Explaining Global Leadership in Climate Security for Peace: G7/8, G20 and UN Contributions in Compliance and Accountability

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Introduction

Climate change is the central national, human and global security challenge of the current and coming years. Along with nuclear war, it is the only security threat that could conceivably end all life on the planet for all time. Already it poses an existential threat to several low-lying small island states that are slowly sinking beneath the rising seas. Its ever more extreme weather events bring mounting death and destruction to military and civilian facilities and personnel alike. Thus the central institutions of global governance increasingly identify it as a major security threat. Controlling climate change to promote security and peace by making timely, well-tailored, ambitious international commitments and, above all, by making members comply with them is thus a compelling policy challenge now. This is especially so as the implementation of the promises made at the summit of the 21st United Nations Conference of the Parties (COP-21) to the UN Framework Convention on Climate Change (UNFCCC) in December 2015 has now begun.

The global governance of climate change was invented and initiated by the Group of Seven (G7) leaders at their fifth annual summit, held in Tokyo in June 1979, and continued by the Group of Eight (G8) with Russia added in 1998. The creation was catalyzed by the traditional security threats coming from the second oil shock and Iranian revolution, and the subsequent cadence was driven by the ensuing Soviet invasion of Afghanistan, the Iran-Iraq War, and then changes in the Cold War and other hot military conflicts in the Middle East. This G7 leadership was followed, at the leaders' level, by the UN Conference on the Environment and Development at Rio in June 1992, its subsequent sustainable development conferences through to Paris in December 2015, and then the new Group of Twenty (G20) summit of systemically significant countries starting in November 2008. Together they produced a formidable combination of global leadership by international institutions, embracing the world's leading powers, directly governed by the heads of the member countries.

Yet this combined leadership has remained inadequate in delivering the needed climate change control in several ways. The most obvious is the failure of the UN's Paris Summit to produce the commitments necessary to meet its agreed goal of keeping the rise in global warming below 2 degrees Celsius — ideally below 1.5 degrees Celsius — above pre-industrial levels, even if all members completely complied with all the formal and voluntary commitments they made there. The second is the recurrent failure of UN members to comply with the climate change commitments made by their leaders at UN summits, whether expressed in informal, soft law form or as formal, hard law conventions and protocols such as the central UNFCCC and its Kyoto Protocol. The third is the failure of UN summitry to adopt the whole of global governance approach required to control the pervasive dynamics of climate change, even on the most visible, closest climate-health connection, let

alone the increasingly obvious and accepted link to conflict, security and peace (Kirton et al. 2014). Indeed, the 31-page Paris Agreement made only one brief reference to health and only one to security, in the form of food security, despite the UN's foundational, charter-enshrined, core mission of promoting peace that it was created to do in 1945.

It is thus useful to return to the international institution that historically led the global governance of climate change in order to assess whether the G7/8 since 1979 and its newer companion G20 since 2008 did better in forging the link between climate and security and in complying with their commitments and, on this basis, considering how their performance can be improved.

This paper takes up these tasks. Its threefold task is to chart the climate change commitments of the G7/8 and G20 summits since their start, assess the compliance of their members with them, and identify the causes of compliance, particularly those that constitute accountability mechanisms that the leaders control and can improve. In doing so this paper builds on the results of the full-scale research project reported in John Kirton and Ella Kokotsis's *The Global Governance of Climate Change: G7, G20 and UN Contributions*, published in 2015. It adds new data, focuses on the security link and the performance dimension of compliance and, above all, analytically develops and assesses the causal impact of 10 accountability mechanisms that summit leaders control and can use to comply more effectively.

This paper argues that the G7/8 increasingly made climate change commitments since 1985 with a peak of 55 in 2008, but only 16 of its 332 commitments were linked to security, and these largely to energy security from 2006 to 2008. Compliance with the 74 assessed climate change commitments averaged about 73%, close to the G7/8's all-issue average, but the one assessed security-linked climate commitment was 78%. G7/8 climate compliance was improved by the accountability mechanisms of more companion commitments and the commitment catalyst of a specified agent; it was very strongly improved by a set-up environment ministers meeting; it was also improved by post-summit support from a official body, a little by subsequent UN summit support the same year and, possibly, by civil society participation and autonomous assessment. However, it was lowered very strongly by the catalyst of a country or regional specification. The G20 summit made 49 climate commitments, peaking at 11 in 2013 and declining since, but none had a security link. Compliance averaged 68%, well below the G20's all-issue average of 72% and the G7/8 climate average of 75%. Compliance was improved by fewer companion climate commitments; strongly by the catalyst of international law and very strongly by iteration and multiple iteration; it was also improved by a finance ministerial meeting set-up and, possibly, by a UNFCCC summit the same year (as happened in 2009 and 2012). To improve climate change compliance, the G7/8 should thus make more climate commitments each year, have regular environment ministers' meetings (after its 2016 restart), and specify an agent to ensure compliance. In contrast, the more poorly performing G20 should persistently commit only to support the UNFCCC, but expand its finance ministers' climate agenda (as it did in February 2016) and possibly add an annual environment ministers' meeting to the energy one it started in 2015.

Through these findings, this paper makes several contributions to the existing literature. First, it extends the rich scholarship on the implementation of formal, legal international environmental agreements by systematically charting the course and causes of the climate change commitments and compliance of informal international institutions, above all the central global summits of the G7/8 and its G20 companion arriving in 2008 (Breitmeier 2008; Haas 2002; Huang 2009). Second, it builds on earlier work assessing how global summits, delivered by national leaders uniquely responsible for governing and integrating all issues actually link climate change and health, to see how they link climate change to the substantively more remote and more recently recognized domain of security, conflict prevention and peace (Kirton et al. 2014). Third, it assesses how compliance with

such climate change commitments and climate-security commitments can by improved by leaders through the use and improvement of accountability mechanisms directly under their collective control.

To conduct this analysis, this paper first examines the G7/8, exploring in turn its climate change commitments, their security links, compliance, and the impact of the accountability mechanisms that could affect compliance. Second, it examines the G20, again exploring in turn its climate change and now energy commitments, compliance, and the accountability mechanisms used. It concludes by summarizing the key findings and suggesting how G7/8 and G20 governors could act to increase the compliance they presumably want and forge a closer link to the goals of security, peace and conflict prevention that they want as well.

G7/8 Climate Change Commitment

The G7/8 started making climate change commitments in 1985, 10 years after the G7/8 summit's formal inception (see Appendix A). From 1985 to 2014, it produced 332 such commitments. In its first phase until 2005, it generated relatively few, peaking at nine at Denver in 1997. The second phase from 2005 to 2009 saw a significant expansion to 30 in 2005, 21 in 2006, 49 in 2007, a peak of 55 in 2008, and 43 in 2009. The third phase declined to 11 in 2010, seven in 2011, five in 2012, but then rose to 12 in 2013 and 16 in 2014.

Climate change commitments came in 53 separate component issues (Kirton and Kokotsis 2015). They were led by emissions reductions at 23, technology at 18, sustainable development at 17, and the UNFCCC, greenhouse gases and national action plans at 15 each. There were 16 climate-related subjects with a single commitment: the Copenhagen Accord from COP-15 in 2009, mid-term goals, a sectoral approach, pollution, the inclusion of major economies, the Global Climate Observing System, awareness, dialogue, monitoring, developed country technology, global warming, the polluter-pays principle, post-2000 initiatives, carbon sinks, the World Meteorological Organization network, and environmental problems. The more specific, technology- and energy-related subjects tend to cluster from 2005 onward, with the more general, value- or goal-based subjects more prevalent prior to 2005. None focused on national, human or global security.

