

ASSESSMENT OF THE WORLD'S EFFORTS ON CLIMATE CHANGE

WORLD NUMERICAL SCORE: 2.0

1. GLOBAL CLIMATE CHANGE

Addressing global climate change is one of the paramount environmental challenges of the 21st Century. Since the beginning of the Industrial Revolution, atmospheric concentrations of carbon dioxide (CO₂), the chief heat-trapping greenhouse gas, have risen 35 percent—from about 275 parts per million by volume (ppmv) then to 370 ppmv today. This increase is mostly due to human activities, primarily the burning of fossil fuels and deforestation. Carbon that has been sequestered in the Earth's crust (in the form of oil, coal, and other fossil fuels) over millions of years has been extracted, burned, and released into the atmosphere in large quantities within the past 200 years. Atmospheric concentrations of methane (CH₄), the second leading greenhouse gas, have more than doubled over the past two centuries. Once emitted, the gases persist in the atmosphere for decades to centuries.

These changes in the composition of the Earth's atmosphere have increased the average global surface temperature by about 0.6° C (1° F) over the past 100 years. Regional climate changes due to temperature increases have already affected many physical and biological systems and the evidence suggests adverse impacts on human settlements from the increasing frequency and intensity of floods, droughts, and other severe weather events.

If the current trends in greenhouse gas emissions growth are not altered, global temperatures are expected to rise between 1.4 and 5.8° C (2.5 to 10.4° F) by 2100,¹ according to the latest assessment of the Intergovernmental Panel on Climate Change (IPCC[†]). While the precise effects of such temperature changes on agricultural production, water supply, forests, vector borne diseases and overall human development are not known, they are likely to be detrimental to a large portion of the world's population, particularly developing countries.

2. THE GOAL

The only globally agreed climate goal is set forth in the UN Framework Convention on Climate Change (UNFCCC) in 1992. The UNFCCC was signed by 160 countries at the Earth Summit in Rio de Janeiro, and presently includes 186 parties, including all major greenhouse gas-emitting countries. The objective of the UNFCCC is to *stabilize the concentration of greenhouse gases at a level that would prevent dangerous human interference with the climate system*. Stabilization, according to the Convention, must take place within a timeframe that safeguards food production, allows ecosystems to adapt naturally, and allows economic development to proceed sustainably.

Unfortunately, the UNFCCC goal is ambiguous: There is no agreement on what concentration of GHGs would actually avert dangerous climate change. To some stakeholders, such as small island states that are vulnerable to sea level rise, our current concentration of 370 ppmv is already considered demonstrably unsafe. As a practical matter, achieving stabilization at *any* concentration ultimately means reducing net global emissions dramatically; the atmosphere cannot accommodate significant net emissions from human activity and remain in balance. Stabilizing at a concentration like 450 ppmv would require emission

Figure 1. Pathways to Stabilization

CO ₂ stabilization profiles	Year in which global emissions peak	Year in which global emissions fall below 1990 level
450	2005-2015	<2000-2040
550	2020-2030	2030-2100
650	2030-2045	2055-2145
750	2040-2060	2080-2180
1000	2065-2090	2135-2270

Source: IPCC.

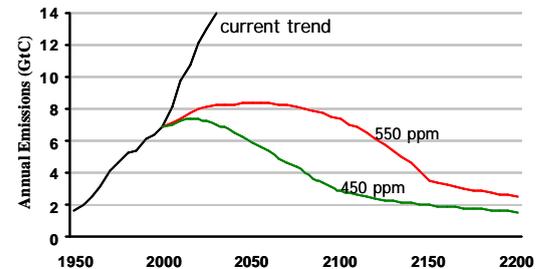
* The full range of gases includes CO₂, CH₄, N₂O, HFCs, PFCs, SF₆. These are known as "greenhouse" gases, since they trap heat that would otherwise be reflected from Earth out into space.

† The IPCC is composed of thousands of scientists and is the most authoritative global voice on the science of climate change.

reductions of 60 to 80 percent below current levels by the end of the century. Even limiting concentrations to a *doubling* of pre-industrial levels (i.e., 550 ppmv, which would likely entail significant adverse climatic impacts) would require global emission reductions to peak within the next few decades and fall below 1990 levels by the end of this century. The relationship between various emission concentrations and timing of global emission reductions are shown in Figures 1 and 2.

