Kyoto and the COPs: Lessons Learned and Looking Ahead

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1. Prologue

This article argues that the Kyoto Protocol[1] to the 1992 United Nations Framework Convention on Climate Change[2] was doomed to fail *ab initio*. It explains why this is the case by analyzing the Kyoto Protocol's shortcomings and deficiencies. This article is divided into five parts. After the prologue in Part 1, Part 2 is devoted to the main legal, structural, and policy responses to climate change by providing an analysis of most Conferences of the Parties (COPs).[3] The Kyoto Protocol is analyzed in Part 3. Part 4 analyzes the position of the three main players in climate change: the U.S., China, and the European Union (EU). Part 5 provides some recommendations for the future.

2. Legal and Policy Responses to Climate Change

The global warming issue has been visible in the international agenda for some time. The first years were spent simply corroborating that climate change was a real and serious issue, and yet nations did not consider the need to be legally bound by international treaties in order to solve the problem. With time, there was a clear agreement among the international community that, unless nations were legally bound, there would be no

[1] Kyoto Protocol, FCCC/CP/1997/L.7/add.1, 10 December 1997, reprinted in (1998) 37 ILM 22. Currently, there are 193 Parties (192 States and 1 regional economic integration organization) to the Kyoto Protocol to the United Nations Framework Convention on Climate Change. See http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php.

[2] UNFCCC, 9 May 1992, 31 ILM 849. Currently, there are 195 Parties (194 States and 1 regional economic integration organization) to the UNFCCC. See http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php.

[3] The Conference of the Parties (COP) is the supreme body of the UN Framework Convention on Climate Change. It comprises all the 170-plus states that have ratified the Convention. It held its first session (COP-1) in Berlin in 1995 and meets on a yearly basis unless the Parties decide otherwise. The COP's role is to promote and review the implementation of the Convention. It periodically reviews existing commitments in light of the Convention's objective, new scientific findings, and the effectiveness of national climate change programs. The COP can adopt new commitments through amendments and protocols. In December 1997, at its third session (COP-3), it adopted the Kyoto Protocol, containing stronger emissions-related commitments for developed countries in the post-2000 period.

progress in addressing global warming. In the early 1990s, most countries joined an international treaty—the United Nations Framework Convention on Climate Change—to consider what could be done to reduce global warming, and how to cope with inevitable temperature increases. Years later, a number of nations approved an addition to the UNFCCC, i.e., the Kyoto Protocol, which has more powerful (and legally binding) measures.[4] In the following subsections, we shall briefly examine the legal evolution of several partial climate change agreements.

[4] For a non-exhaustive list of publications regarding international agreements on climate change, see Ackerly, B. & Vandenbergh, M. "Climate Change Justice: The Challenge for Global Governance," 20 *Geo. Int'l Envtl. L. Rev.,* 553 (2008); Aldy, J. & Stavins, R. *Post-Kyoto International Climate Policy: Summary for Policymakers, Research from the Harvard Project on International Climate Agreements*, Cambridge University Press, 2009; Aldy, J. & Stavins, Robert N. (eds.), *Architecture for Agreement: Addressing Global Climate Change in the Post-Kyoto World*, Cambridge University Press, 2007; Bessendorf, A. "Games in the Hothouse: Theoretical Dimensions in Climate Change," 28 *Suffolk Transnat'l L. Rev.*, 325 (2005); Bodansky, D. "Beyond Kyoto: Dilemmas of Climate Regulation and Equity," 102 *Am. Soc'y Int'l L. Proceedings*, 23 (2008); Bodansky, D. "The Future of Climate Governance: Creating a More Flexible Architecture," in Stewart, R. et al. (eds.), *Climate Finance: Regulatory and Funding Strategies for Climate Change and Global Development,* NYU Press, 2009; Burns, W. "Belt & Suspenders? The World Heritage Convention's Role in Confronting Climate Change," 17 *S.E. Envtl. L.J.*, 481 (2009); Carraro, C. (ed.), *International Environmental Agreements on Climate Change*, Kluwer Academic Publishers, 1999; Dernbach, J. "Achieving Early and Substantial Greenhouse Gas Reductions Under a Post-Kyoto Agreement," 20 *Geo. Int'l Envtl. L. Rev.,* 573 (2008); Docherty, B. & Giannini, T. "Confronting a Rising Tide: A Proposal for a Convention on Climate Change Refugees," 33 *Harv. Envtl. L. Rev.,* 349 (2009); Dodds, F., et al. (eds.), *Climate Change and Energy Insecurity: The Challenge for Peace, Security and Devleopment*, Earthscan, 2009; El-Ashry, M. "An Overview of This Issue: Framework for a Post-Kyoto Climate Change Agreement," 8(2) *Sustainable Dev. L. & Pol'y,* 2 (2008); Gainza-Carmenates, R., et al., "Stakeholder-based Scenarios for Post-2012 Climate Policy: A Participatory Approach," 3 *Carbon & Climate L. Rev.,* 248 (2009); Green, B. "Lessons From The Montreal Protocol: Guidance For The Next International Climate Change Agreement," 39 *Envtl. L.,* 253 (2009); Halvorssen, A. "UNFCCC, The Kyoto Protocol, and The WTO -- Brewing Conflicts Or Are They Mutually Supportive?" 36 *Denv. J. Int'l L. & Pol'y,* 369 (2008); Heller, T. "Afterword: Reflections on a Path to Effective Climate Change Mitigation" in Stewart, R. et al. (eds.), *Climate Finance: Regulatory and Funding Strategies for Climate Change and Global Development,* NYU Press, 2009; Hill, R. "The International Climate Change Agreement: An Evolution," 24 *U. New South Wales L.J.,* 543 (2001); Höhne, N. *et al*., "Climate Change Legislation And Initiatives At International Level And Design Options For Future International Climate Policy," *Policy Department Economic and Scientific Policy* (2007); Jamieson, D. "The Post-Kyoto Climate: A Gloomy Forecast," 20 *Geo. Int'l Envtl. L. Rev.,* 537 (2008); Kaniaru, D. et al., "Landmark Agreement to Strengthen Montreal Protocol Provides Powerful Climate Mitigation," 8(2) *Sustainable Dev. L. & Pol'y,* 46 (2008); Long, A. "International Consensus and U.S. Climate Change Litigation," 33 *Wm. & Mary Envtl. L. & Pol'y Rev.,* 177 (2008); Malone, E. *Debating Climate Change: Pathways through Argument to Agreement,* Earthscan, 2009; McNeely, J. "Applying the Diversity of International Conventions to Address the Challenges of Climate Change," 17 *Mich. St. J. Int'l L.,* 123 (2008); Morgenstern, L. "One, Two or One and a Half Protocols? An Assessment of Suggested Options for the Legal Form of the Post-2012 Climate Regime," 3 *Carbon & Climate L. Rev.,* 235 (2009); Mumma, A. & Hodas, D. "Designing a Global Post-

2.1. Earth Summit: Rio de Janeiro and the UNFCCC (1992)

Twenty years after the 1972 Stockholm Declaration first laid the foundations of contemporary environmental policy, the Earth Summit became the largest-ever gathering of Heads of State. One of the documents resulting from the Earth Summit was the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC is the centerpiece of global efforts to combat global warming and sets general objectives, goals, and arrangements for cooperation in addressing climate change. As concern about climate change has grown, the UNFCCC has provided a forum for negotiating a more intensive and detailed international agreement for, *inter alia*, the limitation of GHG emissions. Over 150 countries signed the UNFCCC in 1992. Because of the refusal of the U.S. to accept a target, the final text of the UNFCCC did not specify precise targets for any

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Kyoto Climate Change Protocol that Advances Human Development," 20 *Geo. Int'l Envtl. L. Rev.,* 619 (2008); Petsonk, A. "'Docking Stations:' Designing a More Welcoming Architecture for a Post 2012 Framework to Combat Climate Change," 19 *Duke J. Comp. & Int'l L.,* 433 (2009); Rajamani, L. "Addressing the 'Post-Kyoto' Stress Disorder: Reflections on the Emerging Legal Architecture of the Climate Regime," 58 *Int'l & Comp. L.Q.,* 803 (2009); Rajamani, L. "From Berlin to Bali and Beyond: Killing Kyoto Softly?" 57 *Int'l & Comp. L.Q.,* 909 (2008); Rehak, S. "Climate Change and the Copenhagen Consensus 2004: A Critical Review of Economic Prioritization," 2005 *Colo. J. Int'l Envtl. L. & Pol'y,* 41; Roberts, M. "The Montreal Protocol Must Act to Prevent Global Climate Change While Restoring the Ozone Layer," 9(3) *Sustainable Dev. L. & Pol'y,* 33 (2009); Roberts, M. & Grabiel, P. "A Window of Opportunity: Combating Climate Change by Amending the Montreal Protocol to Regulate the Production and Consumption of HFCs and ODS Banks," 22 *Geo. Int'l Envtl. L. Rev.,* 99 (2009); Schatz, A. "Foreword: Beyond Kyoto - The Developing World and Climate Change," 20 *Geo. Int'l Envtl. L. Rev.,* 531 (2008); Schwarze, R. *Law and Economics of International Climate Change Policy*, Dordrecht 2001; Smyth, S. "The Prototype Carbon Fund: A New Departure in International Trusts and Securities Law," 5(2) *Sustainable Development L. & Pol'y,* 28 (2005); Sussman, E. "The Energy Charter Treaty's Investor Protection Provisions: Potential to Foster Solutions to Global Warming and Promote Sustainable Development, 14 *ILSA J. Int'l & Comp. L.*, 391 (2008); Winter, G. *Multilevel Governance of Global Environmental Change: An Interdisciplinary Approach*, Cambridge University Press 2006; Zedillo P. *Global Warming: Looking Beyond Kyoto,* Brookings Institution Press 2008.

country.[5] Industrialized nations agreed to voluntary caps on emissions of man-made GHG. It entered into force on 21 March 1994.[6]

Although the U.S. and most other industrialized countries failed to meet their voluntary goals (i.e., returning emissions to 1990 levels by year 2000, as embodied in Article 4 of the UNFCCC), and notwithstanding the fact that no U.S. administration has done much to implement the UNFCCC's provisions, the Convention provides not only a long-term view, but also much of the mechanics such as emissions monitoring and reporting, that will be needed to implement any future obligations. Most importantly, the Convention provides for an ongoing process of negotiation, review of new scientific information, and discussion and collaboration by countries on the climate change issue.

