction-setting, decision-making, delivery and the development of global governance in the energy field. It then conducts a similar analysis for the G8's climate governance. It next traces the connection between energy and climate forged by the G8, through intellectual innovation, catalytic initiative and implementation, institutional integration and institutional inclusion. It concludes by highlighting the overall pattern, its causes and the outstanding challenges that the 2007 G8 Heiligendamm Summit confronts and could well meet.

This study concludes that the G8 has governed effectively to enhance energy security, confront climate change and connect the two in ways that increasingly put climate protection in an integrated, equal and privileged place. This integration and equalization has proceeded through ideas, initiatives, institutionalization and inclusion. In ideas, the G8's longstanding consensus on stabilizing emissions through energy conservation, efficiency, alternatives, nuclear power, investment and technological innovation has been replaced in 2005-06 by a new consensus on the centrality, urgency and comprehensive nature of the energy-climate link. In initiatives, the "Bush-Blair breakthroughs" of 1990 and 2005 have been central in producing this new consensus and the ambitious commitments, high compliance, and the United Nations Framework Convention on Climate Change (UNFCCC) and G8 plus 5 Gleneagles Dialogue, that have put it into effect. In institutionalization, the G8 has combined energy and climate actors in G8-centred bodies, most vigorously in 1979-80, again in 2003-05 and, above all, when George W. Bush hosted the summit in 2004. In inclusion, the G8 has increasingly involved at the summit and ministerial levels the other consequential energy and carbon-producing and -consuming countries, in a balanced but G8-guided way.

Given this record, the G8's 2007 Heiligendamm Summit can be expected and asked to do a great deal. For the conditions that have caused high performance in the past — high G8 energy vulnerability, iteration, institutionalization and a capable, committed host — are currently in place. The Heiligendamm G8 thus will and can go a long way to meeting its critical challenges of getting its Kyoto-unconstrained participants to "commit to commit" to carbon-controlling actions in the years ahead, and to actually control their carbon even without a commitment, starting now. To help advance these objectives, G8 leaders should consider devoting their doubling development assistance to clean energy and climate control, reforming the international financial institutions (IFIs) they control for this purpose, relying more on Russia and building the G8 system in more institutionalized, inclusive and leader-driven ways.

The G8's Energy Security Governance

Of the many policy areas that have been the subject of G8 governance, energy stands out as one in which the G8 has been the most effective, across all of the six dimensions by which G8 performance can be assessed. As Appendix A suggests, Bayne's overall grading of the annual summit gives high marks to those summits when energy was a leading issue, especially due to their energy-related achievements in the early years (Putnam and Bayne 1987, Bayne 2005). The summits devoted relatively high attention to energy during this time, as energy took 70% of the communiqué in 1979. Energy also ranked high from 1990 to 1997, and from 2002 to 2006. As appendices A and B show, these deliberations often generated many decisional commitments,

above all since 2002. The G8 produced an exceptionally high 77 energy commitments at Gleneagles in 2005 and a historic high of 132 (or 42% of the 317 total) at St. Petersburg in 2006.

Moreover, these commitments make a difference. An analysis of compliance with G7 commitments from 1975 to 1989 shows that energy is the area where compliance was the highest (von Furstenberg and Daniels 1992). Importantly, as Appendix C shows, with rare exceptions similarly high compliance scores have come from 1990 to 1997, and especially from 1998 to 2006 after Russia became a full member of the club. And, as Appendix D shows, in 2003, 2004 and 2005 the U.S. had a perfect compliance record of +100%, both on the conventional energy commitments and on the energy-related weapons of mass destruction (WMD), terrorism and non-proliferation ones.

The G8 has also done much to render its energy governance deep, detailed and durable by creating G8-centred energy institutions of its own. To be sure, a G8 ministerial forum for energy emerged only in 1996 and has met infrequently since. But energy was the subject of the only inter-sessional summit ever held — on nuclear safety in Moscow in 1996. Moreover, as Appendix D shows, at the official level, the G8 generated nothing but energy bodies — eight of them — from 1975 to 1980. It began creating them again in 1992, and with increasing frequency after 2000, producing a total of 13 from 2000 to 2005. No other policy area of G8 governance has been institutionalized as much as energy has.

In examining critical cases of high G8 performance, energy again stands out. At the high-scoring 1979 Tokyo Summit, the G7 took bold actions that broke the threat and damage of OPEC-bred oil shocks for good. And in 2006, when Russia hosted its first regular summit, energy was the top priority. Its summit produced a far-reaching set of energy principles accepted by all member states and acted to protect critical energy infrastructure from terrorists for the first time (Kirton 2007). Yet it is worth noting that energy was also the subject of one of the G8's greatest failures, as the leaders fell out at Versailles 1982 over a Soviet gas pipeline to western Europe, which the Europeans wanted but Ronald Reagan's U.S. did not.

The G8's Climate Governance

In the field of climate change, G8 governance started later, but also grew to be a prominent and effective part of the G8's work. As Appendix E suggests, Bayne's grades largely bypass the G8's environmental achievements, save for the energy-related ones of the 1970s and the stand-alone "environment" one in 1989. But the G8 took up climate change very early, at the Japanese-hosted summit in 1979, and returned to it at the much maligned German-hosted summit in 1985. Since 1987 the G8 has dealt continuously with climate change, save for the two "North American sabbaticals" in 2002 and 2004, when Canada and the United States hosted respectively. Climate soared to new heights of attention in 2005 and 2006. These G8 deliberations produced decisions, starting in 1987 and continuously (save for 2002) ever since. Again 2005 and 2006 saw a step-level jump to unprecedented highs.

These commitments made a difference in constraining the subsequent behaviour of G8 members, through three phases. As Appendices E and F show, from 1987 to 1991, compliance with the measured climate change commitments was only +3.5%. From the German-hosted summit at Munich in 1992 to the British-hosted summit at Birmingham in 1998, it soared to +78%. And the 21st-century summits from 2003 to 2005, hosted in turn by France, the U.S. and Britain, saw compliance with climate change commitments average a very high +89%. It is clear that the G8 climate change commitments are those that bind.

Perhaps more strikingly, G8 climate change commitments are the ones that bind the U.S., in the way that the UN ones, centered in the UNFCCC's Kyoto Protocol, have so clearly failed to do (Kokotsis 1999). As Appendix F shows, the U.S. started slowly to comply with its G8 climate commitments. But in 1992 it moved into the positive range, and in 1993 became strongly positive, usually registering complete compliance at +100%. Since 1998 its record has never been worse than that of the G8 as a whole. It is clear that G8 climate commitments are those that compel its most powerful member and non-Kyoto signatory, the United States, to act in the desired way.

The G8 has also done much to develop global climate governance institutions, with the U.S. often in the lead. As with energy, the G8 system long remained devoid of an environment ministers institution, until 1992 when the German hosts first held one, then in 1994 when the Italians followed and then again in 1995 when the Canadians called one the following year, thus creating an annual institution. The G8 environment ministers forum was thus in the vanguard of the post-Cold War process of G8 ministerial institution building for functional portfolios, and has helped the G8 increasingly connect with civil society in its work (Risbud 2006). At the official level, as Appendices D and E show, the first generation of G8 governance from 1975 to 1980 created seven bodies related to climate change. Another six arose from 1981 to 2001. But the years from 2002 to 2006 saw an upsurge, with 15 created in the climate-related and climate-dedicated fields. Eight of them came from the U.S.-hosted Sea Island Summit in 2004. Perhaps the most important body has been the G8 Plus Five process, notably the Gleneagles "Dialogue on Climate Change, Clean Energy and Sustainable Development," created at the British-hosted 2005 summit. It involves the U.S. and the emerging carbon-producing powers not constrained by Kyoto in a dialogue aimed at real carbon control on the part of all.