A 450 ppmv goal, and even a 550 ppmv goal, will be extremely difficult to meet. Over the next hundred years, the global population is expected to increase by 40 to 100 percent (from today's population of six billion) and economic growth is projected to climb 10- to 20-fold.² In the absence of concerted action, atmospheric concentrations could exceed 1000 ppmv—nearly four times pre-industrial levels, by the end of the century, with unpredictable effects on the planet. The challenge is formidable and unprecedented; meeting it will require a transition away from a global economy dependent on fossil fuels to one based on renewable and more energy-efficient technologies.

Figure 2. Stabilization Scenarios



Source: Based on IPCC.

As shown in Figure 2³, global emission forecasts suggest large future increases in emissions. Stabilizing the atmosphere at either 450 or 550 ppmv will require near term actions to slow, and then reduce, the global emissions. Our current emission trend clearly does not progress toward any reasonable goal.

This paper examines current efforts to lay the foundations for a change in the global emission trajectory on two complementary levels: the international level where multilateral processes and agreements prevail, and the national level, where individual countries can take domestic actions toward curbing their own emission levels.

3. INTERNATIONAL MILESTONES

Stabilization of GHG concentrations is a long-term goal. The physical parameters of the climate system do not allow it to be attained over the next few decades—no matter how aggressive the global effort. That said, the consequences of unconstrained emissions in the near term are critical, and the near term challenge is to put the world on an emission trajectory that makes the long-term goal attainable. The international community has developed a first response to this challenge through the adoption of the Climate Convention and the Kyoto Protocol. While insufficient on their own to eliminate the long-term threat of climate change, they represent milestones against which progress can be evaluated.

In the Climate Convention, industrialized countries pledged to return their emissions to 1990 levels by the year 2000. Collectively, this milestone was reached by industrialized countries, which reduced their overall emissions by about 1 percent over the decade. However, it was primarily due to economic stagnation in former Soviet countries (whose emissions remain far below 1990 levels) rather than policy interventions. Individually, many countries did not succeed in limiting their emissions to 1990 levels by 2000. Emissions in the U.S. for example, rose by about 18 percent over the decade. Even if all countries had individually met their targets, it was widely recognized that the Convention's pledge was environmentally insufficient.

Accordingly, governments adopted the Kyoto Protocol in 1997. The Kyoto Protocol represents progress on at least three levels: emission reductions, market mechanisms, and accountability systems. First, the Protocol commits industrialized (Annex I⁴) countries to reduce GHGs emissions below the 1990 levels during the period of 2008 to 2012. The reduction targets are "differentiated" for each Annex I member, with the European Union, Canada, and Japan committing to larger reductions (with obligations of 8%, 6% and 6% below 1990 levels, respectively). Second, the Protocol establishes market-

[‡] Annex I includes industrialized countries and countries with economies in transition (e.g., some Central and Eastern European and former Soviet states).

based trading mechanisms to help countries achieve those commitments at the lowest possible cost. Third, the Kyoto Protocol includes a set of accountability mechanisms, including provisions for greenhouse gas measurement and reporting. Procedures and mechanisms have also been agreed for dealing with potential cases of non-compliance, as well as mandatory consequences for countries found to be in violation of certain commitments.

To enter into force, the Protocol must be signed and ratified by 55 countries, whose total emissions represent a 55% share of the CO₂ emissions from Annex I countries in the year 1990. As of November 2003, 119 countries have ratified the agreement, but these countries represent only 44.2% of 1990 Annex I emissions. Ratifying Parties include many major developing countries as well as the European Union (and its members), Japan, Canada, and a few other industrialized countries.

After negotiating for more than five years and then signing the Protocol in 1997, the United States withdrew its support for the Protocol in March 2001. This makes entry into force significantly more challenging, given that the U.S. represents more than 36 percent of Annex I emissions (and more than 20 percent of global emissions). Australia has likewise declared its intent to not ratify the Protocol. As a result, entry into force of the Protocol is now entirely dependent upon whether the Russia Federation ratifies the agreement. Russia represents 17.4% of Annex I emissions; accordingly Russia's share, coupled with the 44.2% share already achieved by existing ratifications, would send the Protocol into force. Recent declarations from the Russian government suggest that ratification will not occur this year. The Kyoto Protocol would thus not enter into force in 2003.