The Convention's ultimate objective is the

> "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic (man-made) interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner."[7]

The chart below shows the exponential rise in CO2 atmospheric concentration in the past few decades.[8]

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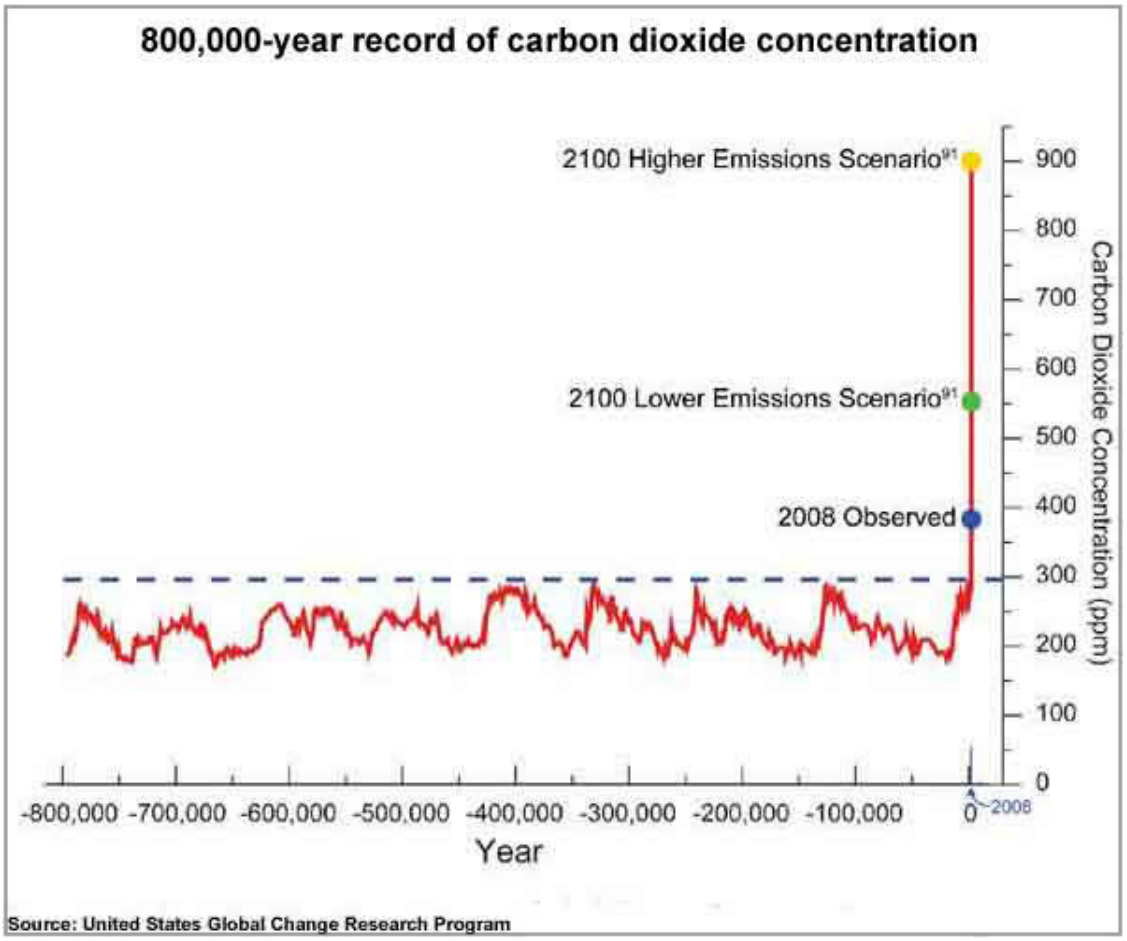
[5] Bodansky, D. "The United Nations Framework Convention on Climate Change: A Commentary," *Yale Journal of International Law*, 18: 451-558, 1993.

[6] According to Article 24 of the 1969 Vienna Convention on the Law of Treaties, a treaty enters into force for those states which gave the required consent. A treaty may also provide that, upon certain conditions having been met, it shall come into force provisionally.

[7] Article 2 of the UNFCCC (1992). For an analysis of Article 2 of the UNFCCC, see Oppenheimer, M. & Petsonk, A. "Article 2 of the UNFCCC: Historical Origins, Recent Interpretations," *Climatic Change*, Vol. 73, pp. 195-226, 2005.

[8] On the reasons for concern regarding climate change, see the analysis by Joel Smith *et al*. "Assessing dangerous climate change through an update of the Intergovernmental Panel on Climate Change (IPCC) 'reasons for concern'," PNAS, Vol. 106, No. 11, 17 March 2009, pp. 4133-4137; see also O'Neill, B. & Oppenheimer, M. "Dangerous Climate Impacts and the Kyoto Protocol," *Science*, Vol. 296, pp. 1971-1972, June 2002.



The major guidelines of the Convention are as follows:

a.- *The Convention sets out some guiding principles.* The Convention speaks of "precautionary measures,"[9] meaning that the lack of full scientific certainty should not be used as an excuse to postpone action when there is a threat of serious or irreversible damage. The principle of "common but differentiated responsibilities"[10] of states assigns the lead in combating climate change to developed countries. Other principles deal with

[9] Article 3.3 of the UNFCCC (1992).
[10] Articles 3.1 and 4.1 of the UNFCCC (1992).

the special needs of developing countries and the importance of promoting sustainable development.[11]

b.- *Both developed and developing countries accept a number of general commitments.*[12] All Parties will develop and submit "national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol,[13] using comparable methodologies to be agreed upon by the Conference of the Parties."[14] According to Article 4.1(c) and (d) of the UNFCCC, the Parties will also promote technology transfer[15] and sustainable management, conservation and enhancement of sinks[16] and reservoirs.[17] In addition, the Parties shall "take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions"[18] as well as "cooperate in scientific, technological, technical, socio-economic and other research […] related to the climate system."[19] They will also promote and cooperate in education, public awareness, and exchange of information related to climate change.[20]

[11] On this point, see generally the report by the United Nations Environment Program, "Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication," 2011.
[12] Article 4.1 of the UNFCCC (1992) contains general commitments for all Parties, developing and developed.
[13] (*footnote not in the original quotation*) The 1987 Montreal Protocol on Substances that Deplete the Ozone Layer came was created as a result of the recognition that "world-wide emissions of certain substances can significantly deplete and otherwise modify the ozone layer in a manner that is likely to result in adverse effects on human health and the environment." See the Preamble of the Montreal Protocol.
[14] Article 4.1(a) of the UNFCCC (1992).
[15] Article 4.1(c) of the UNFCCC (1992).
[16] Article 1.8 of the UNFCCC defines sinks as "any process, activity or mechanism which removes a greenhouse gas, an aerosol or a precursor of a greenhouse gas from the atmosphere."
[17] Article 1.7 (d) of the UNFCCC defines reservoir as "a component or components of the climate system where a greenhouse gas or a precursor of a greenhouse gas is stored."
[18] Article 4.1(f) of the UNFCCC (1992).
[19] Article 4.1(g) of the UNFCCC (1992).
[20] Article 4.1(i) of the UNFCCC (1992).

c.- *Industrialized countries also undertake several specific commitments.*[21] Most members of the Organization for Economic Cooperation and Development (OECD)[22] and the States of Central and Eastern Europe—known collectively as Annex I countries, i.e., those countries listed in Annex I of the UNFCCC—committed to adopting policies and measures aimed at returning their GHG emissions to 1990 levels by the year 2000. Countries must decide what policies and measures to adopt in order to achieve their emissions targets.[23] Some possible policies and measures which Parties could implement are listed in the Kyoto Protocol and could offer opportunities for intergovernmental cooperation.[24] OECD countries should take the strongest measures, while the countries in transition to a market economy are granted a certain degree of flexibility.

d.- *The richest countries shall provide new additional financial resources and facilitate technology transfer.* The Annex II countries of the UNFCCC (essentially OECD countries) will fund the agreed full cost incurred by developing countries for submitting their national communications. The Convention recognizes that the extent to which developing countries implement their commitments will depend on financial and technical assistance from developed countries.

[21] Article 4.2 of the UNFCCC (1992) contains specific commitments for developed country (Annex I) Parties only, notably to take measures aimed at returning greenhouse gas emissions to 1990 levels by the year 2000.