There was little linking of climate and security. Of the 332 climate change commitments, only 16 or 5% referred to "security" and none to "conflict" or "peace." There were none during the G8's conflict prevention phase from 1999 to 2002 (Powell and Stephens 2002). The security-linked climate commitments appeared first in 2006 at the Russian-hosted St. Petersburg Summit with three such commitments that constituted 14% of the 21 climate change commitments made there. At Germany's Heiligendamm Summit in 2007, they doubled to six security-related climate commitments, or 12% of the 49 climate change commitments overall. After this peak, in 2008 Japan produced five security-related climate change commitments, or 9% of the 55. There were none in 2009, one of 10 for 10% at Muskoka in 2010, one of seven in 2011, and none in 2012, 2013, 2014 and 2015. Even when the G8 had taken up its conflict prevention agenda from 1999 to 2002, and expanded it to embrace environmental links, climate change was absent.

Of the 16 climate change commitments with a security link, those related to energy security arose first and appeared in 15 of the 16. In 2007 the link extended to general principles, nuclear energy and the institution of the Gleneagles Dialogue on Climate Change, Clean Energy and Sustainable Development. In 2008 food security appeared as the link. In 2011 water was added, within a water-food-energy combination, in the institutional form of the Bonn Conference on Water, Energy and Food Security. But such expansions and the link itself then died.

G7/8 Climate Change Compliance

Compliance with the climate change commitments was substantial and rising (see Appendix A). The 74 commitments assessed for compliance averaged +0.45 on the scientific scale or 73% on the popular scale, just below the G7/8's all-issue average of 0.49 or 75%.[1] By year, higher climate compliance came in 1992–94, 2002–05, a little less so in 2006–09 and 1998 with a perfect peak. Negative scores came in 1989 at –0.07, 1990 at –0.11 and 1999 at –0.22.

Climate compliance ranked 18th across issue areas. It came below transparency and the Heiligendamm Process each at +1.00 (100%), macroeconomic and social policy each at +0.71 (85.5%), information and communications technologies at +0.69 (84.5%), energy at +0.63 (81.5%), gender at +0.68 (84%), regional security and terrorism each at +0.60 (80%), environment at +0.57 (78.5%), democracy at +0.54 (77%), food/agriculture and financial crisis/regulation each at +0.53 (76.5%), health and labour/employment each at +0.52 (76%), conflict prevention at +0.51 (75.5%), and nuclear safety at +0.50 (75%). It tied with the security subjects of non-proliferation and crime/corruption. It came above Africa and development each at +0.43 (71.5%), human rights at +0.42 (71%), education at +0.41 (70.5%), trade at +0.27 (63.5%), UN reform at +0.19 (59.5%) and East-West relations at 0 (50%). This could suggest that strengthening the climate-security link could start in the cognate domains of crime/corruption and non-proliferation and the close domain of conflict prevention, perhaps also invoking the newer Nuclear Security Summit to make the climate change link.

This suggestion is supported, if very tentatively, by the fact that the one security-linked climate commitment assessed for compliance (G8 2006-162 with an energy-security link) had a score of +0.78 (89%). This is well above the average 73% for all climate commitments and the 75% for all issues as a whole.

All G7/8 members complied positively with their climate commitments. The European Union led with +0.78 (93.5%), followed by the United Kingdom at +0.66 (83%), Germany at +0.63 (81.5%), Japan at +0.53 (76.5%), Canada at +0.50 (75%), then France at +0.42 (71%), the United States at +0.34 (67%) and Russia at +0.20 (60%), with Italy trailing behind at just +0.09 (54.5%). As leadership candidates for strengthening the climate-security link, the EU and UK stand out, especially as they also complied highly on crime/corruption and conflict prevention commitments and across all commitments.

Causes of G7/8 Compliance from Accountability Mechanisms

This pattern of compliance probably had many, complex causes, some well beyond the short-term, direct control of policymakers within the international institution itself. However, they also could include those that policymakers did control and that were and can be used and improved as compliance-enhancing accountability mechanisms. Eight stand out: companion commitments, commitment catalysts, iteration, ministerial reinforcement, official body support, multilateral organizational support (from UNFCCC summits), civil society participation and autonomous assessment.

[1] The scientific scale measures compliance as −1.00 for non-compliance, 0 for a work in progress or partial compliance, and +1.00 for full compliance. Scores found at http://www.g7.utoronto.ca/compliance.

Companion Commitments

The first accountability mechanism is companion commitments, or the total number of commitments made in the same issue area at the same summit, as distinct from the ambitiousness of all or any one (von Furstenberg 2008). G7/8 leaders consciously control how many commitments, in total and across how many issue areas, they make at each of their summits. They have regularly been advised to focus on a few core subjects and commitments, in the belief that a large, diffuse production would crowd out their focus on a key set of commitments, in a priority area such as climate change, and thus make leaders and others less likely to ensure that they are implemented, monitored and complied with afterward. The far less fashionable counterarguments are that leaders do not live in such a zero-sum world of fixed attention spans. Indeed that a large number of commitments over a wide range of topics can synergistically produce win-win solutions for several subjects, especially given the close connections of climate change with energy, health, economic growth, finance and much else. In the most tightly connected space within the same issue area, the implementing synergies are likely to be most intense.

At 28 summits the G7/8 made 332 climate change commitments (or over four times the 74 assessed for compliance), but the number varied widely each year, as did the average compliance score of those assessed (see Appendix A). The 14 summits with the highest climate compliance (from +1.00 [100%] in 1998 down to +0.53 [76.5%] in 2006) had 201 climate commitments or an annual average of 14.36, with an average compliance score of +0.72 (86%) (see Appendix B). The 14 summits with the lowest climate compliance had only 131 climate commitments, at an annual average of 9.36 and an average compliance score of +0.21 (61%). The difference is even stronger if the 15th top-complying summits (with 2008's 55 commitments and +0.53 [76.5%] compliance score) is included in the first group. This strongly suggests that more companion commitments increase the average compliance with them, or "the more the merrier" as far as the intra-issue area commitment-compliance relationship is concerned. Given this relationship, further research should explore how much the total number of commitments made in cognate issue areas such as energy and in all issue areas combined at each summit affects compliance with the climate change ones.

Commitment Catalysts

The second accountability mechanism, also under the immediate, direct control of leaders who approve the final communiqués and thus the precise wording of the commitments issued in their names, is the commitment catalysts embedded in the text of each commitment. Such catalysts provide precise, authoritative obligations about how to act on, implement or comply with it (Kirton et al. 2016). There are 23 possible commitment catalysts, some of which can actually act as "inhibitors" if they in practice decrease rather than increase the subsequent compliance that comes (see Appendix C).

A multiple regression analysis across the 74 cases identified the effect of each of these 23 potential catalysts on both the overall summit average and individual member climate compliance (regression results are available upon request). It showed that only two catalysts — specified agent and country/regional specification — mattered significantly (at a confidence level of 5%) for overall average summit climate compliance. The first, specified agent, acted strongly as a compliance catalyst, having a high, positive effect on compliance at +0.73. If a particular agent is identified by leaders as responsible for the commitment, and by implication implementing it, compliance with it increases.

In contrast, the second, catalyst country/regional specification, acted very strongly as an inhibitor, having a stronger, but negative, impact on compliance at –0.94. Perhaps many of the countries or regions named in the commitment are outside the G7/8 and may need to act to produce compliance, but are not aware of and do not feel bound by the G7/8 commitment, expectations or demands,

especially if their leaders were not invited to attend the summit that made it. Moreover, given that climate change is a global problem, needing a global solution, having a commitment focus on a single geographic area while excluding all others may not be an effective approach. These results must be treated with considerable caution, as only three of the 74 assessed commitments contained the catalyst of specified agent and only two that of country/regional specification.