There have been several G8 summits where the cause of climate change control has been importantly advanced. These include 1979 when this issue first arose, 1985, where the basic issue area and its defining principles were first established, 1987 where the first concrete climate commitment was made, 1989 where the environment dominated the agenda, 1997 where the Kyoto Protocol signed at year end was given an important boost and, above all, 1990, 2001, 2005 and 2006. At the 1990 Houston Summit, the G7 leaders agreed to deal with climate change using all sources and sinks, and convinced a skeptical president George H. Bush to go to the 1992 UN Rio conference, work in tandem with his G8 partners there, and sign the UNFCCC that the Rio conference produced. At Genoa in 2001, held just after newly elected president George W. Bush had withdrawn the U.S. from the Kyoto Protocol, the leaders of Japan, Canada and Russia agreed to ratify the Protocol and thus give it the minimum number of weighted votes required for it to take effect as international law. Gleneagles 2005 induced Bush to adjust his position and agree with the G8 on the important new principles that global warming was occurring, that humans were importantly responsible, that urgent action was required and that it should be taken by all members of the G8. And for St. Petersburg 2006 the G8 transformed the initial Russian concept paper on energy security, which contained only a passing reference to the environment, into an extensive summit document in which environmental protection was a dominant principle throughout. In these two years the G8 thus proved its power to adjust the behaviour of the greatest full-strength energy-demand superpower (the United States) and the greatest full-strength energy-supply superpower (Russia) in the world.

The G8's Energy-Climate Connection

Even as the G8 has effectively governed energy and climate individually, it has also brought the two together in ever more integrated, equal and environmentally-oriented ways. This process has proceeded within all four important realms of ideas, initiatives, institutionalization and inclusion, with Britain's Tony Blair and America's George Bush working through the summits they have hosted to advance the effort a great deal.

a. Intellectual Integration

The first way the G8 has connected energy and climate in a mutually beneficial way that supports sustainable development has been in constructing the ideas, or the intellectual roadmap, that charts the relative priority of and the relationship between the two.

From 1975 to 2004 the G7/8 developed a clear connection by calling for reducing carbon and greenhouse gas emissions through energy efficiency, conservation, technologies, innovation, alternatives and nuclear power. The G8 leaders got off to a strong if indirect start in 1975, as Appendices G and H suggest, by affirming the value of alternatives, conservation and the market, as well as developing supply. In 1976 they continued to emphasize conservation and efficiency over increasing supply of their own traditional energy resources. In 1977 nuclear and supply diversification were added. But at Helmut Schmidt's Bonn Summit in 1978 they strongly endorsed the increased use of coal. In 1979 they boosted coal more strongly, but now with the proviso that this be done "without damage to the environment" (G7 1979). In 1980 they added an environmental proviso to their support for nuclear energy, specified solar, synthetic fuels and other renewables as desirable sources, and endorsed a range of government subsidies and regulatory measures in the building, transportation and other fields.

The first direct connection between energy and climate came in 1979, with the declaration that "we need to expand alternative source of energy, especially those which will help to prevent further pollution, particularly increases of carbon dioxide and sulfur oxides in the atmosphere" (G7 1979). The phrase "in the atmosphere" as opposed to "into the atmosphere" suggests that the G8's seminal principle was a stabilization of CO₂ concentrations (as opposed to emissions) at 1979 levels, through a shift to alternative energy sources. From this early start of the G8's action on climate, energy was identified as the key sector to act on. Stabilization, defined as preventing further increases in concentrations, was set as the goal.

In 1989, when the G8 next made a direct link between energy and climate, it declared:

We strongly advocate common efforts to limit emissions of carbon dioxide and other greenhouse gases, which threaten to induce climate change ... We agree that increasing energy efficiency could make a substantial contribution to these goals. We urge international organizations concerned ... to improve energy conservation and, more broadly, efficiency in the use of energy of all kinds and to promote relevant techniques and technologies ... we recognize that nuclear power also plays an important role in limiting output of greenhouse gases (G7 1989).

Much as in the indirect link for the energy era starting in 1975, the direct connection for the environmental era of 1989 onward emphasized energy efficiency, conservation, technology and nuclear energy as instruments to meet the target — now relaxed from that of 1979 — to "limit" "emissions" of greenhouse gases and carbon dioxide. Houston 1990 noted:

We recognize the importance of working together to develop new technologies and methods over the coming decades to complement energy conservation and other measures to reduce carbon dioxide and other greenhouse emissions ... nuclear energy will continue to be an important contributor to our energy supply and can play a significant role in reducing the growth of greenhouse gas emissions (G7 1990).

It thus endorsed similar instruments but altered, and arguably relaxed the objective to “reduce” the growth. The resulting causal map of reducing emissions through alternatives, efficiency, conservation, technologies and nuclear was now entrenched.

With energy problems receding in the 1990s and with the UN system now charged with and engaged in climate change, the G8 next forged the link directly when Germany hosted in Cologne in 1999. In a reaffirmation of the 1990 principle, the G8 agreed: “We underline the importance of taking action to reduce greenhouse gas emissions through rational and efficient use of energy and through other cost-effective means” (G7 1999). Okinawa 2000 added the instruments of investment and renewable energy: “Working together and with existing institutions to encourage and facilitate investment in the development and use of sustainable energy, underpinned by enabling domestic environments, will assist in mitigating the problems of climate change and air pollution. To this end, the increased use of renewable energy sources in particular will improve the quality of life, especially in developing countries” (G7 2000). Evian 2003 repeated this accumulating formula, adding great detail. So did Sea Island 2004, with an emphasis on innovation through several specified new technologies such as the hydrogen economy, carbon sequestration and advanced nuclear design.

On this foundation, the 2005 Gleneagles Summit produced an epistemic revolution. Its document on “Climate Change, Clean Energy and Sustainable Development” began with the words: “We face serious and linked challenges in tackling climate change, promoting clean energy and achieving sustainable development globally” (G8 2005). It thus made the energy-climate connection the dominant frame and added urgency to the mix. It then declared fossil fuel use to be a large cause of greenhouse gas emissions (GGEs) associated with global warming. It further promised to act now to slow, stop and then reverse the growth of GGEs, to produce “substantial reductions” to stabilize GGE concentrations “at a level that prevents dangerous anthropogenic interference with the climate system.” With “transforming our energy systems” as the instrumental objective, it reaffirmed the means of investment, technologies and efficiency but added “policy, regulatory and financing frameworks,” private investment and technology transfer for developing countries and better information for business and consumers. Now climate control had become central, and energy causally primary, urgent and a subject for immediate G8 action through policy, regulatory and financing instruments to meet the goal of the safe stabilization of greenhouse gas concentrations. The 1979 target had been restored, and a much broader array of instruments mobilized to this end.