[22] The OECD groups 30 member countries sharing a commitment to democratic government and market economy in a unique forum to discuss, develop, and refine economic and social policies. They compare experiences, seek answers to common problems, and work to co-ordinate domestic and international policies to help members and non-members deal with an increasingly globalized world. Their exchanges may lead to agreements to act in a formal way, for example by establishing legally binding agreements to crack down on bribery, or codes for free flow of capital and services. Together, they produce around two-thirds of the world's goods and services.

[23] See Article 4.2 (b) of the UNFCCC (1992), which reads: "In order to promote progress to this end, each of these Parties shall communicate […] detailed information on its policies and measures" on the mitigation of climate change.

[24] Article 2.1(a) of the Kyoto Protocol.

e.- *The establishment of institutional structures and a system of establishing and amending Protocols and Annexes are an important element of the Convention.* This is perhaps the most important part of the Convention. There will be a system of periodic Conferences of the Parties so that as more becomes known about climate change, additional commitments can be made through a structural disciplined iterative process. That is why it is a "Framework" Convention.

2.2. COP-1: Berlin (1995)

As is the case in many international treaties, the UNFCCC started a process that included annual meetings called Conferences of the Parties (COPs). The first of these was held in Berlin in 1995, where the parties agreed that the industrialized parties should set emission limits within specified time-frames such as 2005, 2010, 2020, and that these should be incorporated in a protocol, to be signed possibly by the end of 1997. This is where the idea of the Kyoto Protocol was given birth. So the COP-1 produced the Berlin Mandate, which provided the ground rules for the negotiation of the Kyoto Protocol.

2.3. COP-2: Geneva (1996)

For the first time, it was officially announced that there is a human influence on the global climate. Before the 1996 COP-2 in Geneva, there was some controversy as to whether climate change resulted from human activity.

2.4. COP-3: Kyoto and the Kyoto Protocol (1997)

At the December 1997 COP-3, the 159 participating nations adopted by consensus the Kyoto Protocol,[25] which was a step further from previous international environmental agreements on climate change because it contained stronger emissions commitments for developed countries in the post-2000 period.[26] The Kyoto Protocol was stronger in two senses: 1) being legally binding, which was necessary, and 2) being more ambitious in aiming for real reduction from 1990 emissions levels, as opposed to merely reaching the 1990 levels.

Regarding the second point, by adopting the Protocol, the parties recognized the importance of expanding the scope of the UNFCCC. The Parties also recognized that more ambitious steps than the UNFCCC commitments to stabilize GHG emissions were required to address climate change. This point may be the conventional way to look at the Protocol but, by doing that, it does an injustice to the UNFCCC, which after all was established as a Framework to initiate a process that was expected to lend to Kyoto-type environmental agreements. From that perspective, Kyoto may have been a disappointingly unambitious step. By arresting and reversing the upward trend in GHG emissions that started 150 years ago, the Protocol promised to move the international community one step closer to achieving the UNFCCC's ultimate objective of preventing "dangerous anthropogenic interference with the climate system."[27]

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[25] Adoption is the formal act by which the form and content of a proposed treaty text are established. As a general rule, the adoption of the text of a treaty takes place through the expression of the consent of the States participating in the treaty-making process. See Article 9 of the 1969 Vienna Convention on the Law of Treaties.

[26] Bothe, M. "The Kyoto Protocol as a Pioneer Among the Multilateral Environmental Agreements," in Douma, W., Massai, L. & Montini, M. (eds.) *The Kyoto Protocol and Beyond: Legal and Policy Challenges of Climate Change*, The Hague: TMC Asser Press, 2007, pp. 241-246.

[27] Article 2 of the UN Framework Convention on Climate Change.

Kyoto marked the first international environmental negotiation to receive widespread attention since the 1992 Earth Summit in Rio de Janeiro. The diverging positions of the key parties to the negotiation—the European Union, the United States, and the G-77[28]—seemed too distant for any meaningful agreement to be reached. Almost the entire text of the Kyoto Protocol was heavily bracketed, often with more than two alternative provisions elaborated. Failure to reach an agreement would be deemed an embarrassing failure to many governments. Obviously, no one wanted to be accused of having killed Kyoto. The then U.S. Vice President Al Gore agreed to attend the conference and publicly instructed the U.S. delegation to be flexible during the negotiation in order to reach an agreement. Within a few days, the United States announced that it would consider flexible targets and timetables. This meant that industrialized nations did not have to agree to the same emission reductions and the same baseline year.[29]

Based on these grounds, Japan immediately tabled a new proposal which had the EU reducing emissions more than either the U.S. or Japan. The EU reacted to the Japanese proposal by insisting on being able to use the EU Kyoto "bubble"[30] by which it could meet the emission reductions through a system of trading among its Member States, in accordance with Article 4 of the Kyoto Protocol. The U.S.—which disagreed

[28] "The Group of 77 is the largest intergovernmental organization of developing states in the United Nations, which provides the means for the countries of the South to articulate and promote their collective economic interests and enhance their joint negotiating capacity on all major international economic issues within the United Nations system, and promote South-South cooperation for development." See The Group of 77 at the United Nations, http://www.g77.org/doc/.

[29] See Hunter, D., Salzman, J. & Zaelke, D. *International Environmental Law and Policy*, Foundation Press, 1998, pp. 649-50.

[30] The Kyoto Protocol has changed the context of global warming policies by prescribing legally binding GHG emissions reduction targets to countries listed in its Annex B. The EU has a commitment to reduce its overall emissions by 8 per cent, but Article 4 of the Kyoto Protocol (usually referred as the "EU bubble")

with the "bubble" concept because it enabled EU nations to act as a bloc in emission reduction to meet their targets—said that it was considering creating a GHG trading regime including Japan, Canada, Australia, New Zealand, and the U.S. (the so-called JUSCANZ countries).[31]

The Kyoto Protocol was criticized (even before it was completed) for its exclusion of mandatory GHG emissions limitation requirements for developing countries, even those with large GHG emission inventories like China, India, and Brazil. From a U.S. perspective, the structure of the negotiation problem looks remarkably similar today to how it looked during the COP-3.

2.5. COP-6: The Hague (2000)

The conference at The Hague broke down because the draft treaty tried to do too much too fast. There were too many brackets to be worked on when politicians came to The Hague. In the end, there was not enough time to resolve the issues contained in the brackets and texts which remained on the table.[32]

Four main issues were negotiated at The Hague. The first one concerned the transfer of clean technologies to developing countries and the provision of aid to help developing countries adapt to climate change and develop the capacity to track their own emissions. Developing countries wanted to know how much money would be provided and how it would be allocated.

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allows the EU and its Member States to fulfill their commitments jointly, through differentiated commitments for Member States.

[31] Hunter, D., Salzman, J. & Zaelke, D. *International Environmental Law and Policy*, Foundation Press, 1998, p. 650.

[32] Grubb, M. & Yamin, F. "Climatic Collapse at The Hague: What Happened, Why, and Where do We Go from Here? *International Affairs*, Vol. 77, No. 2, 2001, pp. 261-276.

The second main issue was regarding sinks. During the negotiations, there was hope for agreement until, at the last moment, a compromise on "sinks" fell apart. The primary question was how much credit a country should get for its land use and forestry practices. The U.S. argued that it would need rules giving it wide access to credits for its sinks in order to meet the large reductions from business-as-usual emissions trends that Kyoto would impose. On the other hand, the Europeans denounced the American proposal as a major loophole that would undercut the integrity of the whole Kyoto regime.[33]

The third main issue at The Hague was the so-called Kyoto mechanisms (clean development mechanism, the trading of emissions permits, and joint implementation), all of which will be analyzed later. Although a number of fundamental policy questions remained unanswered, some progress was made in developing the technical procedures for these mechanisms.

The fourth main point had to do with compliance (how to measure and how to enforce the Kyoto Protocol), which will also be analyzed later. The Hague unfortunately gave no clear answers. Since the Kyoto text makes no provision for enforcement, this still remains one of the major legal deficiencies of the text.[34]

[33] Anderson, J.W., "Climate Change Diplomacy: The Next Step," in *Resources*, Winter 2001, Issue Number 142, pp. 11-13, at 12.
[34] Ibid., pp. 11-13, at 12-13.