The Convention and Protocol are laudable achievements. They establish an overall goal, short-term targets, and institutions and procedures for expanding future efforts. However, even these initial steps are in danger of failing. If the Protocol does not enter into force, and no comparable agreement is reached in the same time frame, it may be too late to avert consequences which could be dangerous[§]. Assuming it does enter into force, it has been rejected by the United States, and it contains no targets and few provisions for reining in emissions from developing countries - both regions where future emissions increases will be the largest. Furthermore, even if all developed countries fully complied with the Protocol, declining emissions in the industrialized world would likely be at least partially offset, given our global economy, by shifting of trade and investment flows. To achieve stabilization and avoid harmful impacts, significantly stronger efforts will be needed in the future.

4. NATIONAL RESPONSES

An examination of the issue at the international level only partially reveals the degree of progress toward the goal of climate protection. The adequacy of the world's efforts on climate change must also be assessed at the national level. This section presents the results of a country-level evaluation based on a survey of 20 climate change experts. The evaluation focused on twelve of the highest emitting countries: United States, European Union,^{**} Japan, Russia, Canada, and Australia from the industrialized world, and China, India, Brazil, South Korea, Mexico and South Africa from the developing world. Together, these countries account for almost 80% of the world economy, more than 70% of global emissions and 60% of global population. A description of the methodology is included in the Appendix.

Experts were asked to consider a variety of factors. First, **policies and measures** taken by countries. These include not just "national" level action, but also local and municipal actions and private sector-led initiatives. Second, steps taken by governments to improve the **information** base related to climate change. This includes reporting of greenhouse gas emissions through the UNFCCC inventory processes (i.e., national communications) as well as improving public education and awareness on climate change. Third, experts were provided with a set of **quantitative indicators of progress**, shown in Table 1.

[§] IPCC, Third Assessment Report, Working Group I

^{**} The EU is treated as one entity because the European Community (a subset of the EU) is a Party to the Convention.

Country	Responsibility / Emissions					Capability	Renewables	Political Will	
	Contribution to the global CO ₂ concentration increase (1950-2000)	Change in CO ₂ Emissions (1990 - 2000)	Emissions per Capita (tons of C equiv, 2000, all gases)	Carbon Intensity (tons of C per \$GDP-PPP, 2000)	Change in Carbon Intensity (1990-2000)	GDP per capita (\$PPP, 2000)	share of renewables in electricity mix (2000)	Kyoto Protocol Ratification	Sub-mission of National Communication
Australia	1 %	26 %	6.6	193	-11.4 %	25,693	9 %	No	Yes
Canada	2 %	22 %	6.0	172	-7.8 %	27,840	61 %	Yes	Yes
EU	17 %	0 %	2.9	99	-18.1 %	23,645	15 %	Yes	Yes
Japan	5 %	12 %	2.8	104	-2.4 %	26,755	10 %	Yes	Yes
Russia	9 %	-32 %	3.8	427	2.6 %	8,406	19 %	No	Yes
US	26 %	18 %	6.6	162	-14.5 %	34,142	9 %	No	Yes
China	10 %	39 %	1.1	201	-46.8 %	3,976	17 %	Yes	No
Brazil	1 %	53 %	1.8	73	17.6 %	7,604	90 %	Yes	No
India	3 %	64 %	0.5	99	-3.6 %	2,358	14 %	Yes	No
S. Korea	1 %	85 %	3.0	185	2.1 %	17,470	2 %	Yes	Yes
Mexico	1 %	25 %	1.5	125	-11.3 %	8,985	19 %	Yes	Yes
S. Africa	1 %	17 %	2.6	200	-1.7 %	9,466	1 %	Yes	No
World	100%	14%	1.6	147	-131%	7,295	18.7%		

Collectively, these indicators serve as useful albeit imperfect proxies of national progress made in reining in greenhouse gas emissions. The indicators represent several dimensions of the climate challenge, including CO₂ emission and intensity trends, contribution to global CO₂ concentration increases (since 1950), and levels of carbon intensity and per capita GHG emissions. Indicators also capture, to a limited degree different *capabilities* (GDP per capita) of countries as well as their *political will* (Kyoto Protocol ratification and submission of official National Communication).