At St. Petersburg in 2006, the G8 began by affirming its goal of “ensuring sufficient, reliable and environmentally responsible supplies of energy at prices reflecting market fundamentals” and immediately proceeded to deal with it along with tackling climate change (G8 2006). It further declared: “We also reaffirm our commitment to the United Nations Framework Convention on Climate Change (UNFCCC) and to meet our shared multiple objectives of reducing greenhouse gas emissions, improving the global environment, enhancing energy security, and cutting air pollution in conjunction with our vigorous efforts to reduce energy poverty.” To be sure, its eleven energy principles reduced climate change concerns to energy efficiency and the transfer of clean energy technology. But the climate change section of its plan of action began:

We reaffirm our intention to deliver on commitments made in Gleneagles in order to meet our shared and multiple objectives of reducing greenhouse gas emissions, improving the global environment, enhancing energy security and cutting air pollution in conjunction with our vigorous efforts to reduce poverty. We also affirm our commitment to the UNFCCC's ultimate objective of stabilizing greenhouse gas concentrations in the atmosphere at a level that prevents dangerous anthropogenic interference with the climate system (G8 2006).

Gleneagles had begun with climate and included energy, while St. Petersburg began with energy and included climate. But both affirmed the same principles as the new central, urgent, comprehensive, integrated, equal, ambitious, environment-first intellectual foundation on which the G8 would now build.

Moreover, St. Petersburg's reaffirmation of the defining Gleneagles principles was encoded in the form of a commitment. One year later it was being delivered through the compliance of G8 members to a considerable degree. The preliminary version of the G8 Research Group's final compliance report found that as of May 1, 2007, this commitment to "deliver on commitments made in Gleneagles" had secured a compliance score of +67%, on a scale ranging from -100% for no or counter compliance to +100% for full compliance. Of the nine G8 members (including the European Union), all had fully complied, save for the two full-strength energy superpowers of Canada and Russia, which each registered 0% for partial compliance or a work in progress. As overall compliance with the St. Petersburg commitments was +45%, the +67% on climate change suggested the 2006 Summit had made a discernable difference there. Indeed, of the 20 priority commitments measured to produced the overall compliance score, climate change was the fifth highest, surpassed by only those for energy transparency and the Middle East at +100%, renewable energy at +89%, and the Global Partnership against Weapons and Materials of Mass Destruction at +78%. All of these higher ranked complied-with commitments were related to energy and climate. The high compliance with them overwhelmingly promoted the overall objectives that the new Gleneagles–St. Petersburg consensus set.

b. Initiatives for Integration

The second way the G8 has connected energy and climate has been in producing the big package deals that integrate previously separated issue areas and also in ways that allow for ambitious agreements based on previously unrecognized or unrealized, synergistic "win-win" solutions.

In the field of energy-climate integration, arguably the most important summit was Houston 1990. Held in America's energy capital, and hosted by George H. Bush, the summit forged the deal that made the UNFCCC possible, catalyzed the creation of the G8 environment ministers forum and produced the fundamental principle that climate change would be addressed using all sources and sinks. "All sources" broadened the concern from throughput measures such as efficiency, technology and innovation to production and resources, including the most carbon-intensive sources of wood, coal, and oil in heavy and light forms. "All sinks" accorded equal value to the world forests and agricultural lands, not as energy sources to be destroyed for fuel wood, but as something to be preserved as living things to pull carbon from the atmosphere and thus contribute to climate change control and the stabilization of concentrations goal.

A second highly successful summit for energy-climate integration was Gleneagles 2005. It produced the new intellectual consensus outlined above by inducing President George W. Bush's America to adjust to accept the new principles. The desired action followed from America and

everyone else. The G8 Research Group's final compliance report for the Gleneagles Summit showed that its central integrative climate change commitment was complied with at a level of +89%, with only Italy at 0 preventing complete compliance here. Gleneagles did secure complete compliance for its climate-related commitments on renewable energy and +67% on surface transportation. In all three cases, the U.S., Germany and the EU complied completely. Indeed, the EU at +89%, Germany at +88% and the U.S. at +81% led in overall compliance with the measured Gleneagles priority commitments. At an overall level +65%, Gleneagles was the second highest complying summit (after only Okinawa 2000), since G8 Research Group began monitoring compliance in 1996. There are thus good reasons for believing that British prime minister Tony Blair's approach to G8 summitry, energy-climate integration and dealing with a sometimes reluctant and unilateralist America worked very well. Together the Bush-Blair breakthroughs of 1990 and 2005 have been critical to the G8's energy-climate integration, equalization environment-first success.

c. Institutional Integration

The third way the G8 has connected energy and climate has been through combining energy and climate actors in G8-centred institutions of its own.

As Appendix D shows, the G8 was especially active in its early days in creating official-level, limited-duration working groups that addressed both energy and climate. It produced no fewer than five from 1979 (when it first directly recognized carbon dioxide) to 1980. Consistent with the summit's intellectual principles, these focused on conservation, alternatives and technology.

After a long absence, G8 energy-climate institutionalization resumed in 1992, 1996 and 2002 with a focus on nuclear safety. In 2000 came the innovatively multi-stakeholder if short-lived G8 Renewable Energy Task Force. Then came a step-level leap from 2003 to 2005, reaching a peak with the five official-level bodies created at George W. Bush's Sea Island Summit in 2004. Together with Blair's Gleneagles Dialogue and the bioenergy partnership in 2005, this brought G8 integrative institutionalization to a new high. It is worth noting that now George W. Bush was the great G8 integrative institutionalizer, and that the cadence was not continued into 2006.

d. Inclusiveness for Integration

The fourth way in which the G8 has connected energy and climate has been through including at the summit and ministerial levels the other consequential energy and carbon producing and consuming countries, in a balanced G8-guided way.

At the summit level, the G8 included as full members the full-strength energy-producing superpowers and now Kyoto-constrained countries of Canada in 1976 and Russia in 1998. It added as regular summit participants the Kyoto-unconstrained oil and gas powers of Nigeria and Algeria in 2001. Starting in 2003 and continuously since 2005 it added, as ongoing and increasing participants, the "Plus Five"—the Kyoto-unconstrained, energy-demand and carbon-producing superpowers of China, India, Brazil, Mexico and South Africa, most of which had considerable supplies of carbon-intensive energy of their own.

At the ministerial level, the most significant move has been the creation of the G20 finance ministers forum in 1999 (Kirton 2001b, 2005). The G20 adds to the G8 Plus Five the Kyoto-unconstrained energy producers of Saudi Arabia, Australia and Indonesia, as well as many

emerging demand powers in the next tier. Although initially focused on financial stability, the G20 added the environment to its agenda in 2000 and then took up energy, climate and the relationship between the two. At its meeting in Melbourne, Australia, on November 18-19, 2006, the G20 finance ministers addressed energy in a major way and integrated it with environmental and climate concerns. They concluded by declaring: “We discussed the links between energy and climate change policy, including the role of market-based mechanisms, and agreed that the G20 would monitor this issue” (G20 2006). The G20 has thus gotten into the energy-climate integration effort on an ongoing basis, and on the basis of much the same formula as the post-Gleneagles G8.