2.6. COP-13: Bali (2007)

The Bali Conference legally obliged all parties to work for a new global climate change treaty. The outcome of the Bali Conference was the adoption of the Bali Action Plan,[35] which is a two-track process in which negotiators meet in two *ad hoc* working groups. The first one is the *Ad Hoc* Working Group on Long-Term Cooperative Action under the Convention (AWG-LCA), with a mandate to focus on key elements of long-term cooperation identified during the Convention Dialogue: mitigation, adaptation, climate finance (i.e., transfers of public and private funds from developed to developing countries for the mitigation of, and adaptation to, climate change),[36] capacity building, and technology transfer.[37] This group includes all parties to the UNFCCC. The second is the *Ad Hoc* Working Group for Further Commitments for Annex 1 Countries under the Kyoto Protocol (AWG-KP), and includes only those parties that have ratified the Kyoto Protocol.[38]

Maintaining this division was crucial for developing countries, because under the Kyoto Protocol developed countries (Annex 1) are legally bound to reduce emissions,

[35] http://unfccc.int/files/meetings/cop_ 13/application/pdf/cp_bali_action.pdf.
[36] On climate finance, see Stewart, R., Kingsbury, B. and Rudyk, B. "Climate Finance: Key Concepts and Ways Forward," *Harvard Project on International Climate Agreements*, Viewpoints, December 2009, available at http://www.iilj.org/climatefinance/documents/CF-KeyConcepts.pdf; Ballesteros, A., Nakhooda, S., Werksman, J. and Hurlburt, K, "Power, responsibility and accountability: re-thinking the legitimacy of institutions for climate finance" Washington, D.C.: World Resources Institute, 2010, available at http://pdf.wri.org/power_responsibility_accountability.pdf.
[37] See generally Rajamani, L. "From Berlin to Bali and Beyond: Killing Kyoto Softly?" *International and Comparative Law Quarterly*, vol. 57, pp. 909-939, October 2008 (tracing the evolution of the climate regime and analyzing the language of the Bali Action Plan in support of the argument that the Bali Action Plan provides Parties the option of killing Kyoto softly).
[38] On the Bali Action Pan, see generally Christoff, P. "The Bali Roadmap: Climate Change, COP 13 and Beyond," 17(3) *Environmental Politics*, pp. 466-472, 2008; Clemencon, R. "The Bali Road Map: A First Step on the Difficult Journey to a Post-Kyoto Protocol Agreement," 17 *The Journal of Environment & Development*, pp. 70-94, 2008; Mace, M.J. "The Bali Road Map: Can it Deliver an Equitable Post-2012 Climate Agreement for Small Island States?," 17(2) *Rev. Eur. Comm. & Int'l Envtl. L*. 183 (2008); Ott, H. *et al*., "The Bali Roadmap: new horizons for global climate policy," 8 *Climate Policy*, pp. 91-95 (2008);

whereas developing countries' reductions are voluntary. However, some developed countries, especially the U.S., found this approach unacceptable. In their view, a new climate change treaty should be a single treaty committing both developed and developing countries to reducing emissions, accepting the fact that developed countries must lead in the reductions, but also that some developing countries such as China, India, Brazil, and South Africa are today among the largest emitters of CO2 and therefore should not have the same level of obligations as the world's poorest countries.[39]

2.7. COP-15: Copenhagen and the Copenhagen Accord (2009)

Climate change is the result of the largest market failure the world has ever seen: the prices of goods and services do not reflect the true costs associated with the impacts of GHG emissions that would result from climate change. Future effective policies must address market failures by creating a price on emissions (in other words, a carbon price), which can be created through a carbon tax[40] or through a cap-and-trade system.[41] The

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Carpenter, C. "The Bali Action Plan: Key Issues in the Climate Negotiations," in United Nations Development Program, *The Bali Road Map: Key Issues under Negotiation*, pp. 5-21 (2008).

[39] Meilstrup, P. "The Runaway Summit: The Background Story of the Danish Presidency of COP15, the UN Climate Change Conference," *Danish Foreign Policy* Yearbook, 2010, pp. 113-135, at 122, available at http://www.diis.dk/graphics/Publications/Books2010/YB2010/YB2010-Runaway-summit_WEB.pdf.

[40] Cooper, R. "Toward a Real Treaty on Global Warming," *Foreign Affairs* 77: 66-79, 1998; Cooper, R. "The Kyoto Protocol: A Flowed Concept," *Environmental Law Reporter* 31: 11,484-11,492, 2001; Nordhaus, W. "After Kyoto: Alternative Mechanisms to Control Global Warming," paper prepared for a joint session of the American Economic Association and Association of Environmental and Resource Economists, 2001; Nordhaus, W. "Is the Kyoto Protocol a Dead Duck? Are There Any Live Ducks Around? Comparison of Alternative Global Tradable Emissions Regimes," revised from the NBER/Yale Workshop version of August 1997, 1998.

[41] "Under cap and trade schemes, governments or intergovernmental bodies set an overall legal limit on emissions in a certain time period ("a cap") and then grant industries a certain number of licenses to pollute ("carbon permits" or "emissions allowances"). Companies that do not meet their cap can buy permits from others that have a surplus ("a trade"). The cap is supposed to reduce emissions over time. However, setting a limit on pollution can be highly susceptible to corporate lobbying and favoritism, to such an extent that companies can frequently continue to increase pollution while remaining within the cap." See Carbon Trade Watch, December 2009, available at http://www.carbontradewatch.org/downloads/publications/factsheet01-cap_and_trade.pdf.

COP-15 clearly failed in at least on respect: it ended with the hastily negotiated Copenhagen Accord[42] which was unable to gain the support of the COP and thus amounted only to a series of political commitments by States, rather than the sought-after binding obligations. In particular, it failed to produce legally binding commitments by major emitting nations to additional or new emissions limitations. It is widely understood that one of the key reasons why the COP-15 failed to produce legally binding obligations was the inability of the U.S. to commit in an international agreement to a target for limiting emissions because of the U.S. administration's failure to secure passage of climate regulatory legislation. In other words, the current machinery is insufficient for the needs of resolving the climate change issue.

The international community, however, agreed in the Copenhagen Accord that

> "[T]o achieve the ultimate objective of the Convention [on Climate Change] to stabilize greenhouse gas concentration in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system, we shall, recognizing the scientific view that the increase in global temperature should be below 2 degrees Celsius, on the basis of equity and in the context of sustainable development, enhance our long-term cooperative action to combat climate change."[43]

Moreover, the Accord did make progress on some important issues and set the agenda for further negotiations throughout 2010. The Copenhagen Accord, put forward by Brazil, China, India, South Africa, and the U.S., provided a platform for building a necessary international climate change agreement. More than 100 countries have associated themselves with the Accord. Countries that have made pledges of action are

[42] Copenhagen Accord, FCCC/CP/2009/L.7, 18 December 2009.
[43] Ibid., para. 1.

responsible for more than 80 per cent of current annual emissions of GHG.[44] The Accord's key features are as follows:

- Under the Copenhagen Accord, nations pledged not only to finance mitigation and adaptation efforts for developing countries, but also to keep global temperatures from rising more than 2 degrees Celsius (3.6 degrees Fahrenheit)[45] from pre-industrial levels;[46]
- The Accord recognizes that developing countries will require significant support from developed nations to help them with the transition to low-carbon growth. In this sense, the Accord committed developed countries to "a goal of mobilizing jointly US$100 billion a year by 2020."[47] However, recognizing that developed countries would find it difficult to provide additional money from current public funds, a high-level advisory group on climate change financing established by the UN Secretary-General looked at various sources of climate financing in developing countries, such as taxes on, or trading schemes for, international aviation and shipping, raising public funds via the international and domestic auctions of emission allowances, making use of the International Monetary Fund's special drawing rights, as well as stimulating private capital flows through scaled up market mechanisms, and innovative financial instruments

[44] For analyses of the Copenhagen Conference, see Doelle, M, "The Legacy of Climate Talks in Copenhagen: Hopenhagen or Brokenhagen?" 1 *Carbon & Climate L. Rev.*, 86 (2010); Ekardt, F. *et al*., "Climate Change, Justice, and Clean Development – A Review of the Copenhagen Negotiating Draft," 3 *Carbon & Climate L. Rev.,* 261 (2009); Hines, R. "Looking To The UN Climate Change Convention In Copenhagen: Upcoming Developments In The Climate Change Policy Arena," and Saines, R. "Changing Developments in Climate Change Law: Looking Ahead To Copenhagen And Beyond," in *The Impact of International Climate Change Policies: Leading Lawyers On Counseling Clients, Navigating Recent and Upcoming Developments, and Recognizing The Economic Impact of Climate Change Policy*, Aspatore Books, 2009.

[45] Copenhagen Accord, FCCC/CP/2009/L.7, para. 2.

[46] For an analysis of what happened at the COP-15, see Meilstrup, P. "The Runaway Summit: The Background Story of the Danish Presidency of COP15, the UN Climate Change Conference," *Danish Foreign Policy* Yearbook, 2010, pp. 113-135, available at http://www.diis.dk/graphics/Publications/Books2010/YB2010/YB2010-Runaway-summit_WEB.pdf.

[47] Copenhagen Accord, FCCC/CP/2009/L.7, para. 8.

that seek to improve the risk-return ratio associated with green investment in developing countries.[48] One example of the latter is Deutsche Bank's proposed GET FiT program,[49] which would use a fund of public monies contributed by developed countries to address project development and financing barriers and, thereby catalyze greater supply of (and demand for) private sector financing for renewable energy projects in low- and middle-income countries. In particular, the fund would support the development of domestic policies aimed at mitigating risk and creating incentives for investment for investing in renewable energy, such as the use of feed-in tariffs and power purchase agreements.

- The Accord called for both developed and developing countries to submit individual emissions-reduction goals or action plans. The Copenhagen Accord, however, failed to produce an adequate and legally binding action plan for achieving long-term reductions in GHG emissions for 2020 and 2050.[50] The absence of binding targets under the Kyoto Protocol for most of the world's largest emitters, including China (which has surpassed the U.S as the largest emitter of CO2 in the world), the U.S., Indonesia, India, and Brazil, has undermined both the environmental effectiveness and broader legitimacy of the Kyoto Protocol regime;

[48] Report of the Secretary-General's High-Level Advisory Group on Climate Change Financing, 5 November 2010, available at http://www.un.org/wcm/webdav/site/climatechange/shared/Documents/AGF_reports/AGF%20Report.pdf.
[49] Deutsche Bank Group, "GET FiT Program: Global Energy Transfer Feed-in Tariffs for Developing Countries," April 2010, available at http://www.dbadvisors.com/content/_media/GET_FIT_-_042610_FINAL.pdf.
[50] For an assessment of the Copenhagen Accord, see Houser, T. "Copenhagen, the Accord, and the Way Forward," Policy Brief, No. 10-5, Peterson Institute for International Economics, March 2010.