Each member's compliance responded to a particular catalyst cocktail. For Canada, a specified agent had a strong positive effect at +0.65. Priority placement, present in 39 of the 74 commitments, had a weak, positive effect at +0.21 (both with confidence at 10%). For France, a target — present once — was a very strong compliance inhibitor at –1.08 (10% confidence). For Germany, country/regional specification — present twice — was a strong inhibitor at –0.78 (5% confidence). For Japan, the private sector — present four times — was a weak inhibitor at –0.49 (10% confidence). For the EU (attending summits that made a total of 45 commitments), international law — present in 49% of the 74 total commitments — was present in 22 commitments, making it a moderately weak inhibitor of –0.25 (10% confidence). As a very hard law, semi-supranational, large and powerful international institution, with precise rule monitoring and enforcement mechanisms, the EU may not feel bound by the G7/8's informal commitments, even though EU members constitute a majority of the group's members and the EU often leads all-issue G7/8 compliance. For Russia, present only at summits from 1997 to 2013, which made 51 climate commitments, priority placement (present in 43% of the commitments) had a moderate positive impact of +0.39 (1% confidence); specified agent had a strong positive impact of +0.72 (10% confidence); and country/regional specification had a very strong negative impact of –1.53 (10% confidence). Italy, the UK and the US had no catalysts that counted either way.

Iteration

The third accountability mechanism is iteration, defined as "how often and how long [the commitment] has been repeated in the past or will be in the future" (Kirton et al. 2016; see also Bayne 2000; Bayne 2005). Of immediate interest is the persistent "push" of same-issue commitment(s) made at the previous year's summit. Of the 74 commitments assessed for compliance, 61 had such prior iteration. Iteration had a significant impact on only Russia and the EU, both in a very weak, negative way at –0.10 (10% confidence) and –0.08 (5% confidence) respectively. Subsequent research should test the "pull" impact of subsequent-year iteration. Yet it may be that innovation, not iteration, makes for better performance at a summit where a new host with important agenda-setting prerogatives takes charge each year, and where no multi-year "troika" of immediate-past, present and immediate-future hosts exists.

Ministerial Reinforcement

The fourth accountability mechanism is ministerial support, provided either immediately before, after or during the summit year, by the G7/8's ministerial body substantively closest to the issue. For climate change, it is the environment and energy ministers' ones. It was measured by pre-summit, or "set-up," ministerial meetings, as these identify the most salient issues and what can be realistically implemented, mobilize resources in advance and advise their often busy summit leaders who often accept the advice.

The 14 highest complying summits (averaging +0.72 or 86.%) had 13 set-up ministerials, or 0.93 meetings on average. The bottom 14 (averaging +0.21 or 61%) had seven (nearly half) or 0.5 meetings on average. Set-up ministerials thus seem to have a strong, positive compliance impact. This is even more pronounced if the 15th-ranked summit — 2008 with +0.53 or 76.5% compliance and two set-up ministerials — is included in the top tier. However, it is the presence of one same-subject

set-up ministerial that matters, and not the number of such meetings. Moreover, the presence of the catalyst of ministers in the individual commitment had no compliance effect, as noted above.

Official Body Support

The fifth accountability mechanism is official body support, the year before, during or after the summit making the commitment. Such support can come from G7/8 intergovernmental official-level forums, working groups, experts' groups and task forces created by the G7/8 to handle particular issues, or to inform G7/8 policy on climate change. Twelve such bodies were created within the year after the summit making the related climate change commitments: two for climate change (general) in 1985, one for the Global Earth Observation System of Systems (GEOSS) in 2004, four for renewable energy in 2004, one for the Gleneagles Dialogue in 2005, one for energy in 2006 and again in 2007, one for assisting developing countries in 2008, and one for forests in 2009. All these bodies were created in years (except one) that had the highest compliance (2004–09). However, the compliance catalyst of institutional body in a specific commitment had no impact on compliance.

Multilateral Support from UN Summitry

The sixth accountability mechanism is multilateral support from UN summitry. It can increase compliance in two ways: first, if the G7/8 summit commitment subsequently supports what the UN had previously promised in soft or hard law form and, second, if the G7/8 summit leads and the UN supportively follows by helping implement the commitments the G7/8 had pioneered. Multilateral organizational failure has been offered as the second cause of successful G7/8 performance in the concert equality model developed since 1989 (Kirton 1993; see also Kokotsis 1999). Yet the catalyst of core multilateral organization, in contrast to the findings of previous studies on G7/8 compliance in finance, development and health, had no compliance-increasing effect in climate change (Kirton 2006). This is perhaps because the UN system has no strong, stand-alone functional organization dedicated to climate change or the environment, as it does for finance, development, health, food and agriculture and for other parts of the firmament created in the 1940s. At the summit level, however, the UN may help raise G7/8 climate compliance, especially with the increasing frequency of sustainable development summits since 1992 and specifically those on climate change mounted by the UNFCCC in 1996, 2000, 2002, 2009 and 2012, followed by Paris in December 2015.

Such summits do seem to have a moderate compliance-enhancing effect when they subsequently, supportively follow the G7/8 one (see Appendix B). There were five UNFCCC-produced climate-specific summits following an annual climate-committing G7/8 summit in the 28 years since 1985 (or in 18% of them). Of the five, three come in the top half and two in the bottom half of compliance-performing G7/8 summits. Compliance averages 0.21 at summits for the top scoring half and 0.14 for the bottom scoring half.

A more specific analysis shows that when the G7/8 summit leads in one year and a UN summit follows the next year, G7/8 compliance averages only +0.25, or well below its overall climate average of +0.45 (72.5%) (see Appendix D). Conversely, when the UN leads with a climate change summit in one year and the G7/8 follows with commitments and compliance with them in the following year, this G7/8 compliance still averages only +0.35 (67.5%) that year. Only when the G7/8 commits in one year (usually in the late spring or early summer) and a UN climate summit follows in the same year (usually in November or December) does G7/8 compliance with its same-year commitments average a higher +0.53 (76.5%). Thus only short-term, same-year, six-month, subsequent UN climate summit support for G7/8-led climate commitments raise G7/8 compliance, and only by +0.08 points.

Further research would trace the link by matching the G7/8 commitments, in frequency and strength, with their substantively paired UN ones, following the method developed for relating UN compliance with its 2011 summit commitments to those made by a special CARICOM summit in 2007 on non-communicable disease (Bracht and Kulik 2016). However, in the more specific case of climate-security connected commitments, there is very little matching to be done. UN climate summits have made almost no references to security, let alone in the form of commitments. The December 2015 summit's 31-page Paris Agreement made only one security link — to food security — and not in a commitment form. It simply stated, within a page-long preamble, that the parties, "*recognizing* the specific needs and special circumstances of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate change," agreed to the text that followed (UNFCCC 2015). At the 2009 Copenhagen Summit, neither concluding document had referenced security, conflict or peace at all in any form.

Civil Society Participation

The seventh accountability mechanism is civil society participation — comprising the non-profit organizations, non-governmental organizations, civil society organizations, other international organizations, and national and grassroots organizations that relates to the G7/8. This activity can be both formal and informal. It encompasses such actions as lobbying, compliance monitoring and reporting (or advocacy assessment), information dissemination, implementation assistance, hosting of parallel summits and protest movements. It includes, for example, post-summit reporting by Amnesty International, the Jubilee 2000's human chain peaceful protest in Birmingham 1988, and the Genoa Social Forum's activities and hosted conferences in Genoa 2001.