Table 2 shows the average ratings of the reviewers. Based on the experts' ratings and comments, countries have been divided into three tiers: higher performers (4 countries), mid-level performers (5), and under-performers (3). The results from each tier are described below, along with the "world" results.

Tier 1: Higher Performers

Higher performing countries scored 4.5 or higher. The highest average rating was received by the European Union with a 6.2.^{††} During the 1990's the EU was alone in stabilizing absolute emission levels while also enjoying substantial economic growth. As a result, EU carbon intensity dropped the fastest among industrialized countries (18%).

More than any other country or region, the EU has taken concrete steps to address climate change, including legislation establishing a GHG emissions trading system, which will begin in 2005 with or without the Kyoto Protocol. Most recently the European Council adopted a new directive on energy taxation which increases incentives to use energy more efficiently. Several member states have also ambitiously promoted renewable energy, and adopted long-term emission reduction targets. However, even with these actions, EU emissions are only barely keeping stable—and certainly a portion of this stability can be attributed to slow economic growth. Should the economy pick up, or if other countries do not take similar measures, the EU is likely to find it difficult to remain competitive in global markets while taking further actions. Thus, even though substantial action has been taken, business pressures suggest that further future actions remain uncertain - even though they will certainly be required.

Country/Region	Rating (1=low; 10=high)
European Union	6.2
China	4.9
Japan	4.8
Mexico	4.8
Canada	4.3
Brazil	3.8
India	3.6
South Africa	3.6
South Korea	3.6
Russia	2.7
United States	2.0
Australia	2.0

^{††} It should be noted that even a 6.4 (the EU's score) is well below the 9 or 10 scores that would indicate a country is currently on track (or at least doing its appropriate share) to meet the ultimate objective of the UNFCCC.

The second highest performer was China with a score of 4.9. China was recognized by the experts for the relatively slow growth in emissions relative to its rapid economic development, resulting in a massive drop in carbon intensity of almost 50 percent since 1990. This drop is in part due to the policies and measures implemented by the government, such as reduction in coal and oil subsidies between 1990 and 1995. China has also introduced tax incentives for constructing energy-efficient buildings, and now requires that all industrial boilers cogenerate electricity with their waste heat. While recognizing China's achievements and supporting China's calls for technological and financial assistance to further tackle its emissions, experts noted that China's participation in the regime is often less constructive than it could be, and that China has failed to submit its first National Communication. Furthermore, recent data from China suggest its emissions are again climbing, and future economic growth threatens to produce still higher emissions levels. Thus, while Chinese success can be measured against a backdrop of necessary new development, the climate implications remain worrisome.

Finally, Japan and Mexico complete the "higher performers" tier, each scoring a 4.8. Japan is one of the most energy efficient countries in the world. Japan managed to reduce its already low carbon intensity over the last decade. Ratification of the Kyoto Protocol was a difficult decision for Japan. Success here constitutes another sign that Japan is "committed to ringing even more out of an already very efficient economy," as one expert put it. Nonetheless, Japan is finding it increasingly difficult to sustain emissions reductions programs, and while it has adopted a series of aggressive policies over the past decade, its total emissions have grown.

Second only to China among the developing countries, Mexico's carbon intensity has dropped significantly over the past ten years. Mexico has also already submitted two National Communications, signaling a serious national consideration of GHG-related issues. However, several experts pointed toward the need for a stronger role for Mexico in the period beyond the Kyoto Protocol's 2008-2012 timeframe. While Mexico joined the OECD in 1998 (the year after Kyoto was agreed), it has so far refused to be bound by rules applying to developed countries under the agreement—originally developed on the basis of OECD membership.

Tier 2: Mid-Level Performers

Mid-level performers rated from 3.0 to 4.5 and included Canada, Brazil, India, South Africa, and South Korea.

Canada received a score of 4.3. This score recognizes Canada's ratification of the Kyoto Protocol despite its already clean energy mix (61% renewable energy), its heavy trade with the United States (and consequent risks to its medium term competitive edge), and the domestic opposition shown by powerful interest groups. Canada is currently in the process of legislating its domestic implementation of the Protocol commitments. Notwithstanding its progress on the institutional front, Canadian emissions have climbed rapidly over the past decade and policies have focused more on Kyoto ratification than on arresting the growth of domestic emissions.