- The Accord provides for a system of pledge and review, whereby developed countries would set their own, non-binding targets for reducing GHG emissions and would communicate these to the UNFCCC Secretariat;[51]

- The Accord provides for developing countries to formulate programs of Nationally Appropriate Mitigation Actions (NAMAs)[52] (that is, projects and policies formulated domestically with the aim of reducing greenhouse gas emissions) also to be communicated to the UNFCCC secretariat.[53]

- The Accord commits developed countries to provide US$30 billion in fast-start climate finance to developing countries over the period 2010 to 2012. Priority in the funding was pledged to Africa, least-developed countries, and small island nations;[54] Climate finance, therefore, emerged as a key pillar of the climate change negotiations.[55]

- The Accord requires the measurement, reporting, and verification (MRV)[56] of both emissions reductions achieved and climate finance provided by developed to developing countries;[57]

- The Accord recognizes the crucial role of reducing emissions from deforestation and forest degradation in developing countries, and the need to provide positive

[51] Copenhagen Accord, FCCC/CP/2009/L.7, para. 4.
[52] For a list of the specific commitments made, see Dalkmann, H. & Binsted, A. "Copenhagen Accord NAMA Submissions," February 2010, available at http://www.transport2012.org/bridging/ressources/files/1/586,NAMA-submissions_080210_final.pdf.
[53] Copenhagen Accord, FCCC/CP/2009/L.7, para. 5.
[54] Copenhagen Accord, FCCC/CP/2009/L.7, para. 8.
[55] On the link between international law and climate finance, see Mason-Case, S. & Cordonier Segger, M.-C., "International Law and Climate Finance," The Center for International Sustainable Development Law & The International Development Law Organization, December 2010.
[56] For further detail on the MRV, see Pew Center on Global Climate Change, "MRV: A Survey of Reporting and Review in Multilateral Regimes," December 2010, available at http://www.pewclimate.org/docUploads/survey-reporting-review-multilateral-regimes.pdf; also, Pew Center on Global Climate Change, "Strengthening MRV: Measurement, Reporting and Verification," December 2010, available at http://www.pewclimate.org/docUploads/strengthening-mrv.pdf.
[57] Copenhagen Accord, FCCC/CP/2009/L.7, para. 5.

incentives through the establishment of carbon trading[58] and other financing mechanisms, including Reducing Emissions from Deforestation and Forest Degradation-plus, to mobilize financial resources from developed countries.[59]

In the end, the negotiations boiled down to two main groups with clear positions. The first group was composed of developing countries (represented by China, India, Brazil, and South Africa), arguing that developed countries are responsible for most of the global damage resulting from climate change. The second group, comprised developed countries (represented by three main EU countries—i.e., Germany, France, and the UK, the position of all of whom was concrete figures on CO2 reduction—and the U.S.), demanded developing countries to commit to greater GHG reduction if they wanted citizens from developed countries to make the necessary economic sacrifice to tackle climate change.[60] In this sense, China accepted the need to grow with less carbon intensity and is investing in energy efficiency and existing low-carbon technology. The United States committed to reducing its emissions by 17 per cent by 2020. The U.S. federal government will have great difficulty achieving that target without action at the state level, particularly so long as Congress is unwilling to pass a comprehensive climate

[58] See for instance Howse, R. & Eliason, A. "Carbon Trading and the CDM in WTO Law," in Stewart, R., Kingsbury, B. and Rudyk, B. (eds.), *Climate Finance: Regulatory and Funding Strategies for Climate Change and Global Development*, NYU Press, 2009, pp. 254-258; Freestone, D. and Streck, C. (eds.), *Legal Aspects of Carbon Trading: Kyoto, Copenhagen, and Beyond*, Oxford: Oxford University Press, 2009.
[59] Copenhagen Accord, FCCC/CP/2009/L.7, para. 6.
[60] To listen to the actual climate negotiations among the main world leaders in Copenhagen in December 2009, see Spiegel Online, "How China and India Sabotaged the UN Climate Summit," available at http://www.spiegel.de/international/world/0,1518,692861-2,00.html.

and energy bill. It is interesting to note that embassy dispatches show that the U.S. used spying, threats, and promises of aid to get support for the Copenhagen Accord.[61]

2.8. COP-16: Cancún (2010)

2.8.1. An Overview

The Cancún Conference of the Parties surpassed the low expectations when governments struck a deal that keeps alive efforts for a multilateral response to tackle climate change.[62] Governments agreed on an international system for monitoring mitigation, fleshed out a facility for climate finance,[63] and established rules for rewarding forest preservation. However, trade issues (such as emissions resulting from the international shipment of goods, the use of unilateral trade measures ostensibly to offset reduced industrial competitiveness resulting from higher carbon costs), proved too contentious, and were left out of the text. Additionally, any references to the use of unilateral trade measures were removed, leaving a crucial element of enforcement and regulation unresolved.

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[61] Carrington, D. "WikiLeaks Cables Reveal how US Manipulated Climate Accord," *The Guardian*, 4 December 2010, p. 6, available at http://www.guardian.co.uk/environment/2010/dec/03/wikileaks-us-manipulated-climate-accord.

[62] See generally http://unfccc.int/2860.php; for specific deals agreed in Cancún, see UNFCCC, *Outcome of the Work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention*, Draft Decision -/CP.16 (2010), available at http://unfccc.int/files/meetings/cop_16/application/pdf/cop16_lca.pdf; also, UNFCCC, *Outcome of the Work of the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol at its Fifteenth Session*, Draft Decision -/CMP.6 (2010), available at http://unfccc.int/files/meetings/cop_16/application/ pdf/cop16_kp.pdf.

[63] See http://unfccc.int/files/meetings/cop_16/conference_documents/application/pdf/20101204_cop16_fm.pdf. See also Pew Center on Global Climate Change, "Strengthening International Climate Finance," December 2010, available at http://www.pewclimate.org/docUploads/strengthening-international-climate-finance.pdf. On climate finance, Daniel Firger argues that, contrary to conventional wisdom, while some climate-friendly regulations may indeed be *prima facie* incompatible with the obligations imposed on states by typical international investment agreements, many climate policies—especially those related to climate finance and technology transfer—involve principles common to foreign investment law and are largely

Moreover, governments' positions were diametrically opposed on future obligations to reduce greenhouse gas emissions.[64]

One outcome of the Cancún decisions was the formalization of the "pledge and review" regime for developed-country mitigation and the NAMAs concept for developing-country mitigation. China and India made clear that they would not endorse any agreement that did not commit developed countries to take on further emission reduction obligations under the Kyoto Protocol. The U.S.—which is not a party to the Kyoto Protocol—wanted to replace Kyoto with a new agreement that would include binding commitments for all countries.

Another outcome of Cancún was the fact that the Green Climate Fund—which was established at the COP-15 in Copenhagen[65] to help address the questions of how to finance low-carbon development strategies in developing countries, since this is one of the most important issues of climate negotiations—was strengthened and designated as an operating entity of the financial mechanism of the UNFCCC under its Article 11, with arrangements to be concluded between the COP and the Green Climate Fund to ensure that it is "accountable to and functions under the guidance of" the COP.[66] Moreover, the Green Climate Fund will have a governing board of 24 members, comprising an equal number of members from developed and developing country parties.[67] Representatives

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compatible with that regime. See Firger, D. "Harmonizing Climate Change and International Investment Law: Threats, Challenges and Opportunities," 2011.

[64] For an analysis of COP-16, see Morgan, J. *et al*., "Reflections on the Cancún Agreements," World Resources Institute, December 2010, available at http://pdf.wri.org/reflections_on_cancun_agreements.pdf.

[65] Copenhagen Accord, FCCC/CP/2009/L.7, 18 December 2009, para. 10.

[66] See http://unfccc.int/files/meetings/cop_16/application/pdf/cop16_lca.pdf, para. 102.

[67] See Bird, N., Brown, J. and Schalatek, L. "Design Challenges for the Green Climate Fund," Heinrich Böll Stiftung/Overseas Development Institute, Climate Finance Policy Brief No. 4, January 2011; Ghosh, A. "Negotiating Around Tradeoffs: Alternative Institutional Designs for Climate Finance," ECP Report No. 10, December 2010.

from developing country parties should include representatives from the relevant UN regional groupings, as well as representatives from the relevant small island developing states and least developed countries.[68] Furthermore, the World Bank was given a three-year interim mandate to serve as trustee, subject to review.[69]

The Fund would be designed by a Transitional Committee[70] made up of a majority of developing countries[71] and will have an independent secretariat.[72] The types of issues that the Transitional Committee has been asked to look at include *inter alia*: a) the legal and institutional arrangements for the establishment and operationalization of the Green Climate Fund; b) rules of procedure of the Board and other governance issues related to the Board; c) methods to manage large scale financial resources from a number of sources and to be delivered through a number of instruments; d) methods to enhance complementarity between the Green Climate Fund's activities and those of other bilateral, regional, and multilateral funding mechanisms and institutions; e) mechanisms to ensure financial accountability and to evaluate the performance of activities supported by the fund; f) mechanisms to ensure the application of environmental and social safeguards, as well as internationally accepted fiduciary standards and sound financial

[68] See http://unfccc.int/files/meetings/cop_16/application/pdf/cop16_lca.pdf, para. 103.
[69] Ibid., para. 107.
[70] See http://unfccc.int/cancun_agreements/green_climate_fund/items/5869.php.
[71] The 40-member committee will be made up of 15 developed countries and 25 developing countries (seven from Africa, seven from Asia, seven from the Group of Latin America and Caribbean Countries, two from small island developing states, and two least-developed countries). See http://unfccc.int/files/meetings/cop_16/application/pdf/cop16_lca.pdf, para. 109.
[72] Ibid., para. 108.

management to the fund activities; g) mechanisms to ensure stakeholder input and participation.[73]

Moreover, the pledges of Copenhagen to provide US$30 billion annually in fast-start finance between 2010 and 2012, and US$100 billion per annum by 2020,[74] which will flow from developed to developing countries, are important for two main reasons: 1) as a means of financing projects for mitigation of GHG emissions and adaptation to the adverse effects of climate change in developing countries; and 2) as part of the broader political bargain that needs to be reached between developed and developing countries regarding climate change.