Peter Hajnal (2002, 2007) identifies three phases of civil society participation. Phase one lasted from the G7's inception until 1983 and was defined by the mutual non-recognition of the G7 and civil society. Phase two continued for a decade until 1994, when civil society began to interact with the G7 and see it as a legitimate international actor. The third phase, beginning in 1995, continues until now, with the G7/8 recognizing and increasingly engaging with civil society. During the first phase, there were no climate commitments. During the second phase, climate compliance annually averaged +0.37 (68.5%), with two of the eight years making climate commitments showing negative compliance. During the third phase, starting after the World Wildlife Fund's pioneering accountability report compiled by Konrad von Moltke and issued at the Houston Summit, annual compliance averaged a higher +0.48 (74%), with only one of the 19 years having a negative score (Barnes 1994). This suggests that civil society participation and advocacy assessment could increase compliance and that tracing the relationship is a promising area for future research.

Autonomous Assessment

The eighth accountability mechanism is autonomous assessment by independent analytical bodies with no advocacy responsibilities in regard to the G7/8. The pioneering, most prominent one is the G7 and G8 Research Group, which has issued publicly available compliance reports containing climate compliance results on the eve of each summit since 1996 and interim compliance reports at mid-year intervals since 2002, with pre-publication stakeholder feedback added at both stages in recent years.[2] Average annual climate compliance rose from +0.36 (68%) before 1996 (with two negative years) and +0.35 (67.5%) in the next stage (with one negative year) to +0.57 (78.5%), with no negative years, in the mature phase since 2002.

[2] See G8 Information Centre at http://www.g7.utoronto.ca/compliance.

This suggests that a more systematic, and detailed process-tracing examination of the impact of autonomous analytic assessment by independent bodies is a promising area for future research. It is known that G7/8 leaders and their agents use the G7 Research Group assessments in many ways. These include reacting to reports of the results in the media, civil servants' reports on their country's summit success, and leaders themselves referencing them at the summit itself, as German chancellor Angela Merkel did at her concluding news conference at the G7 Elmau Summit she hosted in June 2015.

G20 Climate Change-Energy Commitments

The newer, broader, more diverse and economically focused G20 summit made 49 climate change commitments from its 2008 start to its ninth summit in 2014 (see Appendix E). In its first phase, from 2008 to June 2010, it made three commitments per summit. In the second phase, from November 2010 to 2013, it made eight each; in 2012 six, in 2013 a peak of 11 and in 2014 seven. In the third phase in 2015 it made only three. None ever had a link to security/conflict/peace link, even though the G20 summit increasingly dealt with energy, food and health and hard security-related subjects such as terrorist finance, the use of chemical weapons in Syria (at St. Petersburg in 2013), and terrorism as a whole (at Antalya in 2015); moreover, G20 foreign ministers met in advance of the summits since 2012 and at the 2013 one.

The G20 climate change commitments covered 10 issues, led by COP at 13, sustainable development at 10, financing/funding at seven, general climate change at six and the UNFCCC at 5. The others were hydrocarbons at three, the Rio Plus 20 conference at two, and one each for technology, reports/planning and assisting developing countries. Most commitments deal with participating in future meetings or conferences, and more general climate change topics that are more easily accepted by members. Few focused on highly defined or specific aspects of climate change that involved hard targets and dedicated resources. None were linked to national, human or global security in any form.

In the cognate area of energy, G20 summits made 95 commitments, starting and peaking at Pittsburgh in September 2009 with 16. After Toronto in June 2010 with only one, all successors had double-digit energy commitments: 14 for the November 2010 Seoul Summit, 18 for 2011 Cannes, 10 for 2012 Los Cabos, 19 for 2013 St. Petersburg and 16 for 2014 Brisbane (see Appendix E). G20 energy commitments covered data collection/publication with 19, fossil fuel subsidies with 13, clean energy technology with nine and reports/planning with seven. Six subjects had no commitments, five had one and six subjects had two, while the rest fell between two and six. The energy commitments varied more than the climate ones, were more specific and less open to interpretation, and often identified targets to meet or resources that needed to be raised.

G20 Climate Change-Energy Compliance

G20 members complied with the 26 assessed climate and energy commitments at an average of +0.41 (70.5%), slightly below the G20's all-issue average of +0.43 (71.5%). Compliance with the 12 assessed climate commitments averaged +0.35 (67.5%), well below the G7/8 climate average of +0.45 (72.5%) (see Appendix F-1). The 14 assessed G20 energy commitments averaged +0.47 (73.5%) (see Appendix F-2).

Across issue areas, G20 compliance was above average on microeconomic policy at +1.00 (100%), infrastructure at +0.95 (97.5%), labour and employment at +0.73 (85.5%), health at +0.65 (82.5%), macroeconomic policy at +0.59 (79.5%), food and agriculture at +0.49 (74.5), financial regulation and reform of the international financial institutions each at +0.48 (74%), energy at +0.47 (73.5%),

and gender at +0.44 (72%). It was below average on climate change at +0.35 (67.5%), development at +0.34 (76%), trade at +0.18 (59%), international cooperation at +0.15 (57.5%) and corruption at +0.13 (56.5%). Among the 16 areas, climate change thus ranked 11th and energy ninth.

Climate change compliance varied widely over time. The lowest scores came for April 2009 at London with –0.10 (45%) and for September 2013 at –0.20 (40%). The highest scores came in 2009 at Pittsburgh with +0.86 (93%) and for 2011 at +1.00 (100%). For energy, the lowest score arose for 2014 at +0.23 (61.5%), followed by 2009 Pittsburgh at +0.43 (71.5%) and 2010 Toronto at +0.45 (72.5%). The highest was for 2011 at +0.79 (89.5%), followed by 2012 at +0.58 (79%) and 2013 at +0.55 (77.5%).

All G20 members complied positively with the two areas combined, save for Saudi Arabia and Turkey. The highest compliance came from the UK at +0.77 (88.5%), Korea at +0.72 (86%), France at +0.68 (84%) and Mexico at +0.61 (80%). The lowest came from Saudi Arabia at –0.40 (30%), Turkey at –0.09 (45.5%), Argentina at +0.07 (53.5%) and Russia at +0.14 (57%). For climate change, the UK led at +0.75 (87.5%), followed by the EU at +0.73 (86.5%), Australia at +0.67 (83.5%), Korea at +0.64 (82%), and Germany and China both at +0.58 (79%), while lagging were Saudi Arabia at +0.63 (81.5%), Turkey at –0.25 (37.5%), Russia at +0.08 (54%) and Argentina at 0 (50%). Energy compliance was led by France at +0.86 (93%); Mexico, Korea and the UK each at +0.79 (89.5%); Brazil at +0.71 (85.5%); and the US and Indonesia each at +0.57 (78.5%), while lagging were Saudi Arabia at –0.17 (41.5%), Turkey at +0.08 (54%), Argentina at +0.14 (57%) and Canada at +0.21 (61.5%).

Causes of G20 Compliance from Accountability Mechanisms

Due to data constraints, the impact of the accountability mechanisms on compliance was done by ranking the eight summits by the four highest and four lowest average climate compliance scores.

Companion Commitments

On the first accountability mechanism, companion commitments, the top four climate-complying summits averaged +0.67 (83.5%) compliance and five commitments (out of 20) (see Appendix G). The four lowest averaged +0.04 (52%) compliance and 7.25 commitments (out of 29). Energy showed the same pattern, with its top-scoring three summits averaging +0.64 (82%) compliance and 15.67 commitments (out of 47). The "fewer the better" for focus seems to increase compliance from companion commitments in the G20, rather than the "more-the-merrier" for mutual support in the G7/8.

Commitment Catalysts

With regard to compliance catalysts, only eight of the possible 23 appeared in the 26 climate-energy commitments assessed for compliance. The eight were priority placement, remit mandate, specified agent, core international organization, international law, ministers, surveillance and core/other international organizations.