Brazil scored a 3.8. Brazil has one of the world's highest shares of renewable energy in the electricity mix (90%), and has made significant strides in developing efficient urban transport systems (e.g., in Curitiba) as well as cleaner transport fuels such as ethanol. In fact, Brazil's ethanol fuel program, the world's largest renewable energy program, has kept its carbon emissions 20 percent lower than they would otherwise be and displaced half the gasoline used in cars. Brazil has furthermore completely removed its oil subsidies. However, the country's rapid growth and deforestation trends have led to higher emissions. Experts favorably cited the country's active role in the international negotiations, but noted that the lack of a National Communication and need to tackle land use change are areas where Brazil must strengthen its commitments.

Rounding out the mid-level performers, India, South Africa, and South Korea each rated 3.6. India's emissions grew rapidly from 1990 to 2000 (64%), due in part to India's economic growth and dependence on fossil fuels. However, India is taking steps to increase energy efficiency and improve the health of its energy mix. India reduced the subsidies on coal in 1990. The country has become the

world's fourth-leading user of wind power, with 950 megawatts of capacity installed by 1998, by eliminating import tariffs and by adopting a system of power purchase requirements and tax incentives. India's largest power generation utility and a few state utilities have implemented best practices for performance optimization in coal fired power plants which have resulted in the avoidance of over 7 million tons of carbon dioxide and reduced ash production between 1996 and 2001.⁴ While these important initiatives were recognized by the experts, the absence of an Indian National Communication as well as the often "regressive" stances taken in the international talks were also noted.

For both South Korea and South Africa, experts discussed the relatively high levels of per capita emissions, largely a function of economies based on resource extraction (S. Africa) and heavy industry (Korea). South Korea's rapid emissions growth (85 percent from 1990 to 2000) is a concern. Like Mexico, South Korea's status as an OECD member and high income levels prompted suggestions from some experts that South Korea "can afford to do more." Several experts went further, stating that South Korea should become an Annex I (industrialized) Party and/or adopt an emission limitation commitment in future negotiations.

Tier 3: Under-Performers

Russia, the United States, and Australia are categorized as under-performers by virtue of their low ratings (2.7 for Russia; 2.0 for the US and Australia). Along with low ratings, these countries provoked icy responses from many experts.

Seven of 20 experts gave Russia their lowest score. While Russia's emissions declined (about 32%) over the past decade, it was not sufficient to warrant a favorable overall review, given that the declines are largely due to economic deterioration and restructuring. Russia has taken virtually no steps to address climate change. Its lack of political will on climate troubled many experts, particularly in the context of the ratification of the Kyoto Protocol. Russia remains the only Annex I country that has neither ratified nor pronounced its intent *not* to ratify the agreement, leaving the international community in a prolonged state of doubt and uncertainty regarding the future of the climate regime. However, in strict climate terms, Russia is a star performer: irrespective of cause, nearly half of all global emissions reductions in the world occurred in Russia over the past decade.

Most experts gave the US or Australia the lowest scores. The U.S. is the largest contributor to the build-up of greenhouse gases in the atmosphere (about 28% of the CO₂ emissions from fossil fuels over the past century) and, as the wealthiest country in the world, is widely perceived to have significant capacity to reduce its emissions. The dominant U.S. role in world affairs and open animosity toward multilateral solutions to global problems, combined with no federal climate change legislation, renewed interest in coal burning, and even some public contempt for energy efficiency and conservation, led to near low scores. While the repudiation of the Kyoto Protocol troubled experts, the aforementioned factors seemed to contribute equally to the low ratings.

On the other hand, the United States garnered a few bright spots from some experts, especially the climate-friendly state and local level initiatives that have sprung up in the absence of meaningful federal efforts. The state of California, for example, has approved a law that will establish the first major greenhouse gas emission standards for automobiles in the country. Under this law, automakers will be required by the end of the decade to limit greenhouse gas emissions from new cars and light trucks sold in California; such sales account for about 10 percent of total U.S. auto sales. In Oregon, new power plants must be 17% below most efficient plants operating. More than twenty-five of the fifty U.S. states have laws enacted or pending to limit greenhouse gas emissions and encourage carbon sequestration. Several northeast states have enacted mandatory caps on CO₂ emissions from power plants, and are evaluating participating in a regional emissions reduction system with Canadian provinces. In October 2003, the U.S. Senate narrowly defeated legislation to cap and reduce U.S. GHG emissions, and the bill's proponents have vowed to bring it back until it passes.