Cancún also secures the survival of Kyoto's Clean Development Mechanism program and opens up the possibility for its expansion.[75] Another major outcome—particularly for China—can be seen in the establishment of an international system for providing measurement, reporting, and verification (MRV) for mitigation actions, a significant contrast to what transpired in Copenhagen the year before. This transparency issue had seemed too difficult to solve in the weeks leading up to Cancún, since the U.S. insisted that it be a part of any financing package, and China resolutely against anything of that nature. The Cancún decisions also made provisions for several new institutions,

[73] For a full list of issues the Green Climate Fund is expected to do, see Annex III of the COP-16 Decision, available at http://unfccc.int/files/meetings/cop_16/application/pdf/cop16_lca.pdf, p. 27.
[74] Copenhagen Accord, FCCC/CP/2009/L.7, 18 December 2009, para. 8.
[75] See http://unfccc.int/files/meetings/cop_16/conference_documents/application/pdf/20101204_cop16_cmp_guidance_cdm.pdf.

including a new Technology Mechanism,[76] a Registry for recording NAMAs and international support for NAMAs,[77] and a Standing Committee on Finance.[78]

Regarding the Standing Committee, it will assist the COP in exercising its functions with respect to the financial mechanism. In particular, the COP's decision refers to the Standing Committee improving "coherence and coordination"[79] in the delivery of climate change financing, rationalization of the financial mechanism, mobilization of financial resources, as well as measurement, reporting and verification of support provided to developing countries. There is no further guidance given to the nature of the Standing Committee's functions, nor how it is to achieve these broadly stated objectives. Instead, the COP's decision provides for the parties to "further define the roles and functions"[80] of the Standing Committee at some future time. The composition of the Committee, the manner in which its members will be appointed, and the nature of its interactions with the COP must also be resolved.

Moreover, as laid out in the Kyoto Protocol, developing countries will continue to not be penalized for failing to meet their emissions targets. In the end, China also managed to set its reduction target based on emissions intensity, which is a less arduous target based on carbon emissions per unit of economic output. Developed countries, on

[76] http://unfccc.int/files/meetings/cop_16/application/pdf/cop16_lca.pdf, para. 117.
[77] http://unfccc.int/files/meetings/cop_16/application/pdf/cop16_lca.pdf, para. 53.
[78] http://unfccc.int/files/meetings/cop_16/application/pdf/cop16_lca.pdf, para. 112. On the issue of how to make operational a COP Standing Committee on Finance to support the governance of the UNFCCC financial mechanism, see Müller, B. "Time to Roll Up the Sleeves – Even Higher!: Long-term Climate Finance After Cancún," *Oxford Energy and Environment Brief*, January 2011 (arguing that all relevant sectors ought to be actively involved in the design process of the new Green Climate Fund).
[79] Outcome of the work of the Ad Hoc Working Group on long-term Cooperative Action under the Convention, available at
http://unfccc.int/files/meetings/cop_16/application/pdf/cop16_lca.pdf, para. 112.
[80] Ibid.

the other hand, had been pushing for commitments capping total emissions. The 2-degrees-Celsius warming target, set in the Copenhagen Accord, was also confirmed in Cancún, although a provision was also made for the later review of this objective on the basis of best-available scientific knowledge.[81]

A further outcome of Cancún was the Cancún Adaptation Framework,[82] whereby parties are invited to enhance adaptation action, even internationally, through: planning and implementation of adaptation actions identified in national adaptation planning processes; impact, vulnerability, and adaptation assessments; strengthening institutional capacities and enabling environments; building resilience of socio-economic and ecological systems; enhancing disaster risk reduction strategies; technology development and transfer; and improving access to climate-related data.[83]

2.8.2. A Note on Climate Finance

The obligation for developed countries to provide "new and additional [financial] resources"[84] for these purposes originates in Articles 4.3 and 4.4 of the UNFCCC, although it really was not until the COP-15 in Copenhagen that the parties started to attach real importance to it as part of a broader deal on climate change. Thus, current

[81] See Outcome of the work of the Ad Hoc Working Group on long-term Cooperative Action under the Convention, para 4, available at http://unfccc.int/files/meetings/cop_16/application/pdf/cop16_lca.pdf.
[82] http://unfccc.int/files/meetings/cop_16/application/pdf/cop16_lca.pdf#page=3, paras. 11-35; see also Morgan, J. "Reflections on the Cancún Agreements," *World Res. Inst.*, Dec. 14, 2010, *available at* http://pdf.wri.org/reflections_on_Cancún_ agreements.pdf.
[83] Efforts to anchor text in an outcome document will continue as the international community works towards draft treaty language that can become a broadly-agreed-upon-ratified instrument. See Statement at the high-level segment by Christiana Figueres, Executive Secretary, UNFCCC, Sixteenth session of the Conference of the Parties and the sixth session of the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol, Cancún, 7 December 2010, available at http://unfccc.int/files/press/statements/application/pdf/101207_cop16_hls_cfig.pdf.
[84] http://unfccc.int/files/meetings/cop_16/application/pdf/cop16_lca.pdf, para. 95.

negotiations regarding climate finance within the UNFCCC refer to this relatively narrow North-South conception of climate finance. A broader conception of climate finance would include all cross-border financial flows to support mitigation and adaptation in developing countries. Thus, this definition would also include South-South flows, that is, the provision of financial support by one developing country to another. There are a number of examples of developing countries that are, in fact, donors for climate-related projects in other developing countries, despite the lack of obligation to provide such assistance, as is the case of China and the United Arab Emirates. The broadest conception of climate finance would also include domestic investment within developing countries. Cross-border flows represent only a fraction of the total amount that will ultimately be invested in meeting mitigation and adaptation objectives, with the bulk of funds actually being locally generated domestically through public and private channels.

Climate finance includes both public funds (that is, funds that originate from governments) and private funds (provided by firms and investors), where public funds are often used as a way of leveraging further financial flows from the private sector. International flows of climate finance currently move through three main channels: 1) public finance channeled through UNFCCC-controlled mechanisms—primarily the Global Environment Facility;[85] 2) public finance provided outside the UNFCCC framework, through multilateral and bilateral assistance programs as well as multilateral development banks; and 3) private funds flowing through regulated and voluntary carbon and other offset markets—including the Clean Development Mechanism established and governed under the UNFCCC, and other market arrangements outside the UNFCCC.

[85] For more information on the Global Environment Facility, see http://www.thegef.org/gef/whatisgef.

To date, the governance of climate finance has been a relatively *ad hoc* affair. Some funds are channeled through UNFCCC mechanisms such as the Global Environment Facility,[86] the Adaptation Fund,[87] and the Clean Development Mechanism,[88] over which the Conference of Parties has varying degrees of control. The greater proportion of funds flows outside the UNFCCC through a multitude of bilateral and multilateral funding initiatives, and through multilateral development banks (most notably, the World Bank).[89] There is no overarching mechanism that coordinates or controls these diverse and dispersed efforts.

Regarding climate finance outcomes from the COP-16, the Cancún COP-16 decision has started to lay the foundations for a scaled-up climate finance regime.[90] Most notably, the COP took note of the commitment by developed countries to provide US$30 billion in fast-start finance for the period of 2010-2012,[91] and invited parties to submit information to the secretariat regarding the resources that have been provided to meet this commitment.[92] Moreover, the COP recognized the developed countries' commitment to jointly mobilize US$100 billion a year by 2020 to address the needs of developing

[86] See http://www.thegef.org/gef/; see also http://www.climatefundsupdate.org/listing/gef-trust-fund. For an analysis, see Streck, C. "The Global Environment Facility – A Role Model for International Governance?" 2 *Global Environmental Politics*, 71, 2001.

[87] See http://www.climatefinanceoptions.org/cfo/node/147; see also http://www.climatefundsupdate.org/listing/adaptation-fund. For an analysis of the adaptation fund, see Brown, J. Bird, N. & Schalatek, L. "Direct Access to the Adaptation Fund: Realizing the Potential of National Implementing Entities," Heirich Böll Stiftung/ODI Climate Finance Policy Brief No. 3, November 2010.

[88] See http://cdm.unfccc.int/index.html.

[89] See http://www.climateinvestmentfunds.org/cif/.

[90] See Van Melle, T., Höhne, N. and Ward, M. "International Climate Financing: From Cancún to a 2 degree C Stabilisation Pathway," Ecofys, February 2011 (which examines potential sources of revenues and analyzes which instruments are most compatible with these sources and with the climate objectives. Ultimately, the paper provides suggestions for progress in international climate financing after Cancún towards a 2°C stabilization pathway).