For climate change, the four highest complying summits averaged 1.50 catalysts and the lowest four 1.67. This suggests catalysts had a very weak, negative effect on compliance, as the presence of a catalyst in any given commitment might slightly decrease its compliance score. This pattern was even stronger for energy compliance, where the top four complying summits averaged 0.71 catalysts per commitment and the four lowest 1.57.

Priority placement, the most frequent catalyst in both climate and energy commitments, had no effect on compliance on climate and a weak, negative effect on energy. International law, appearing

in 50% of the climate commitments, had a very high, positive effect on climate change, but did not appear in energy.

Ministers, remit mandate, surveillance, and core/other international organizations each arose in only one of the seven lowest-scoring energy commitments. Specified agency appeared in three of the six lowest-scoring climate commitments. These catalysts might thus have had a negative impact on compliance.

Iteration

Iteration, and now multiple iteration, appear to be a high, significant positive cause of G20 compliance with energy and climate commitments. For climate change, the six commitments with the most compliance had 10 cases of iteration, or 1.67 on average, while the lowest-scoring six have five, or 0.83 on average. For energy, the highest-scoring seven had 11, or 1.57 on average while the lowest-scoring seven have five, or 0.71 on average. All four cases of iteration in the highest-scoring climate change commitments had multiple iteration (up to repetition for four years), while four of the five cases for energy had multiple iteration (up to three years). Bayne's argument thus proved right in the G20 summit but not the G7/8 one (Bayne 2000, 2005).

Ministerial Reinforcement

Ministerial reinforcement had a positive impact on climate compliance and a higher one for energy. It was measured by set-up meetings of the G20 finance ministers and central bank governors, which are the core ministerial body in the G20. The G20 only added an energy ministerial meeting in 2015 and has yet to do so for the environment. Finance ministerials have referred to climate change, sustainable development, green growth, energy and gas. On climate change, the four top-complying summits had eight such ministerial meetings, or an average of two per summit. The four lowest-complying summits had six, or an average of 1.5. On energy, the three top-complying summits had five meetings or an average of 1.67, while the four lowest-complying summits had three or 0.75. The actual number of such ministerials each year may matter for climate but not energy compliance.

Official Body Support

Official-level bodies dedicated to the environment or energy arose first in 2009 and above all in 2013 (see Appendix H). Their meetings in 2013 may have raised compliance with the 2012 energy commitments, whose average score was the second highest at +0.58 (79%), while 2013 was a close +0.55 (77.5%). But more data are needed to make a claim.

UN Summitry

There have only been two UNFCCC summits in the G20 summit's life to date: 2009 and 2012. Both G20 summits in the same year were top-complying ones on climate; one was in the top half and the other in the bottom half on energy. Toronto in June 2010 was traumatized by the great failure of Copenhagen's COP-15 in December 2009 (Kirton and Kokotsis 2015). On both climate and energy at Brisbane in 2014 the G20 performed well as there was no UN summit coming soon to substitute. At Antalya in November 2015, the G20 left ambitious action on climate to the UN at its Paris Summit two weeks later.

Civil Society

Civil society's impact on the G20 is more difficult to assess. Since 2010, official and spontaneous G20 engagement groups have increasingly emerged, but there is still no "E20" for either the environment or energy. The Business 20 (B20) with its sophisticated scorecard produced by the International Chamber of Commerce has largely bypassed energy and climate as topics for advocacy

and thus monitoring.[3] Energy and climate have been left to the far less focused work of the Civil 20 (C20).

Autonomous Assessment

Autonomous assessment has been done since 2008 by the G20 Research Group and its partner at the International Organisations Research Institute at the National Research University Higher School of Economics in Moscow. Its direct engagement with civil society groups, international organizations and G20 governors, and the quality of its assessments and their attention to climate and energy have steadily improved. But the climate and energy compliance of the G20 summit has not. The only leader to praise the compliance work publicly has been the UK's and G8's David Cameron in his concluding news conference at the 2012 G20 summit at Los Cabos. His country ranked first.

Conclusion

This analysis shows that the G7/8 increasingly made climate change commitments since 1985 with a peak in 55 in 2008. However, only 17 of its 332 commitments were linked to security, largely to energy security from 2006 to 2008. Compliance with the climate commitments averaged about 73%, but the one assessed security-linked climate commitment was 78%. G7/8 climate compliance was improved by the accountability mechanisms of more companion commitments and the commitment catalyst of a specified agent and very strongly by a set-up environment ministers meeting; it was also improved by post-summit support from an official body, improved a little by subsequent UN summit support the same year, and possibly improved by civil society participation and autonomous assessment; it was, however, significantly lowered by the catalyst of a country or regional specification.

The G20 summit made 49 climate commitments, with a peak of 11 in 2013 and a decline since. None had a security link. Compliance with the 12 assessed ones averaged 68%, well below the G20's all-issue average of 72% and well below the G7/8 average of 75%. Compliance seems to have been improved by fewer companion climate commitments; strongly improved by the catalyst of international law; very strongly improved by iteration and multiple iteration; it was also improved by a set-up finance ministerial meeting and, possibly, a same-year UNFCCC summit, as in 2009 and 2012.

To improve climate change compliance, the G7/8 should thus make more climate commitments each year, have regular environment ministerial meetings (after its 2016 re-start) and specify an agent to ensure compliance. In contrast, the more poorly performing G20 should consistently commit only to support the UNFCCC, but increase its finance ministers' climate agenda (as it did in February 2016) and possibly add an annual meeting of environment ministers to the energy ministerial it started in 2015.

This study makes several contributions in both the policy and scholarly realm. It shows G7/8 and G20 policymakers that they can increase compliance with their climate change commitments and identifies the several specific ways in which they can. It suggests where and how they can and should link climate change with broader and more basic security concerns. It also suggests how civil society bodies and analytical accountability assessors can contribute too.

In the scholarly realm, this study shows scholars of global governance and global environmental governance that informal, plurilateral intergovernmental institutions of the world's most powerful

[3] See ICC G20 Scorecard at http://www.iccwbo.org/global-influence/g20/reports-and-products/icc-g20-scorecard.

countries do have their members comply with the climate and energy commitments they make there and how their leaders can improve such compliance. However, many outstanding issues remain for subsequent research. Among them is to assess how the G7/8 and G20 can link climate change, if not directly with the hard core of security, conflict and peace, then with the Kantian pathways-to-peace of democracy and human rights, whose global promotion has been the distinctive foundational mission of the G7 since its start in 1975.

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Appendix A: G7/8 Climate Change Performance