Australia, which also scored a 2.0, is highly dependent on coal and has a high carbon intensity (193 tons of carbon per \$GDP), leading to one of the world's highest per capita emission levels (6.6 tons of

carbon per capita). These factors, along with the importance of the coal lobby and a predisposition against international treaties, were identified as factors contributing to Australia's decision to not ratify the Kyoto Protocol. However, Australia has at the same time announced that it will voluntarily comply with its Kyoto target even if operating outside the regime. Australia's strong institutions, ample capacity to reduce emissions, and favorable target under the Kyoto Protocol should help in achieving that goal.

5. NON STATE ACTORS

In addition to the efforts of governments around the world, some non state actors have begun to take actions to address climate change. More forward leaning multinational corporations are aware that - with or without the Kyoto Protocol - the future trend is toward less carbon intensive economies, prompting investment in energy efficiency and carbon savings. BP Amoco and Shell's voluntary greenhouse gas emission reduction plans have been widely publicized. Toyota has sharply increased its sales of hybrid vehicles. Dupont has already achieved its voluntary target of reducing its greenhouse gas emissions by 65 percent below 1990 levels, a target it had set itself for 2010.

In Europe where federal regulations are in place, local companies have necessarily begun to benchmark greenhouse gas efficiency as a component of their corporate investment strategy. In Russia, where climate policy is in early stages of development, RAO-UESR -the national electricity company- , with GHG emissions comparable to the emissions of the UK, has prepared a GHG emissions inventory and submitted that inventory to independent expert review. In the United States where no federal regulations have been implemented, some companies seeking to distinguish themselves as environmentally responsible citizens have taken voluntary emission reduction commitments. Entergy is the first U.S. electric power company to commit to stabilizing its emissions through 2005 at the year 2000 levels. Alcoa has pledged to reduce its GHG emissions by 25 % from 1990 levels by 2010, and 50 % from 1990 levels over the same period if inert anode technology succeeds. Johnson & Johnson has committed to reducing its GHGs by 7 % from 1990 levels by 2010, with an interim goal of 4 % below 1990 by 2005. Polaroid has assumed a CO₂ reduction of 20 % below 1994 by end of 2005, and 25 % by 2010.

Many non-governmental organizations in both industrialized as well as in developing countries are extremely committed to the topic, functioning as reliable sources of information, analysis and advocacy. Much of the progress of the international negotiations as well as the rising consciousness of the private sector can be ascribed to the indefatigable work of these NGOs.

However, notwithstanding the efforts - and successes - of the leaders, it is clear that global emissions continue to increase. Current voluntary actions are inadequate to stem the tide, and the patchwork efforts to refine current energy systems, while steps in the right direction, are decidedly insufficient. Addressing climate change effectively requires nothing short of radically transforming the way we produce and consume energy.

6. CONCLUSION AND GLOBAL ASSESSMENT

The world has barely begun to arrest the continued growth of global emissions, and hence has made almost no progress in lowering the expected concentrations of GHG in the atmosphere. In contrast to the specific goals of other environmental challenges such as drinking water and sanitation, climate change does not have a specific GHG concentration as an agreed target nor a defined timeline for the reductions which must undoubtedly occur. Assessments of world efforts may thus be made against two standards: (1) progress towards zeroing out emissions, as required for ANY level of stabilization of atmospheric concentrations, and (2) a more "reasonable" metric assessing institutional changes and progress under the current national and international regimes.

Using the first metric, the world might be given a rating of about 1. World emissions have risen by 14% between 1990 and 2000—and have continued to rise since—even with the economic collapse and concomitant emissions reductions in Russia and the former Soviet Union, and even with the adoption of

international agreements on climate change. While this may be a slightly slower rate than “business as usual” (hence the score above zero), it is a barely marginal improvement.