Conclusion

a. The Record of Rising G8 Energy-Climate Performance

The G8 has thus proven to be an effective, expanding governor of energy, climate and their connection in several ways. Ideationally, the G8’s seminal 1979 consensus on stabilizing carbon concentrations through energy conservation, efficiency, alternatives, nuclear power, investment and technological innovation was restored and reinforced in 2005-06 by a new consensus on the centrality, urgency and comprehensive nature of the energy-climate connection itself. In initiatives and their implementation, the Bush-Blair breakthroughs of 1990 and 2005 have been central in producing this new consensus and converting it into ambitious commitments and high compliance to put it into effect. Institutionally, the G8 has combined energy and climate actors in new G8-centred bodies, most vigorously in 1979-80, again from 2003 to 2005 and, above all, when George W. Bush hosted in 2004. Inclusively, the G8 at the summit and ministerial levels has increasingly involved the other consequential energy and carbon-producing and carbon-consuming countries, in a balanced G8-guided way.

b. The Causes of G8 Energy-Climate Performance

Why has the G8 has performed so well in the interconnected energy-climate domain? From the analysis above and other work explaining G8 performance, several factors stand out.

The first is shock-activated vulnerability in the energy domain, as measured by high world oil prices. The energy shocks of the 1970s and 2004-6 showed G8 powers, led by its most capable oil-short members of the U.S., Japan and Germany that they must move away from carbon-creating oil use, and toward largely cleaner fuels. Energy shocks also equalized capability within the G8, among the otherwise overall greatest powers of the U.S., Japan and Germany, and the overall small but energy rich powers of Britain and especially Canada and Russia, thus providing a basis for balanced deals to be made. Here it is important that energy rich Canada and Russia are Kyoto members, even though their superpower neighbour the U.S. is not. It might be added that while shock-activated vulnerability from terrorism generates high G8 energy performance, it does not do so on the energy-climate connection itself. The latter was forged so well at Gleneagles on the basis of American adjustment in the days before the July 7 terrorists struck in Britain. It was forged so poorly in 2002 at the first G8 summit after the September 11 terrorist attacks in the U.S.

A second cause is iteration, both in the summit agenda and in the institutionalization that gives greater continuity and depth (Bayne 1999). By 1979 when it first took up “carbon dioxide,” the G8 had a history and an official-level base for dealing with energy in a de facto carbon-

constraining way. Similarly, Bush's great outburst of energy-climate institutionalization in 2004 provided a basis on which Blair could build in 2005. The latter in turn provided the intellectual foundation on which the G8 acted, in its commitment to commit to Gleneagles, at St. Petersburg in 2006. Yet the record from 1980 to 1981 and afterward shows that iteration and institutionalization alone are not strong enough to make a difference when energy prices and economic growth plunge to the levels they did in 1981 and the immediately following years.

The third cause is the agency of individuals, especially from an experienced, skilled and committed G8 leader who serves as the summit's host. Among the two-time summit hosts, Tony Blair did nothing on energy or climate at Birmingham in 1998, amidst the competing call of the Asian-turned-global financial crisis and world oil prices dropping to US\$11 per barrel. But he did his second time at Gleneagles 2005, just as Britain was turning into a vulnerable net importer of oil and gas, and just as the science was showing global warning and its rising sea levels could be destructive for small island states around the world. In sharp contrast, Jean Chrétien, the Canadian prime minister who had previously served as energy minister — but never environment minister — of his hydrocarbon-rich country hosted in both 1995 and 2005, when world oil prices were low and financial and terrorist shocks high, and was thus not forced to learn to connect energy and climate and put his summit to work in this way. It remains a question for further research how much George W. Bush at Sea Island 2004 had learned from his father George H. Bush as host of Houston in 1990. What is nonetheless clear is that leaders can craft their commitments at a summit in ways that enhance the chances they will be complied with, and this that their premises forged and promises made will thus be turned into promises kept (Kirton 2006; Kirton *et al.* 2007).

c. Prospects for the 2007 Heiligendamm Summit's Energy-Climate Performance

As the G8's 2007 Heiligendamm Summit approaches, it appears that the right conditions are in place to have it do a great deal on the energy-climate front. This is despite the fact that when host Angela Merkel first crafted and released her G8 agenda, it gave scant attention either to energy security or to climate change and only focused the connection on the principle of energy efficiency emphasized by the G8 a third of a century ago.

First, world oil prices are again rising to the levels they reached at Gleneagles in 2005. Merkel is leading a country and community, the European Union, recently shocked by Russian-catalyzed cutoffs of the gas on which her import-dependent constituents depend. The currency and economic capabilities of her country and community are also surging, while those of the U.S. are falling back.

The agenda and institutions of 2004-06 provide an iteratively firm foundation to propel performance. They also come with a built-in target and timetable from 2005 to provide a shadow of the future and landing spot at the Japanese-hosted G8 Hokkaido Summit on July 7-9, 2008. At this summit, as the Japanese have already privately and publicly declared, climate change will be the defining issue standing far above all else.

As the key agent, Merkel comes to her first summit as host, and her second overall as a former environment minister and the political protégé of former German Chancellor Helmut Kohl. With the bonds forged on the road to and at the 2006 summit, and by the deaths of their troops from terrorism in Afghanistan (if not Iraq), she probably has some of the same ability as Tony Blair to move George Bush. This is especially the case as both Merkel and Bush assume that they most likely will both be back to do business at the summit next year.

There are thus good grounds for concluding that the Heiligendamm G8 will and can go a long way to meeting its critical challenges of getting its Kyoto-unconstrained participants to commit to commit to carbon control in the “beyond Kyoto” years ahead, and/or to actually control carbon even without a commitment, starting now.

d. Proposals to Improve the 2007 Heiligendamm Summit’s Energy-Climate Performance

To realize this potential, G8 leaders could usefully consider the value and feasibility of doing the following things:

1. *Development Assistance for Clean Energy and Climate Control.* Pledge to deliver the already promised doubling of official development assistance (ODA) to Africa and other developing countries in ways devoted to ensuring maximum carbon mitigation (rather than merely adaptation) there. Change the initial draft of their Africa document, which says they will devote their attention and ODA to many goals other than climate change control. Reorient their bilateral development assistance programs and agencies and the work of other international institutions where they are influential (such as the regional development banks and the OECD) to this end.

2. *IFI Reform for Clean Energy and Climate Control.* Instruct the IMF and World Bank, whose executive board the G8 members control, to devote their lending, conditionality and other operations and processes to move the world toward the clean energy systems and stabilized climate which the G8 has set as goals. Such a reorientation would give the IFIs the valuable 21st-century mission they are searching for in today’s globalizing world. Controlling climate, not corruption or contagion, should be the central focus for their future work.

3. *Rely on Russia.* Move clean Russian natural gas to North America to replace at the margins America’s dirty coal and Canada’s relatively high-cost heavy oil. Encourage Russia to move like Norway did, to rely on hydroelectricity and other clean renewables for domestic consumption, saving its gas and light oil for export to its neighbours and friends. Ask Russia to sell Kyoto-countable credits to its G8 partners who need them, not as a reward for the hot air it did not produce in the distant past as its Soviet-style economy collapsed but to finance new investments through joint programs of technological development to meet shared needs in critical places such as the high Arctic frontier. Employ the proven assets of the Global Partnership for clean energy, starting in the nuclear energy field.

4. *Build G8 Bodies.* Regularize the G8 energy ministers forum by having it meet annually by itself or together with the environment ministers, or both. Recreate a modern version of the 2000-01 Renewable Energy Task Force on a G8 Plus Five basis, under the joint chair of an appropriate G8 member and an appropriate Plus Five one. Invite the G20 to meet at the leaders level in an L20 to focus on the energy-climate connection, in 2007 or 2008 when the Plus Five powers of South Africa and then Brazil hold the G20 chair.