	Domestic political management		Deliberation		Direction setting			Decision making	Delivery		Development of global governance		
	Communiqué compliments		Words		Priority		Human		Compliance			Outside	
Summit	#	%	#	%	placement	Democracy	rights	# commitments	Score	% assessed	Inside	# references	# bodies
1975	0	0	0	0	0	0	0	0	–	–	0	0	0
1976	0	0	0	0	0	0	0	0	–	–	0	0	0
1977	0	0	0	0	0	0	0	0	–	–	0	0	0
1978	0	0	0	0	0	0	0	0	–	–	0	0	0
1979	0	0	0	00	0	0	0	0	–	–	0	0	0
1980	0	0	0	0	0	0	0	0	–	–	0	0	0
1981	0	0	0	0	0	0	0	0	–	–	0	0	0
1982	0	0	0	0	0	0	0	0	–	–	0	0	0
1983	0	0	0	0	0	0	0	0	–	–	0	0	0
1984	0	0	0	0	0	0	0	0	–	–	0	0	0
1985	0	0	88	2.9	0	0	0	1	+0.5	100	0	0	0
1986	0	0	0	0	0	0	0	0	–	–	0	0	0
1987	0	0	85	1.5	0	0	0	1	+0.29	100	0	0	0
1988	0	0	140	2.7	0	0	0	0	–	–	0	3	2
1989	0	0	422	6	0	0	0	4	−0.07	100	0	3	2
1990	0	0	491	5.9	0	0	0	7	−0.11	57	0	2	2
1991	0	0	236	2.4	0	0	0	5	+0.38	40	0	1	1
1992	0	0	137	1.8	0	0	0	8	+0.71	43	2	2	1
1993	0	0	154	3.1	0	0	0	4	+0.57	50	0	2	2
1994	0	0	107	2.6	0	0	0	4	+0.71	50	1	0	0
1995	0	0	87	0.7	0	0	0	7	+0.29	14	1	0	0
1996	0	0	167	0.8	0	0	0	3	+0.57	33	1	2	2
1997	0	0	305	1.6	0	0	0	9	+0.29	22	1	0	0
1998	0	0	323	5.3	0	0	0	8	+1.00	30	1	0	0
1999	0	0	198	1.3	0	0	0	4	−0.22	25	1	1	1
2000	0	0	213	1.6	0	0	0	2	+0.44	25	1	1	1
2001	1	11	324	5.2	0	0	0	8	0	100	2	2	2
2002	0	0	53	0.2	3	0	0	1	+0.89	100	1	0	0
2003	0	0	62	0.3	5	0	0	4	+0.88	50	1	0	0
2004	0	0	98	0.3	0	0	0	3	+0.89	67	0	0	0
2005	0	0	2,667	9.3	10	0	0	30	+0.80	17	3	20	6
2006	0	0	1,533	3.1	2	0	0	21	+0.35	45	1	10	5
2007	4	44	4,154	12	10	0	0	49	+0.56	9	1	16	7
2008	0	0	2,568	17.5	8	0	0	55	+0.53	9	2	22	11

	Domestic political management		Deliberation		Direction setting			Decision making	Delivery		Development of global governance		
	Communiqué compliments		Words		Priority		Human		Compliance			Outside	
Summit	#	%	#	%	placement	Democracy	rights	# commitments	Score	% assessed	Inside	# references	# bodies
2009	0	0	5,559	33.3	17	5	1	43	+0.64	12	1	19	10
2010	1	11	1,282	12	1	2	0	11	+0.26	30	0	5	3
2011	0	0	1,086	5.9	1	1	0	7	+0.67	14	0	7	6
2012	0	0	789	7.1	0	0	0	5	+0.11	20	0	4	3
2013	1	11	525	3.9	0	1	0	12	+0.22	17	0	5	4
2014	0	0	747	14.6	0	0	0	16	N/A		0	7	6
Total	7		24,600		57	9	1	332	N/A		21	134	77
Average	0.17	0.02	615.43	4.16	1.4	0.42	0.03	8.0	+0.45	44.0	0.53	3.35	1.95

Notes: All data derived from documents issued in the G7/8 leaders' names at each summit. N/A = not available.
Domestic Political Management includes all communiqué compliments related to climate change, i.e., references by name to the G7/8 member(s) that specifically express gratitude in the context of climate change. % indicates how many G7/8 members received compliments in the official documents, depending on the number of full members participating.
Deliberation refers to the number of references to climate change. The unit of analysis is the paragraph. % refers to the percentage of the words in each document that relate to climate change.
Direction Setting: Priority Placement refers to the number of references to climate change in the chapeau or chair's summary; the unit of analysis is the sentence. Democracy refers to the number of references to democracy in relation to climate change. Human Rights refers to the number of references to human rights in relation to climate change. The unit of analysis for democracy and human right references is the paragraph.
Decision Making refers to the number of climate change commitments.
Delivery refers the overall compliance score for climate change commitments measured for that year. % assessed refers to percentage of commitments measured.
Development of Global Governance: Inside refers to the number of references to G7/8 environment ministers. Outside refers to the number of multilateral organizations related to climate change. The unit of analysis is the sentence.

Appendix B: G7/8 Summit-Based Causes

Year	Summit compliance score	Climate commitments per summit	Environment ministers' set-up meetings	United Nations summit
Top-complying years				
1998	+1.00	8	1	0
2002	+0.89	1	1	1
2004	+0.89	3	0	0
2003	+0.88	4	1	0
2005	+0.80	30	2	0
1992	+0.71	8	2	0
1994	+0.71	4	1	0
2011	+0.67	7	0	0
2009	+0.64	43	1	1
2014	+0.63	16	0	0
1993	+0.57	4	0	0
1996	+0.57	3	1	1
2007	+0.56	49	2	0
2006	+0.53	21	1	0
Total		201	13	3
Average	+0.72	14.36	0.93	0.21
Bottom-complying years				
2008	+0.53	55	2	0
1985	+0.50	1	0	0
2000	+0.44	2	1	0
1991	+0.40	5	0	1
1997	+0.31	9	1	0
1995	+0.29	7	1	0
1987	+0.29	1	0	0
2010	+0.26	11	0	0
2013	+0.22	12	0	0
2012	+0.11	5	0	1
2001	0	8	1	0
1989	−0.07	4	0	0
1990	−0.11	7	0	0
1999	−0.22	4	1	0
Total		131	7	2
Average	+0.21	9.36	0.50	0.14

Appendix C: List of Compliance Catalysts

1. **Priority placement:** Commitment highlighted in the preamble or stated in the chair's summary. Leaders may issue several collective documents only one of which might be an overall summary or statement of purpose; this document becomes the equivalent of the preamble in a single document.
2. **Past reference to summit:** Commitment that mentions past summits. This is considered iteration.
3. **Past reference to ministerial:** Commitment that mentions past ministerial meetings.
4. **Target:** Commitment that refers to a set goal, percentage or numerical allocation. It does not include time targets, which are considered time tables. It does include statements to fully implement a defined initiative because "fully" can be translated as 100%.
5. **Timetable single-year:** A commitment that refers to a time target, which can be short term (one year or less) or long term (more than one year). A commitment may include both short- and long-term breakdowns.
6. **Timetable multi-year:** A commitment that refers to a time target with a timetable longer than one year. It may include "by the next summit," "by 2015" or specific dates. It can also include references to words and phrases such as the Millennium Development Goals, which include well-known time targets.
7. **Self-monitoring:** A commitment where the institution in question pledges to monitor its actions on the said commitment. The institution could pledge to "monitor" or provide a report to follow up.
8. **Remit mandate:** A commitment that refers to future assessment by leaders of progress made on the commitment, most often at a future summit.
9. **Money mobilized:** A commitment that refers to funds or a set monetary value. It is also money mobilized when a commitment pledges to "increase financial support" to a specific issue.
10. **Specified agent:** A commitment that refers to a specific agent through which it will work. Even if the agent is not capitalized but the text describes a known particular thing, it is included as a specific agent. The commitment may generally refer to an agent to implement a specific action.
11. **Institutional body:** A commitment that refers to an institution that was created by the summit-level body to deal with the particular issue area.
12. **Core international organization:** A commitment that refers to a separate international organization (as an organization) focused on the issue in the commitment. The organization may be mentioned by name in relation to implementing an initiative under its control.
13. **Other international organization:** A commitment that refers to a separate international organization (as an organization) that is not the core international organization for the issue in the commitment.
14. **Regional organization:** A commitment that refers to a regional organization.
15. **International Law:** A commitment that refers generally to international law or to specific legal instruments (such as the Kyoto Protocol). Codified law and customary law are included.
16. **Ministers:** A commitment that refers to a group of ministers.
17. **International organization accountability request:** A commitment that asks international organizations to monitor the group's compliance with the commitment.
18. **Civil society:** A commitments that refers generally to working with civil society.
19. **Private sector:** A commitment that refers generally to working with the private sector, public-private partnerships, business (including the pharmaceutical industry), etc.
20. **Country or regional specification:** A commitment that refers to working with or in a particular country or region, such as Africa.