On a more “reasonable” test, and based on the discussion of institutional and national progress discussed above as well as on expert opinions, the world merits a rating of 3. No experts provided ratings of 9 or 10, which would suggest the world was on track to meet the objective of the UNFCCC. The highest rating received by the world was a 6 (3 experts); the lowest rating was a 1 (2 experts). We might conclude from this that the world has begun to take the kinds of steps that, if continued and made more robust in the future, would move the world in a more climate-friendly direction.

While these ratings are clearly not additive, it may not be unreasonable to average them, and suggest that the world score on climate change is a 2.

The scores—and the analysis—offer a number of messages:

- Addressing climate change will require a technological revolution, one that ultimately leads to a global society producing zero (or close to zero) net emissions of greenhouse gases.
- Governments have only begun to take the steps necessary to speed the transition to a carbon-neutral global economy.
- Collective action problems as well as vested interests in politically important sectors like electric power, transportation, and agriculture have so far encumbered climate protection efforts.
- Likewise, efforts to promote economic development and alleviate poverty have not yet been aligned with the longer term interests in a stable climate system.

As one expert put it, “The world community still ranks trade and economic globalization above long term climate stability.” Accordingly, “There is no way we are on the right trajectory for [safe] stabilization” of the atmosphere.

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APPENDIX

METHODOLOGY USED

For each of the countries evaluated, a set of quantitative indicators was gathered (Table 1, above). Collectively, these indicators serve as useful, but imperfect, proxies of national progress made in reining in greenhouse gas emissions. More specifically, the indicators represent important factors such as *responsibility* (contribution to global CO₂ increase since 1950, change in CO₂ emissions since 1990, current per capita GHG emissions, carbon intensity, change in carbon intensity since 1990); *capability* (GDP per capita); and *political will* (Kyoto Protocol ratification and submission of official National Communication). Whether countries have done their appropriate share to help achieve the UNFCCC objective cannot be gleaned from this data alone. Accordingly, *qualitative* factors were also identified that might illuminate the climate protection efforts being made by countries. These factors include policies and measures taken, support for and engagement in UNFCCC process, private sector/NGO/State & local engagement, and other specific needs and circumstances of a country.

On the basis of these quantitative and qualitative factors, 20 leading climate change experts from around the world, participating in their *personal capacities*, were asked to evaluate current efforts on climate change in two different ways:

1. A numerical rating between 1 and 10. A 9 or 10 would indicate that the country is currently on track to meet the objective of the UNFCCC. A 1 or 2 would indicate that the country's efforts amount to little, if any, contribution to achieving the goal. A 5 would indicate that present efforts will move the country substantially closer to the goal, particularly if efforts are sustained over time. Such a rating is necessarily a judgment call on the part of each expert, and that is exactly what this exercise sought to elicit. This evaluation is a *subjective interpretation* of world's efforts on the part of some of the most informed climate experts in the world. The intent is to produce a simple rating, compelling because of its simplicity.
2. A brief discussion of the progress (or lack thereof) in the 12 countries, based on the aggregate actions of governments, intergovernmental institutions, the private sector, and civil society. While the numerical rating is necessarily a limited exercise, this second component of the report allows for some elaboration on general issues or specific initiatives which are worthy of highlighting, due to either their exemplary nature or their negative impact on world progress.

Participants were selected based on their overall expertise on climate change. Experts come from diverse geographic regions, including North America, Europe, Africa, Asia, and Latin America. Similarly, experts represent different sectors, including academia, the private sector, non-governmental organizations, international organizations, and (current and former) government officials.

Generally, the results show that experts rated countries according to their widely varying national circumstances. In other words, not all countries were held to the same standards. This comports with the Convention's call that countries protect the climate system in accordance with their "common but *differentiated* responsibilities and capabilities." Experts cited social challenges facing South Africa, for example, as well as the need for sustainable economic development in poorer countries (with a consequent need to increase emissions in some cases).

ENDNOTES

¹ IPCC. 2001. *Synthesis Report of the IPCC Third Assessment Report*. Cambridge: Cambridge University Press.

² IPCC. 2000. *Special Report on Emission Scenarios*. N. Nakicenovic and R. Swart, eds.

³ The business as usual projection in Figure 2 is the A1B scenario described in IPCC 2000.

⁴ From: http://www.climatechangeindia.com/gep_ccs/home/home.htm