5. *Set the Proper Principles.* Start with the need to stabilize GGE concentrations at scientifically acceptable levels, and secure this target through actions on both emissions and absorption (including sequestration, capture and storage) and thus both sources and sinks. Approve a shift toward the climate friendly poles along each spectrum and where they intersect (eg. Forests as fuel-wood sources or carbon sinks, agriculture as ethanol sources or sinks).

6. *American Action.* Ask America to do what it does best in a G8 context, notably spend on R&D, technology and investment, act on renewables and build G8-centred institutions for energy-climate integration, especially those where the other “Plus 5” powers are involved. Allow America to meet part of its commitments (as the Europeans long have) as part of its new post-1992 regional communities, notably its North American and Western hemisphere “families” now institutionalized through regular summits of their own (in the way the European Community/Union has long been). Aim for an ambitious overall G8 plus 5 package that allows each to do what it can best do, rather than have each commit to do exactly the same thing across the board.

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Appendix A: The G8's Energy Performance, 1975–2006

Year	Bayne Grade	Number of Paragraphs ^a	% Paragraphs	Commitments ^b	Compliance: energy ^c (overall ^d)	G8 ministerial meetings	Official level bodies ^e
1975	A–	4	25%	3	+66% (+41%)	–	1
1976	D	1	4%	1	+66% (+35%)	–	0
1977	B–	13	15%	5	+66% (+38%)	–	1
1978	A	15	3%	17	+66% (+34%)	–	0
1979	B+	26	70%	23	+66% (+62%)	–	2
1980	C+	25	45%	25	+66% (+16%)	–	2
1981	C	11	21%	9	+66% (+27%)	–	0
1982	C	2	10%	1	+66% (+82%)	–	0
1983	B	4	9%	2	+66% (+07%)	–	0
1984	C–	3	4%	0	+66% (+35%)	–	0
1985	E	0	0	0	+66% (+20%)	–	0
1986	B+	7	15%	1	+66% (+77%)	–	1
1987	D	2	2%	0	+66% (+86%)	–	0
1988	C–	1	1%	0	+66% (–45%)	–	0
1989	B+	6	4%	1	–50% (+19%)	–	0
1990	D	11	9%	1	–14%	–	0
1991	B–	32	19%	12	0	–	0
1992	D	27	19%	16	+63%	–	1
1993	C+	7	9%	1	+75%	–	2
1994	C	11	12%	10	+100%	–	0
1995	B+	10	5%	3	+100%	–	0
1996	B	17	6%	76	+14% +29 (+36%)	17 (Moscow)	2
1997	C–	25	17%	128	+50% (+27%)	–	0
1998	B+	5	4%	89	+100 (+45%)	1 (Moscow)	1
1999	B+	10	6%	410	– (+39%)	–	0
2000	B	14	7%	711	– (+80%)	–	1
2001	B	4	4%	212	+17 (+53%)	–	0
2002	B+	29	14%	2513	+25% (+33%)	1 (Detroit)	2
2003	C+	514	18%	40	+75% (+51%)	–	1
2004	C+	415	29%	15	+78% (+55%)	–	4

2005	716	21%	77	+100% ^f (65%)	1 (London)	2
2006	130	29% ^g	132	(+48%) ^h	1 (Moscow)	1

Notes:

^a The number of paragraphs refers to all paragraphs from all documents released by the leaders at the Summit.

^b These commitments are derived from all documents released by the leaders at the summit.

^c From 1975 to 1988, the average energy score was 66%, as determined by von Furstenberg and Daniels (1992). From 1989 to 1995, the energy score is based on climate change commitments by Canada and the U.S. as determined by Kokotsis (1999).

^d Compliance is the overall compliance score of the summit. From 1975 to 1989, the scores come from von Furstenberg and Daniels (1992). The scores from 1996 to 2004 were generated by the G8 Research Group (2005, Table C).

^e Refers to official-level bodies with mandates to deal with energy-related issue areas.

^f Includes commitment on renewable energy and non-proliferation.

^g This percentage was reached using a word count, rather than a paragraph count.

^h Interim compliance score, which includes commitment on Joint Oil Data Initiative (+100%), energy intensity (+33%), renewable energy (+67%), surface transportation (+22%), climate change (+56%) and energy counter-terrorism (+0.11).

Appendix B

G8 Energy Commitments, 1975–2006

	Total	EP	EM	EC	NE	DS	NP/S	O	RDI	C	U	RE	DE	ES
1975	3	2	1	–	–	–	–	–	–	–	–	–	–	–
1976	1	–	–	1	–	–	–	–	–	–	–	–	–	–
1977	5	–	–	1	2	1	1	–	–	–	–	–	–	–
1978	17	3	–	–	2	–	–	7	1	1	2	1	–	–
1979	23	1	–	–	1	1	–	10	6	2	–	1	1	–
1980	25	3	–	3	3	3	1	5	–	7	–	–	–	–
1981	9	–	–	–	1	2	1	1	–	1	–	2	1	–
1982	1	–	–	–	–	1	–	–	–	–	–	–	–	–
1983	2	1	–	1	–	–	–	–	–	–	–	–	–	–
1984	0	–	–	–	–	–	–	–	–	–	–	–	–	–
1985	0	–	–	–	–	–	–	–	–	–	–	–	–	–
1986	1	–	–	–	–	–	1	–	–	–	–	–	–	–
1987	0	–	–	–	–	–	–	–	–	–	–	–	–	–
1988	0	–	–	–	–	–	–	–	–	–	–	–	–	–
1989	1	–	–	–	–	–	1	–	–	–	–	–	–	–
1990	1	–	–	–	–	1	–	–	–	–	–	–	–	–
1991	12	2	–	1	–	–	9	–	–	–	–	–	–	–
1992	16	–	–	–	1	2	13	–	–	–	–	–	–	–
1993	1	–	–	–	–	–	1	–	–	–	–	–	–	–
1994	10	–	–	1	–	–	9	–	–	–	–	–	–	–
1995	3	–	–	–	–	–	3	–	–	–	–	–	–	–
1996	7	–	–	–	–	–	7	–	–	–	–	–	–	–
1997	12	1	–	–	–	–	11	–	–	–	–	–	–	–
1998	8	–	2	–	–	–	6	–	–	–	–	–	–	–
1999	4	1	–	–	–	–	3	–	–	–	–	–	–	–
2000	7	–	–	–	–	–	6	–	–	–	–	1	–	–
2001	2	–	–	–	–	–	–	–	–	–	–	2	–	–
2002	25	–	–	–	–	–	24	–	–	–	–	–	1	–
2003	40	–	3	3	–	5	21	3	–	–	–	5	–	–
2004	15	–	–	–	1	–	13	–	–	–	1	–	–	–
2005	77	4	18	21	–	8	10	1	–	3	1	6	3	–
2006	130	2	16	22	5	17	16	10	1	2	–	6	16	17
	Total	EP	EM	EC	NE	DS	NP/S	O/G	RDI	C	U	RE	DE	ESC

Notes:

EP = energy problems, generally

EM = energy market; growth, development and research, investment, transparency, harmonization

EC = energy conservation, energy efficiency

NE = nuclear energy

DS = diversify energy sources, develop clean energy, develop new technologies (CO2 capture, hydrocarbon)