[91] http://unfccc.int/files/meetings/cop_16/application/pdf/cop16_lca.pdf, para. 95.

[92] Ibid., para. 96.

countries,[93] and agreed that funds will come from a wide variety of sources, public and private, bilateral and multilateral, including alternative sources, given this amount cannot simply come from the public revenues of developed countries.[94] Furthermore, the COP decided that there should be enhanced reporting by developed countries in national communications of the provision of financial, technological and capacity-building support to developing countries, and that the guidelines for reporting and review of this information should be improved.[95] Besides, the COP decided that developing countries shall submit biennial reports containing updates (among other things) of support received.[96]

To sum up the COP-16, Cancún buried the failure of Copenhagen and provided opportunities to advance global cooperation in adaptation, forests, climate finance, technology transfer, and capacity-building. On the other hand, the Cancún Agreements also leave much to be desired.[97] This is particularly true in terms of mitigation, where a "pledge and review" system, first articulated in the Accord, has now become an accepted modality for developed country mitigation. Furthermore, the "pledge and review" system also places mitigation responsibilities with developing countries. What is then the significance of the Cancún outcome for the UNFCCC process and for the possible creation of a global climate agreement? What is the way forward?

[93] Ibid., para. 98.
[94] Ibid., para. 99.
[95] Ibid., para. 42.
[96] Ibid., para. 60 (c).
[97] See La Viña, A., Ang, L & Dulce, J. "The Cancún Agreements: Do they advance global cooperation on climate change?" Foundation for International Environmental Law and Development (which outlines and reflects on the circumstances that led to the Cancún Agreements, analyzes their substance and provides

3. Analyzing the Kyoto Protocol

The Kyoto Protocol addresses the issue of climate change. However, the legal document by no means reflects a global understanding on how to handle the issue of global warming.[98] In fact, the lack of understanding among the various nations of the world has reached a point where environmental policy-makers see a number of possible scenarios to global warming: 1) making amendments to the Kyoto Protocol, by changing the current targets and timetable into a long-term view of global warming;[99] 2) leaving the agreement unratified, given that the U.S. does not agree with the Kyoto Protocol; and 3) finding a middle ground between the two previous possibilities, which is the creation of a new mechanism where nations meet in international environmental *fora* and *voluntarily* exchange views with no legal commitments.

In order to move forward, we should stop thinking of global warming only from a cost-benefit point of view and instead take public health and safety requirements into account to a greater extent. Since U.S. and EU representatives have found themselves deadlocked at several *fora* such as in Morocco for the October 2001 COP-7 to the UNFCCC and more recently at the COP-15 in Copenhagen, some recommendations are made at the end of this article as to how to move forward.

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some insights over the future of global cooperation on climate change). See also "Understanding the 2010 Cancún Agreement," Energy Business Reports, December 2010.

[98] For a global analysis of the Kyoto Protocol, see Cameron, P. & Zillman, D. (eds.) *Kyoto: From Principles to Practice*, Kluwer, 2001; Victor, D. *The Collapse of the Kyoto Protocol and the Struggle to Slow Global Warming*, Princeton, NJ: Princeton University Press, 2001; Kushner, J. *Global Climate Change and the Road to Extinction: The Legal and Planning Response*, Durham, NC: Carolina Academic Press, 2009

[99] For an analysis of the long-term view of global warming, see Pachauri, R.K. and Reisinger, A. (eds.), *Climate Change 2007: Synthesis Report*, Cambridge University Press, 2007, Topic 5, pp. 63-70, available at http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf.

3.1. What is the Kyoto Protocol?

The main objective of the Protocol is to reduce worldwide emissions of GHG. Article 3.1 of the Kyoto Protocol shows three key variables used throughout the Protocol: 1) target: reduction of GHG emissions of Annex I countries by at least 5 per cent below the 1990 levels. Critics have been saying this target is unrealistic and far from solving global warming; 2) timetable: the period between 2008 and 2012; and 3) actors: only developed countries are legally bound; developing countries have no formal binding targets. In other words, the aim is the reduction of GHG emissions of developed countries by at least 5 per cent below the 1990 levels by the period 2008-2012.

Delegates to the Conference of the Parties (COP-3) to the UNFCCC agreed to the following provisions:

- **Developed Countries**—Thirty-eight developed countries plus the European Community (i.e., the European Union since the entry into force of the Treaty of Lisbon in 2009), listed in Annex B to the Kyoto Protocol, agreed to reduce their emissions of six GHG.[100] Collectively, developed countries agreed to cut back their GHG emissions by a total of at least 5 per cent below 1990 levels between 2008 and 2012.[101] The six gases include carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), and three ozone-damaging fluorocarbons not covered by the Montreal Protocol that banned global chlorofluorocarbons (i.e., hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6)).[102] The European Union agreed to reduce its emissions by 8

[100] See Annex A of the Kyoto Protocol for a list of the six greenhouse gases.
[101] Article 3.1 of the Kyoto Protocol.
[102] For an analysis of the lessons from the Montreal Protocol for climate change negotiators, see Smith, R. "The Road to a Climate Change Agreement Runs Through Montreal," *Peterson Institute for International Economics Policy Brief*, Number PB10-21, August 2010.

per cent below 1990 levels;[103] the United States signed on to a 7 per cent reduction; and Japan agreed to a 6 per cent reduction. Some countries with smaller economies such as Iceland,[104] Australia,[105] and Norway,[106] were allowed to actually increase their emissions relative to 1990 levels (respectively 10 per cent, 8 per cent, and 1 per cent)[107] before the 2009 Copenhagen Accord. Other countries were allowed to stay at the same level as in 1990, i.e., New Zealand.[108] The rest of the industrialized countries are to reduce their emissions by between 6 per cent and 8 per cent from 1990 levels in the period 2008–2012. They must comply with the limits by 2012.

However, the 2009 non-binding Copenhagen Accord defines new targets and new constraints. For example, Norway expressed its will to reduce emissions by 40 per cent by 2020 based on the 1990 levels, provided that major emitting Parties agreed to adequate emission reductions in line with the 2 degrees Celsius target.[109] In the same way, Australia aims at a 5 to 15-25 per cent reduction based on 2000 levels by 2020, whereas New Zealand aims at 10-20 per cent below the 1990 levels by 2020.[110] Thus, none of the countries that formerly benefited from the possibility to increase or to keep

[103] On the EU's climate policy from a legal perspective, see Massai, L. "Legal Challenges in European Climate Policy," in Douma, W., Massai, L. & Montini, M. (eds.) *The Kyoto Protocol and Beyond: Legal and Policy Challenges of Climate Change*, The Hague: TMC Asser Press, 2007, pp. 13-27.

[104] For a summary of Iceland's GHG emissions from 1990 to 2008, see http://unfccc.int/files/ghg_emissions_data/application/pdf/isl_ghg_profile.pdf.

[105] For a summary of Australia's GHG emissions from 1990 to 2008, see http://unfccc.int/files/ghg_emissions_data/application/pdf/aus_ghg_profile.pdf.

[106] For a summary of Norway's GHG emissions from 1990 to 2008, see http://unfccc.int/files/ghg_emissions_data/application/pdf/nor_ghg_profile.pdf.

[107] Annex B of the Kyoto Protocol.

[108] For a summary of New Zealand's GHG emissions from 1990 to 2008, see http://unfccc.int/files/ghg_emissions_data/application/pdf/nzl_ghg_profile.pdf.

[109] See letter by the Norwegian minister of the environment, "The Copenhagen Accord – Norway's emissions targets," 29 January 2010, available at http://unfccc.int/files/meetings/application/pdf/norwaycphaccord_app1.pdf.

[110] UNFCCC, "Appendix I - Quantified economy-wide emissions targets for 2020," available at http://unfccc.int/home/items/5264.php.

constant their emissions will be given further flexibility. All national emissions are to be reduced, although these targets are not binding.

- **Countries undergoing the process of transition to a market economy**—In the pre-Copenhagen Accord era, countries undergoing the process of transition to a market economy but also classified along with the EU, Japan, and the U.S. as Annex I parties to the UNFCCC—including Russia[111] and Ukraine among others—were expected to freeze their emissions at the 1990 levels but were not bound to make any reductions. Since the Copenhagen Accord, Russia is willing to reduce its emissions by 15-25 per cent below the 1990 levels by 2020, whereas Ukraine by 20 per cent below the 1990 levels.[112]

- **Developing Countries**— Most developing countries are parties to the Protocol, but are not subject to any emissions limitations obligations. Countries in the process of becoming industrialized but possessing limited resources with which to combat their environmental problems—including China and India—have no formal binding targets, but have the option to set voluntary reduction targets. Developing countries on the whole support Kyoto because it allocates binding targets for emissions reductions and applies only to industrialized nations. According to the emerging economies, industrialized countries have been responsible for the vast majority of CO2 in the atmosphere. However, recent data show that the developing world is responsible for the majority of the world's GHG emissions. This trend is only projected to increase.[113]

[111] On Russia and the Kyoto Protocol, see Douma, W. & Ratsiborinskaya, D. "The Russian Federation and the Kyoto Protocol," in Douma, W., Massai, L. & Montini, M. (eds.) *The Kyoto Protocol and Beyond: Legal and Policy Challenges of Climate Change*, The Hague: TMC Asser Press, 2007, pp. 135-145.
[112] UNFCCC, "Appendix I - Quantified economy-wide emissions targets for 2020," available at http://unfccc.int/home/items/5264.php.