21. **Surveillance:** A commitment that requests for action or an issue to be monitored in order to collect data.
22. **International organization surveillance:** A commitment that requests a specific international organization to monitor the issue, as opposed to implement the commitment, or to provide data collection in a specific area.
23. **Core/other international organization:** A commitment that refers to the core international organization and to other international organizations.

Definitions taken from John Kirton et al. (2016).

Appendix D: UNFCCC Impact on G8 Climate Change Compliance

	Pre-G8		Post-G8		Simultaneous	
UNFCCC summit (n = 5)	Summit	Score	Summit	Score	Summit	Score
1996	1995	+0.29	1997	+0.31	1996	+0.57
2000	1999	+0.22	2001	0	2000	+0.44
2002	2001	0	2003	+0.88	2002	+0.89
2009	2008	+0.53	2010	+0.26	2009	+0.64
2012	2011	+0.67	2013	+0.22	2012	+0.11
Average	+0.25		+0.33		+0.53	

Appendix E: G20 Climate Performance

	Domestic political management		Deliberation		Direction setting			Decision making	Delivery		Development of global governance			
	Communiqué compliments		Words						Compliance		Inside		Outside	
Summit	#	%	#	%	Priority placement	Democracy	Human rights	# commitments	Score	% assessed	Ministerials	Official bodies	# references	# bodies
2008 Washington	0	0%	64	1.7	0 (0)	0	1	0 (0)	– (–)	– (–)	0	0	0	0
2009 London	0	0%	64	1.0	1 (0)	0	0	3 (0)	−0.10 (–)	33 (25)	0	0	1	1
2009 Pittsburgh	1	5%	911	9.7	4 (0)	0	0	3 (16)	+0.86 (+0.43)	33 (25)	4	0	10	4
2010 Toronto	1	5%	838	7.4	0 (0)	1	0	3 (1)	+0.42 (+0.50)	100 (100)	0	0	3	3
2010 Seoul	2	10%	2,018	12.7	2 (0)	1	0	8 (14)	+0.35 (+0.51)	25 (14)	5	3	20	11
2011 Cannes	2	10%	1,167	8.2	0 (0)	1	0	8 (18)	– (+0.61)	0 (17)	2	0	11	7
2012 Los Cabos	0	0%	1,160	9.1	0 (1)	1	0	6 (10)	+0.38 (+0.58)	40 (10)	1	5	6	5
2013 St. Petersburg	1	5%	1,697	5.9	1 (0)	0	0	11 (14)	−0.20 (+0.55)	9 (7)	0	3	10	7
2014 Brisbane	0	0%	323	3.5	0(0)	0	0	7 (16)	N/A	N/A	0	0	4	2
Total	7		8,242		8 (1)	4	1	49 (89)			12	11	65	40
Average	0.78	4%	916	6.6	0.88 (0.11)	0.4	0.1	5.4 (9.8)	+0.31 (+0.52)	20 (13)	1.3	1.2	7.2	4.4

Notes: All data derived from documents issued in the G20 leaders' names at each summit. N/A = not available.
Domestic Political Management includes all communiqué compliments related to climate change, i.e., references by name to the G20 member(s) that specifically expresses gratitude in the context of climate change. % indicates how many G20 members received compliments in the official documents, depending on the number of full members participating.
Deliberation refers to the number of references to climate change. The unit of analysis is the paragraph. % refers to the percentage of the words in each document that relate to climate change.
Direction Setting: Priority Placement refers to the number of references to climate change in the chair's summary; the unit of analysis is the sentence. The number in parenthesis refers to the number of references to the environment. Democracy refers to the number of references to democracy in relation to climate change. Human Rights refers to the number of references to human rights in relation to climate change. The unit of analysis for democracy and human right references is the paragraph.
Decision Making refers to the number of climate change commitments. The number in parenthesis refers to the number of energy commitments.
Delivery refers the overall compliance score for climate change commitments measured for that year. % assessed refers to percentage of commitments measured. The numbers in parenthesis refer to energy commitments.
Development of Global Governance: Inside refers to the number of references to institutions inside the G20 related to climate change. Outside refers to the number of multilateral organizations related to climate change. The unit of analysis is the sentence.

Appendix F-1: G20 Climate Change Compliance

N = 12		Average	Argentina	Australia	Brazil	Canada	China	France	Germany	India	Indonesia	Italy	Japan	Korea	Mexico	Russia	Saudi Arabia	South Africa	Turkey	United Kingdom	United States	European Union
2009L-84	We agreed to make the best possible use of investment funded by fiscal stimulus programmes towards the goal of building a resilient, sustainable, and green recovery.	−0.10	−1	0	−1	0	+1	0	0	−1	0	0	0	+1	0	−1	0	0	−1	0	0	+1
2009P-85	We will intensify our efforts, in cooperation with other parties, to reach agreement in Copenhagen through the UNFCCC negotiation. An agreement must include mitigation, adaptation, technology, and financing.	+0.86		+1	0	+1	+1	+1	+1	+1	0		+1		+1	+1			+1	+1	+1	
2010T-56	We reiterate our commitment to a green recovery and to sustainable global growth	+0.40	+1	+1	+1	+1	+1	0	0	+1	0	+1	0	+1	−1	−1	−1	0	0	+1	+1	+1
2010T-57	those of us who have associated with the Copenhagen Accord reaffirm our support for it and its implementation and call on others to associate with it.	−0.06		0	0	0	0	0	0	0	−1	0	0	0	0	0		−1		0	0	+1
2010T-58	We are committed to engage in negotiations under the UNFCCC on the basis of its objective provisions and principles including common but differentiated responsibilities and respective capabilities and are determined to ensure a successful outcome through an inclusive process at the Cancun Conferences.	+0.89	+1	+1	+1	0	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1		+1		+1	0	+1
2010S-131	"We reiterate our commitment to take strong and action-oriented measures and remain fully dedicated to UN climate change negotiations."	+0.25	−1	+1	+1	+1	+1	0	0	0	+1	+1	0	−1	+1	0	−1	−1	−1	+1	+1	+1
2010S-132	"Those of us who have associated with the Copenhagen Accord reaffirm our support for it and its implementation."	+0.47		+1	+1	+1	0	0	+1	+1	−1	−1	+1	0	+1	0		0		+1	+1	+1
2012LC-91	We reiterate our commitment to fight climate change and welcome the outcome of the 17th Conference of the Parties to the UN climate change conferences.	+0.70	+1	+1	+1	+1	+1	+1	+1	+1	−1	0	+1	+1	+1	+1	−1	+1	0	+1	+1	+1
2012LC-94	We [welcome international efforts in launching the Green Growth Knowledge Platform and] will continue exploring options to provide appropriate support to interested developing countries.	+0.05	−1	+1	0	0	+1	0	+1	+1	+1	−1	−1	+1	0	−1	−1	0		0	0	0
2012LC-230	We are committed to promote sustainable development and green growth and to continue our efforts to face the challenge of climate change.	+1.00	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1
2013-188	We support the operationalization of the Green Climate Fund (GCF)."	−0.20	−1	−1	−1	−1	−1	+1	+1	−1	+1	+1	+1	+1	−1	−1	−1	0	−1	+1	0	−1
2014-79	We reaffirm our support for mobilising finance for adaptation … such as the Green Climate Fund."	+0.10	0	+1	−1	+1	0	+1	0	−1	0	−1	+1	+1	+1	−1	−1	0	−1	+1	0	+1
Average		+0.35	0	+0.67	+0.25	+0.50	+0.58	+0.50	+0.58	+0.33	+0.17	+0.18	+0.50	+0.64	+0.42	−0.08	−0.63	+0.09	−0.25	+0.75	+0.50	+0.73

Note: Compiled by Caroline Bracht, December 1, 2015.