NP/S = non-proliferation, nuclear waste disposal, nuclear safety

O/G = oil, Joint Oil Data Initiative, gas

RDI = reduce demand of imports, energy consumption

C = coal

U = uranium

RE = renewable energy

DE = developing countries, energy development, energy poverty, access in least developed countries

NT = new technologies

ES = Energy security, energy emergency response, securing energy infrastructure

Appendix C: Compliance with G8 Energy Commitments, 1996–2005

Energy

Commitment ^a	Issue	Average	U.S.	JAP	UK	GER	FRA	ITA	CDA	RUS	EU
1996		+29%	00%	-100%	00%	+100%	+100%	00%	+100%	NA	NA
1996-S129	Nuclear Safety	+0.29	0	-1	0	+1	+1	0	+1	NA	NA
2001		+29%	+33%	+33%	+33%	+33%	+33%	+33%	+33%	00%	NA
2001-xx	GEF, renewable energy	-0.13	0	0	0	0	0	0	0	-1	NA
2001-xx	Energy ministers	+1.00	+1	+1	+1	+1	+1	+1	+1	+1	NA
2001-xx	Johannesburg, energy	0.00	0	0	0	0	0	0	0	0	NA
2003		+75%	+100%	+100%	00%	+100%	+100%	+100%	+100%	+100%	NA
2003-75	Renewable energy	+0.75	+1	+1	0	+1	+1	+1	+1	+1	NA
2004		+78%	+100%	+100%	+100%	+100%	+100%	00%	+100%	00%	+100%
2004-S2	Renewable energy	+0.78	+1	+1	+1	+1	+1	0	+1	0	+1
2005		+100%	+100%	+100%	+100%	+100%	+100%	+100%	+100%	+100%	+100%
2005-1	Renewable energy	+1.00	+1	+1	+1	+1	+1	+1	+1	+1	+1
2006		+52%	+67%	+33%	+67%	+33%	+33%	+33%	+33%	+33%	+100%
2006-76	Joint Oil Data Initiative	+1.00	+1	+1	+1	+1	+1	+1	+1	+1	+1
2006-99	Energy intensity	+0.33	0	0	+1	0	0	0	0	+1	+1
2006-116	Surface transportation	+0.22	+1	0	0	0	0	0	0	0	+1
Average ^b		+61%	+67%	+50%	+50%	+83%	+83%	+50%	+83%	+47%	+100%

Notes:

GEF: Global Environment Facility

a. Commitment number refers to the issue number listed below.

b. Annual average.

Political Security (Weapons of Mass Destruction, Terrorism, Non-Proliferation)

Commitment ^a	Issue	Average	U.S.	JAP	UK	GER	FRA	ITA	CDA	RUS	EU
2003		+100	+100%	+100%	+100%	+100%	+100%	+100%	+100%	+100%	+100%
2003-186	WMD	+1.00	+1	+1	+1	+1	+1	+1	+1	+1	+1
2004		+78	+100%	+100%	+100%	+100%	+100%	+100%	+100%	-100%	+100%
2004-S4	WMD	+0.78	+1	+1	+1	+1	+1	+1	+1	-1	+1
2005		+100	+100%	+100%	+100%	+100%	+100%	+100%	+100%	+100%	+100%
2005-11	Non-proliferation	+1.00	+1	+1	+1	+1	+1	+1	+1	+1	+1
2006		+11%	00%	00%	00%	00%	00%	00%	00%	00%	+100%
2006-263	Counter-terrorism	+0.11	0	0	0	0	0	0	0	0	+1
Average ^b		+72%	+75%	+75%	+75%	+75%	+75%	+75%	+75%	+25%	+100%

Notes:

a. Commitment refers to the issue number in the catalogue of commitments produced by the G8 Research Group (2006a).

b. Annual average.

Appendix D: G7/8 Official Level Bodies

First Cycle (8)

- 1975 **London Nuclear Suppliers Group**
- 1977 **International Nuclear Fuel Cycle Evaluation Group**
- 1979 *High Level Group on Energy Conservation and Alternative Energy*
- 1979 *International Energy Technology Group*
- 1979 *High Level Group to Review Oil Import Reduction Progress*
- 1980 *International Team to Promote Collaboration on Specific Projects on Energy Technology*
- 1980 *High Level Group to Review Result on Energy*
- 1981 Missile Technology Control Regime (MTCR)

Second Cycle (9)

- 1982 Working Group on Technology, Growth and Employment
- 1982 Consultations and Coordination on East-West Relations
- 1982 Representatives to control exports of strategic goods
- 1982 Procedures for multilateral surveillance of economic performance
- 1985 Expert Group for Foreign Ministers
- 1985 *Expert Group on Desertification and Dry Zone Grains*
- 1985 *Expert Group on Environmental Measurement*
- 1986 Group of Experts on Terrorism
- 1987 International Ethics Committee on AIDS

Third Cycle (14)

- 1989 Financial Action Task Force (FATF) (with others, secretariat from Organisation for Economic Co-operation and Development)
- 1989 International Ethics Committee on AIDS
- 1990 Chemical Action Task Force, 1990-1992 (with others)
- 1990 Task Force to Study the State of the Soviet Economy
- (1990 Permanent Working Group on Assistance to Russia)
- 1990 Gulf Crisis Financial Coordination Group
- 1992 *Nuclear Safety Working Group*
- 1992 Group of Experts on the Prevention and Treatment of AIDS
- 1993 Support Implementation Group (SIG)
- 1993 **G8 Non-Proliferation Experts Group**
- 1995 Counterterrorism Experts Group
- 1995 G7/P8 Senior Experts Group on Transnational Organized Crime (Lyon Group)
- 1995 GIP National Co-ordinators
- 1995 Development Committee Task Force on Multilateral Development Banks

Fourth Cycle (16)

- 1996 *Nuclear Safety Working Group*
- 1996 Lyon Group
- 1997 Expert Group on Financial Crime
- 1997 Subgroup on High Tech Crime (of the Lyon Group)
- 1997 *Officials Group on Forests*
- 2000 Conflict Prevention Officials Meeting (CPOM)
- 2000 *Renewable Energy Task Force*

- 2000 Digital Opportunities Task Force (Dot-Force)
- 2000 Global Fund to Fight AIDS, Malaria and Tuberculosis
- 2001 G8 Task Force on Education
- 2001 Personal Representatives for Africa (APR)
- 2002 *Energy Officials Follow-up Process***
- 2002 *G8 Global Partnership Review Mechanism***
- 2002 *G8 Nuclear Safety and Security Group***
- 2002 G8 Experts on Transport Security
- 2002 Global Health Security Laboratory Network

Fifth Cycle

- 2003 High Level Working Group on Biometrics
- 2003 Counter-Terrorism Action Group
- 2003 RadioActive Sources Working Group
- 2003 *Senior Officials for Science and Technology for Sustainable Development***
- 2003 G8 Enlarged Dialogue Meeting
- 2003 Forum for the Partnership with Africa
- 2003 Global Health Security Action Group (GHSAG) Laboratory Network
- 2003 Technical Working Group on Pandemic Influenza Preparedness
- 2004 *Global Partnership Senior Officials Group (GPSOG), January 2004***
- 2004 *Global Partnership Working Group (GPWG)***
- 2004 Global HIV Vaccine Enterprise
- 2004 Microfinance Consultative Group
- 2004 Best Practises Microfinance Training Centre
- 2004 Democracy Assistance Dialogue
- 2004 Task Force on Investment
- 2004 G8 Expert-Level Meetings on Peace Support in Africa
- 2004 Friends of the Convention on Corruption
- 2004 G8 Accelerated Response Teams on Corruption
- 2004 *International Partnership for a Hydrogen Economy (IPHE)***
- 2004 *IPHE Implementation-Liaison Committee***
- 2004 *Carbon Sequestration Leadership Forum (CSLF)***
- 2004 *Renewable Energy and Energy Efficiency Partnership (REEEP)***
- 2004 *Generation IV International Forum (GIF)***
- 2004 *Global Earth Observation System of Systems (GEOSS)*
- 2005 *Dialogue on Sustainable Energy***
- 2005 Working Group on Innovative Financing Mechanisms
- 2005 Experts on IPR Piracy and Counterfeiting
- 2005 *Global Bioenergy Partnership***
- 2005 African Dialogue Follow-up Mechanism (Africa, paragraph 33)
- 2006 G8 expert group to develop criteria and procedures for evaluating educational outcomes and qualifications
- 2006 G8 expert group on the possibilities of strengthening the international legal framework pertaining to IPR enforcement
- 2006 G8 expert, UN and other international organization group on the feasibility of implementing stabilization and reconstruction measures
- 2006 *G8 expert group on securing energy infrastructure***

Note: Excludes one-off meeting or conferences. Bodies related to energy are in bold, to environment in italics.

Appendix E: The G8's Environmental Performance, 1975–2006

	Domestic Political	Deliberative	Directional	Decisional: total com't	Decisional: money	Delivery	Dev'l Global Gov	G8RG score	Bayne score
1975	TBC	1 (0)	–	0 (0)	–	–	1	–	–
1976	TBC	1 (0)	–	1 (0)	–	–	–	–	–
1977	TBC	1 (0)	–	1 (0)	–	–	1	–	B–
1978	TBC	1 (0)	–	0 (0)	–	–	–	–	A
1979	TBC	3 (1)	–	3 (0)	–	–	3	–	B+
1980	TBC	3 (0)	–	4 (0)	–	–	2	–	C+
1981	TBC	2 (0)	–	1 (0)	–	–	–	–	–
1982	TBC	0 (0)	–	0 (0)	–	–	–	–	–
1983	TBC	2 (0)	–	1 (0)	–	–	–	–	–
1984	TBC	2 (0)	–	0 (0)	–	–	–	–	–
1985	TBC	7 (1)	–	3 (0)	–	–	1	–	–
1986	TBC	1 (0)	–	0 (0)	–	–	–	–	–
1987	TBC	3 (1)	–	3 (1)	–	(+0.50)	–	–	–
1988	TBC	4 (1)	–	0 (0)	–	(n/a)	–	–	–
1989	TBC	35 (7)	–	11 (4)	–	(–0.50)	–	–	B+
1990	TBC	18 (5)	–	27 (7)	–	(+0.14)	–	–	–
1991	TBC	26 (5)	–	18 (5)	–	(0.00)	–	–	–
1992	TBC	17 (4)	–	9 (7)	–	(+0.64)	1	–	–
1993	TBC	10 (1)	–	5 (4)	–	(+0.75)	1	–	–
1994	TBC	10 (2)	–	7 (4)	–	(+1.00)	–	–	–
1995	TBC	14 (3)	–	7 (3)	–	(+1.00)	–	–	–
1996	TBC	16 (3)	–	8 (1)	–	(+0.57)	1	B+	–
1997	TBC	22 (5)	–	22 (4)	–	(+0.50)	1	B	–
1998	TBC	5 (4)	–	11 (8)	–	(+1.00)	–	C+	–
1999	TBC	4 (1)	–	6 (3)	–	(n/a)	–	B– (B)	–
2000	TBC	8 (2)	–	12 (2)	–	(n/a)	1	B+	–
2001	TBC	9 (3)	–	12 (4)	–	(0.00)	–	n/a	–
2002	TBC	10 (0)	–	25 (0)	–	(n/a)	3	A–	–
2003	TBC	90 (2)	–	59 (2)	–	(+0.75)	1	n/a	–
2004	TBC	22 (0)	–	59 (2)	–	(+0.89)	8	–	–
2005	TBC	147 (147)	–	54 (36)	–	(+0.95)	2	–	–
2006	TBC	75 (25)	–	79 (22)	–	(+0.25)	1	(C)	–

Notes: Deliberative: the unit is the paragraph, each paragraph mentioning the environment is counted as 1. Climate change data shown in brackets.

Appendix F

Compliance with Climate Change Commitments, 1987–2006

Commitment ^a	Issue	Ave	U.S.	JAP	UK	GER	FRA	ITA	CDA	RUS	EU	Report of
1987 (1)		+29%	00%	00%	+100%	00%	00%	00%	+100%	N/A	N/A	
1987–32	Environmental problems	+0.29	0	0	+1	0	0	0	+1	N/A	N/A	EK/LS
1989 (4)^b		-39%	-100%	+100%	+100%	+100%	00%	00%	00%	N/A	N/A	
1989–1	Limit GHG ^c	+0.43	-1	+1	+1	+1	0	0	+1	N/A	N/A	EK/AL
1989–2	WMO network	-1.00	-1	N/A	N/A	N/A	N/A	N/A	-1	N/A	N/A	
1989–3	Forest management	-1.00	-1	N/A	N/A	N/A	N/A	N/A	-1	N/A	N/A	
1989–4	Convention on Climate Change	0.00	-1	N/A	N/A	N/A	N/A	N/A	+1	N/A	N/A	
1990 (7)		+14%	-43%	N/A	N/A	N/A	N/A	N/A	+14%	N/A	N/A	
1990–2	Convention on Climate Change	0.00	-1	N/A	N/A	N/A	N/A	N/A	+1	N/A	N/A	EK
1990–3	Carbon sinks	0.00	-1	N/A	N/A	N/A	N/A	N/A	+1	N/A	N/A	EK
1990–4	Forest management	0.00	+1	N/A	N/A	N/A	N/A	N/A	-1	N/A	N/A	EK
1990–5	Brazil pilot program	-1.00	-1	N/A	N/A	N/A	N/A	N/A	-1	N/A	N/A	EK
1990–6	Tropical Forestry action plan	-1.00	-1	N/A	N/A	N/A	N/A	N/A	-1	N/A	N/A	EK
1990–7	Research on climate change	+1.00	+1	N/A	N/A	N/A	N/A	N/A	+1	N/A	N/A	EK
1991 (5)		00%	-20%	N/A	N/A	N/A	N/A	N/A	+20%	N/A	N/A	
1991–1	Convention on Climate Change	0.00	-1	N/A	N/A	N/A	N/A	N/A	+1	N/A	N/A	EK
1991–2	\$ to LDCs	+0.50	+1	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	EK
1991–3	Research on CC	+0.50	+1	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	EK
1991–5	Brazil pilot program	-1.00	-1	N/A	N/A	N/A	N/A	N/A	-1	N/A	N/A	EK
1992 (7)		+64%	+43%	N/A	N/A	N/A	N/A	N/A	+86%	N/A	N/A	
1992–1	UNFCCC	+1.00	+1	N/A	N/A	N/A	N/A	N/A	+1	N/A	N/A	EK
1992–2	Global Environment Facility	0.00	-1	N/A	N/A	N/A	N/A	N/A	+1	N/A	N/A	EK
1992–3	Commission on Sustainable Development	+1.00	+1	N/A	N/A	N/A	N/A	N/A	+1	N/A	N/A	EK
1992–4	Forest management	+1.00	+1	N/A	N/A	N/A	N/A	N/A	+1	N/A	N/A	EK
1992–6	Research on climate change	+1.00	+1	N/A	N/A	N/A	N/A	N/A	+1	N/A	N/A	EK
1992–7	National action plan	-0.50	-1	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	EK
1993 (4)		+75%	+75%	N/A	N/A	N/A	N/A	N/A	+100%	N/A	N/A	
1993–1	National action plan	+1.00	+1	N/A	N/A	N/A	N/A	N/A	+1	N/A	N/A	EK
1993–2	Commission on Sustainable Development	0.00	-1	N/A	N/A	N/A	N/A	N/A	+1	N/A	N/A	EK
1993–3	Global Environment Facility	+1.00	+1	N/A	N/A	N/A	N/A	N/A	+1	N/A	N/A	EK
1993–4	Forest management	+1.00	+1	N/A	N/A	N/A	N/A	N/A	+1	N/A	N/A	EK
1994 (4)		+100%	+100%	N/A	N/A	N/A	N/A	N/A	+100%	N/A	N/A	
1994–1	National action plan	+1.00	+1	N/A	N/A	N/A	N/A	N/A	+1	N/A	N/A	EK
1994–2	CC initiatives post 2000	+1.00	+1	N/A	N/A	N/A	N/A	N/A	+1	N/A	N/A	EK
1994–3	GEF	+1.00	+1	N/A	N/A	N/A	N/A	N/A	+1	N/A	N/A	EK
1994–4	Report to Halifax	+1.00	+1	N/A	N/A	N/A	N/A	N/A	+1	N/A	N/A	EK
1995 (3)		+100%	+100%	N/A	N/A	N/A	N/A	N/A	+100%	N/A	N/A	
1995–1	Rio	+1.00	+1	N/A	N/A	N/A	N/A	N/A	+1	N/A	N/A	EK