Appendix F-2: G20 Energy Compliance

Summit	Commitment	Average	Argentina	Australia	Brazil	Canada	China	France	Germany	India	Indonesia	Italy	Japan	Korea	Mexico	Russia	Saudi Arabia	South Africa	Turkey	United Kingdom	United States	European Union
2009P-18	to phase out and rationalize over the medium term inefficient fossil fuel subsidies while providing targeted support for the poorest.	+0.05	0	−1	0	−1	+1	+1	0	0	+1	−1	+1	+1	+1	−1	−1	+1		−1	+1	−1
2009P-72	Increase energy market transparency and market stability by publishing complete, accurate, and timely data on oil production, consumption, refining and stock levels, as appropriate, on a regular basis, ideally monthly, beginning by January 201+0.	+0.45	0	0	0	0	0	+1	+1	0	+1	+1	+1	+1	+1	0	0	0	0	+1	+1	0
2009P-83	We commit to stimulate investment in clean energy, renewables, and energy efficiency and provide financial and technical support for such projects in developing countries.	+0.44	0	+1	+1	+1	+1	+1		+1	0		+1	0	0	−1	−1	0	0	+1	+1	1
2009P-84	[We commit to] Take steps to facilitate the diffusion or transfer of clean energy technology including by conducting joint research and building capacity.	+0.75	+1	+1	0	+1	+1	+1	+1	+1	0	+1	+1	+1	+1	+1	0	0	+1	+1	+1	0
2010T-60	[We note with appreciation the report on energy subsidies from the IEA, OPEC, OECD and World Bank. We welcome the work of Finance and Energy Ministers in delivering implementation strategies and timeframes, based on national circumstances, for the rationalization and phase out over the medium term of inefficient fossil fuel subsidies that encourage wasteful consumption, taking into account vulnerable groups and their development needs.] We also encourage continued and full implementation of country-specific strategies and will continue to review progress towards this commitment at upcoming summits.	+0.45	0	+1	+1	0	0	+1	+1	−1	0	+1	+1	+1	+1	0	+1	+1	0	+1	0	−1

Summit	Commitment	Average	Argentina	Australia	Brazil	Canada	China	France	Germany	India	Indonesia	Italy	Japan	Korea	Mexico	Russia	Saudi Arabia	South Africa	Turkey	United Kingdom	United States	European Union
2010S-127	We reaffirm our commitment to rationalize and phase-out over the medium term inefficient fossil fuel subsidies that encourage wasteful consumption, with timing based on national circumstances, while providing targeted support for the poorest.	+0.26	0	+1	+1	+1	−1	0	−1	0	0	+1	0	+1	0	+1	0	+1	−1	+1	0	
2010S-135	We will take steps to create, as appropriate, the enabling environments that are conducive to the development and deployment of energy efficiency and clean energy technologies, including policies and practices in our countries and beyond, including technical transfer and capacity building.	+0.75	0	+1	+1	+1	+1	+1	+1	+1	0	+1	+1	+1	+1	+1	−1	+1	0	+1	+1	1
2011C-236	We reaffirm our commitment to rationalise and phase-out over the medium term inefficient fossil fuel subsidies that encourage wasteful consumption, while providing targeted support for the poorest	+0.63	0	+1	+1	0	+1	+1	0	+1	0	+1	0	+1	+1	+1		+1	0	+1	0	1
2011C-242	We commit to encouraging effective policies that overcome barriers to efficiency, or otherwise spur innovation and deployment of clean and efficient energy technologies.	+0.95	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	0	+1	+1	1
2011C-252	We stand ready to work towards operationalization of the Green Climate Fund as part of a balanced outcome in Durban, building upon the report of the Transitional Committee	+0.25	0	+1	+1	−1	+1	0	+1	+1	+1	0	−1	+1	+1	0	−1	0	0	+1	−1	0
2012LC-96	We reaffirm our commitment to rationalize and phase out inefficient fossil fuel subsides that encourage wasteful consumption over the medium term while providing targeted support for the poorest.	+0.58	0	+1	+1	0	+1	+1	0	+1	0	0	0	+1	+1	+1		+1	0	+1	0	1
2013-12	We commit] to take steps to support the development of cleaner and more efficient energy technologies to enhance the efficiency of markets and shift towards a more sustainable energy future."	+0.55	0	−1	+1	0	+1	+1	+1	+1	+1	0	0	0	+1	+1	0	0	+1	+1	+1	1

Summit	Commitment	Average	Argentina	Australia	Brazil	Canada	China	France	Germany	India	Indonesia	Italy	Japan	Korea	Mexico	Russia	Saudi Arabia	South Africa	Turkey	United Kingdom	United States	European Union
2014-73	We reaffirm our commitment to rationalise and phase out inefficient fossil fuel subsidies that encourage wasteful consumption, recognising the need o support the poor."	−0.45	−1	−1	0	−1	−1	+1	−1	0	0	−1	−1	0	0	−1	−1	−1	−1	0	+1	0
2014-203	[G20 countries, agree to work together to:] Encourage and facilitate the design, development, demonstration [of innovative energy technologies, including clean energy technologies.]	+0.90	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	−1	+1	+1	+1	1
Average		+0.47	+0.14	+0.50	+0.71	+0.21	+0.57	+0.86	+0.46	+0.57	+0.43	+0.46	+0.43	+0.79	+0.79	+0.36	−0.17	+0.36	+0.08	+0.79	+0.57	+0.38

Note: Compiled by Caroline Bracht, November 30, 2015.

Appendix G: G20 Summit-Based Causes

Year	Summit score	Climate commitments per summit	Finance ministers' meetings (pre-G20 summit)	United Nations summit (post-G20 summit)
Climate Change (n = 11)				
2011	+1.00	8	3	0
2009 Pittsburgh	+0.86	3	1	1
2010 Toronto	+0.42	3	2	0
2012	+0.38	6	2	1
Total		20	8	2
Average	+0.67	5.00	2.00	+0.50
2010 Seoul	+0.35	8	1	0
2013	−0.20	11	3	0
2009 London	−0.10	3	1	0
Total		22.00	5.00	+0.00
Average	+0.02	7.33	1.67	0
Overall average	+0.42			
Energy (n = 11)				
2011	+0.79	18	1	0
2012	+0.58	10	2	1
2013	+0.55	19	2	0
Total		47	5	1
Average	+0.64	15.67	1.67	0
2010 Seoul	+0.51	14	1	0
2010 Toronto	+0.45	1	2	0
2009 Pittsburgh	+0.43	16	0	1
2009 London				
Total		31	3	1
Average	+0.46	1+0.33	1.00	0
Energy average	+0.54			
Combined average	+0.48			

Appendix H: G20 Official Bodies for Environment and Energy

February 13–14, 2009	Officials Workshop Financing for Climate Change
February 19–20, 2013	Energy Sustainability Working Group Meeting #1
April 25, 2013	Workshop of National Energy Regulators (expert level)
April 26, 2013	Workshop on market transparency; Workshop on investment climate in the energy sector (consultations with market players and financial institutions)
June 26, 2013	Conference on commodity and energy markets
June 27–28, 2013	Energy Sustainability Working Group Meeting #2
February 10–13, 2014	Energy Sustainability Working Group Meeting #1
May 29–30, 2014	Energy Sustainability Working Group Meeting #2
August 25–28, 2014	Energy Sustainability Working Group Meeting #3
February 24–25, 2015	Energy Sustainability Working Group Meeting #1
May 21–22, 2015	Energy Sustainability Working Group Meeting #2
January 25–26, 2016	Green Finance Study Group Meeting #1
January 26, 2016	Climate Study Group Meeting #1
January 26–28, 2016	Energy Sustainability Working Group Meeting #1