1995-2	Conference of the Parties	+1.00	+1	N/A	N/A	N/A	N/A	N/A	+1	N/A	N/A	EK
1995-3	Commission on Sustainable Development	+1.00	+1	N/A	N/A	N/A	N/A	N/A	+1	N/A	N/A	EK
1996 (1)^d		+57%	+100%	+100%	+100%	+100%	00%	00%	00%	NA	NA	
1996-87	Conference of the Parties	+0.57	+1	+1	+1	+1	0	0	0	NA	NA	G8RG-T
1997 (1)		+50%	00%	+100%	+100%	+100%	+100%	-100%	00%	+100%	NA	
1997-8	Conference of the Parties 3	+0.50	0	+1	+1	+1	+1	-1	0	+1	NA	G8RG-T
1998 (1)		+100%	+100%	+100%	+100%	+100%	+100%	+100%	+100%	+100%	NA	
1998-34	Kyoto	+1.00	+1	+1	+1	+1	+1	+1	+1	+1	NA	G8RG-T
2001 (1)		00%	00%	00%	00%	00%	00%	00%	00%	00%	NA	
2001-xx	Conference of the Parties 6	0.00	0	0	0	0	0	0	0	0	NA	G8RG-T
2003 (1)		+75%	+100%	+100%	00%	+100%	+100%	+100%	00%	+100%	N/A	
2003-75	Renewable energy	+0.75	+1	+1	0	+1	+1	+1	+0	+1	NA	G8RG-T
2004 (2)		+89%	+100%	+100%	+100%	+100%	+100%	+50%	+100%	+50%	+100%	
2004(s)-3	GEOSS ^c	+1.00	+1	+1	+1	+1	+1	+1	+1	+1	+1	G8RG-T
2004-S2	Renewable energy	+0.78	+1	+1	+1	+1	+1	0	+1	0	+1	G8RG-T
2005 (2)		+95%	+100%	+100%	+100%	+100%	+100%	+50%	+100%	+100%	+100%	
2005-1	Renewable energy	+1.00	+1	+1	+1	+1	+1	+1	+1	+1	+1	G8RG-T
2005-2	Climate change	+0.89	+1	+1	+1	+1	+1	0	+1	+1	+1	G8RG-T
2006^e (9)		+25%	+44%	+33%	+78%	+44%	+22%	+11%	-56%	-11%	+56%	
2006-62*	Sustainable energy use	0.11	0	0	+1	+1	0	0	-1	0	0	G8RG-O
2006-99	Energy intensity	+0.33	0	0	+1	0	0	0	0	+1	+1	G8RG-T
2006-123*	Alternative energy	+0.22	+1	+1	0	+1	0	0	-1	0	0	G8RG-O
2006-116	Surface transportation	+0.22	+1	0	0	0	0	0	0	0	+1	G8RG-T
2006-116*	Surface transportation	0.00	0	0	+1	0	+1	+1	-1	-1	-1	G8RG-O
2006-156	Renewable Energy	+0.67	0	+1	+1	+1	0	0	+1	+1	+1	G8RG-T
2006-162	Climate change	+0.56	+1	+1	+1	+1	+1	0	-1	0	+1	G8RG-T
2006-165*	UNFCCC	0.00	0	0	+1	0	0	0	-1	-1	+1	G8RG-O
2006-138*	Technology	0.11	+1	0	+1	0	0	0	-1	-1	+1	G8RG-O
Average^f		+52%	+44%	+79%	+68%	+74%	+52%	+21%	+48%	+55%	+85%	

Notes:

GEOSS: Global Earth Observation System of Systems; UNFCCC = United Nations Framework Convention on Climate Change

^a Commitment refers to the issue number listed below.

^b All compliance scores from 1989 to 1995 are the work of Kokotsis (1999).

^c Greenhouse gas emissions.

^d All compliance scores from 1996 to 2006 are the work of the G8 Research Group; some compliance work in 2006 (marked with an *) was conducted by the G8 Research Group Oxford branch.

^e All 2006 compliance scores are interim, not final.

^f Annual average.

Appendix G: The G8's Energy-Climate Connection by Source, 1975–2006

	Wood	Coal	Oil	Gas	Source	Altern	Nucl'r	Hydro	Wind	Solar	Geot'l
1975					+	+					
1976											
1977			-M				+				
1978		+3	-M			+2R	+7				
1979		+7	-C,-M			+4	+2				

Notes: M=Imports, C= consumption

Nuclear includes uranium

Alternatives includes renewables (R), develop other sources

Appendix H: The G8's Energy-Climate Connection by Action, 1975–2006

	Develop	Diversify	Conserve	Efficiency	Market	Prices	Ratio	Target	R&D
1975			+		+				
1976	+		+	+					
1977	+	+	+						
1978	+			+		+	+	+	+
1979			+5	+	+5	-6		+12	+2

Notes: Develop includes supply, increase production, strategic petroleum reserve, investment

Conservation includes reducing oil consumption

Efficiency includes rational use, rationalization of use

Market includes register, certification, information, no subsidies

Ratio is that between energy uses and GDP

R&D includes technologies