3.2. Main Points of the Kyoto Protocol

The Kyoto Protocol makes the following points:

1) The Protocol was opened for signature for one year starting 16 March 1998.

The Protocol was adopted at the third session of the Conference of the Parties to the 1992 UNFCCC, held at Kyoto from 1 to 11 December 1997. The Kyoto Protocol was open for signature by States and regional economic integration organizations which are Parties to the Convention at the United Nations Headquarters in New York from 16 March 1998 to 15 March 1999 in accordance with its Article 24.1. The Kyoto Protocol entered into force on 16 February 2005 in accordance with Article 25.1, that is "the ninetieth day after the date on which not less than 55 Parties to the Convention, incorporating Parties included in Annex I which accounted in total for at least 55 per cent of the total carbon dioxide emissions for 1990 of the Parties included in Annex I, have deposited their instruments of ratification,[114] acceptance, approval or accession."[115]

2) Each country's emissions target must be achieved by the period 2008-2012. It will be calculated as an average over the five years. "Demonstrable progress" must have been made by 2005.[116] Cuts in the three most important gases responsible for causing global warming—carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O)—will be measured against a base year of 1990 (with exceptions for some countries with

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[113] For a country comparison of CO2 emissions between 1990 and 2007, see Millennium Development Goals Indicators, available at http://mdgs.un.org/unsd/mdg/SeriesDetail.aspx?srid=749&crid=.

[114] (*footnote not in original text*) Ratification defines the international act whereby a State indicates its consent to be bound to a treaty if the parties intended to show their consent by such an act. In the case of multilateral treaties, the usual procedure for ratification is for the depositary to collect the ratifications of all States, keeping all parties informed of the situation. The institution of ratification grants States the necessary time-frame to seek the required approval for the treaty on the domestic level and to enact the necessary legislation to give domestic effect to that treaty. See Articles 2(1)(b), 14(1), and 16 of the Vienna Convention on the Law of Treaties, 1969.

[115] Article 25.1 of the Kyoto Protocol.

economies in transition). Cuts in three long-lived industrial gases—hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF6)—can be measured against either a 1990 or 1995 baseline.[117] The Protocol's first commitment period (2008-2012) for reducing greenhouse gas emissions will conclude at the end of 2012.[118]

3) Since emissions levels would increase without a Protocol, actual emission reductions will be much larger than 5 per cent. Many industrialized countries did not succeed in meeting their earlier non-binding aim of returning emissions to 1990 levels by the year 2000, so their emissions have in fact risen since 1990. Compared to emissions levels that would have been expected by 2010 without emissions-control measures, the Protocol target represents a 29 per cent cut.

4) Certain degree of flexibility given to countries in how they make and measure their emission reductions. In particular, an international "emissions trading" regime[119] will be established, allowing industrialized countries to buy and sell emissions credits amongst themselves. Countries will also be able to acquire "emission reduction units"[120] by financing certain kinds of projects in other developed countries. In addition, a "clean development mechanism"[121] will enable industrialized countries to finance emissions-reduction projects in developing countries and to receive credit for doing so.[122] The operational guidelines for these various schemes must still be further elaborated.[123]

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[116] Article 3.2 of the Kyoto Protocol.
[117] Article 3.8 of the Kyoto Protocol.
[118] Article 3.1 of the Kyoto Protocol.
[119] For verification, reporting and accountability for emissions trading, see Article 17 of the Kyoto Protocol.
[120] Article 3.10 of the Kyoto Protocol.
[121] Article 12 of the Kyoto Protocol.
[122] On climate finance, see Stewart, R., Kingsbury, B. and Rudyk, B. (eds.), *Climate Finance: Regulatory and Funding Strategies for Climate Change and Global Development*, NYU Press, 2009 (which examines

5) Countries will pursue emission reduction in a wide range of economic sectors. The Kyoto Protocol encourages governments to cooperate with one another and to improve energy efficiency, reform their energy and transportation sectors, promote renewable forms of energy, phase out inappropriate fiscal measures and market imperfections, limit methane emissions from waste management and energy systems, and protect forests and other carbon "sinks."[124]

6) The Protocol will advance the implementation of existing commitments by all countries. Both developed and developing countries agree to take measures to limit emissions and promote adaptation to future climate change impacts; submit information on their national climate change programs and inventories; promote technology transfer; cooperate on scientific and technical research; and promote public awareness, education, and training. The Protocol also reiterates the need to provide "new and additional"[125]

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the design of climate finance mechanisms, as well as the institutions and governance mechanisms required to ensure that the decentralized climate finance system functions effectively); see also Enting, K. & Harmeling, S. "German Climate Finance Put to the Test: An Assessment of German Financial Support for Climate-Related Activities in Developing Countries from a Development Policy Perspective," Stuttgart, Germanwatch, November 2010; Pew Center, "Strengthening International Climate Finance," December 2010, available at http://www.pewclimate.org/docUploads/strengthening-international-climate-finance.pdf.

[123] For literature on GHG emission reduction, see Keohane, R. & Victor, D. "The Regime Complex for Climate Change," Discussion Paper 2010-33, Cambridge, Mass.: Harvard Project on International Climate Agreements, January 2010; Stavins, R.N., "Options for the Institutional Venue for International Climate Change Negotiations," Issue Brief 10-03, Harvard Project on International Climate Agreements, May 2010; Pacala, S. & Socolow, R. "Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies," *Science*, Vol. 305, p. 968, 13 August 2004; Stewart, R. & Wiener, J. *Reconstructing Climate Policy: Beyond Kyoto*, Washington, D.C.: American Enterprise Institute, 2003, Chapter 3; Victor, D. "Fragmented carbon markets and reluctant nations: implications for the design of effective architecture," in Aldy, J.E. & Stavins, R. (eds.) *Architectures for Agreement: Addressing Global Climate Change in the Post-Kyoto World*, New York: Cambridge University Press, 2007, pp. 133-160; Yu, J. "Greenhouse Gas Emissions and Mitigation Measures in China," in Stewart, R., Kingsbury, B. & Rudyk, B. (eds.) *Climate Finance: Regulatory and Funding Strategies for Climate Change and Global Development*, NYU Press, 2009, pp. 228-233; Lizza, R. "How the Senate and the White House Missed their best Change to deal with Climate Change," *The New Yorker*, 11 October 2010.

[124] Article 2.1(a)(ii) of the Kyoto Protocol.

[125] Article 11.2(a) of the Kyoto Protocol.

financial resources to meet the "agreed full costs"[126] incurred by developing countries in carrying out these commitments.

7) The Kyoto Protocol will be periodically reviewed. The Kyoto Protocol mandates that the Parties take "appropriate action"[127] on the basis of the best available scientific, technical, and socio-economic information. The first review took place in 2006 at the second COP serving the Protocol.[128] Talks on commitments for the post-2012 period[129] started in 2005 to discuss future commitments for industrialized countries under the Kyoto Protocol. The Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol established a working group in December 2005 called the *Ad Hoc* Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol (AWG-KP) in an effort to agree to terms for a second commitment period for emissions limitations post-2012. However, since the Protocol's second commitment period is only for developed countries, there is some skepticism as to whether there is any added value for the EU finding itself alone in a second commitment period of the Kyoto Protocol, given that Japan, China, the U.S., Canada, and Russia are probably not going to join, since they have been signaling their opposition to an extension of the Kyoto Protocol, and many developing countries still insist that they should not be subject to binding limitations under the Kyoto Protocol. Therefore, the prospects of reaching such an

[126] Article 11.2(a) of the Kyoto Protocol.
[127] Article 9.1 of the Kyoto Protocol.
[128] To access the reports of the review, visit http://unfccc.int/meetings/cop_12/items/3754.php.
[129] 2012 is the date in which the first commitment of the Kyoto Protocol comes to an end. It is therefore wrong to claim that post-2012 refers to the end of the Kyoto Protocol. For an analysis of climate change governance beyond 2012, see Biermann, F., Pattberg, P., and Zelli, F. (eds.) *Global Climate Governance Beyond 2012: Architecture, Agency and Adaptation*, Cambridge University Press, 2010 (addressing three questions central to any new climate agreement: What is the most effective overall legal and institutional architecture for successful and equitable climate politics? What role should non-state actors play, including multinational corporations, non-governmental organizations, public–private partnerships, and market

agreement are slim. With no agreement having emerged from the 2009 COP-15 in Copenhagen, the future of the Kyoto Protocol, which would require negotiation of emission targets for the period post-2012, is in serious doubt.

3.3. Major Mechanisms of the Kyoto Protocol

Under the Kyoto Protocol, countries must meet their targets primarily through national measures. However, the Kyoto Protocol offers them an additional means of meeting their targets by way of three market-based mechanisms to increase flexibility and reduce the costs of making emissions cuts: 1) the clean development mechanism (CDM),[130] 2) emissions trading,[131] and 3) joint implementation. Flexibility would mean that the same goals could be met at lower cost, since where the reductions occur is irrelevant to total atmospheric accumulation of GHG.

1) The *clean development mechanism*, which is reflected in Article 12 of the Protocol, enables industrialized countries with an emissions-limitation commitment to finance emissions-avoiding projects (including through initiative and investment by their private firms) in developing countries and to receive credit for doing so by splitting the resulting tradable credits between the two countries. This would offer an incentive for industrial firms to invest in projects that reduce emissions from developing countries. It also allows wealthy countries to earn marketable certified emissions reduction credits (CERs),[132] which can be counted toward meeting their emission reduction targets under

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mechanisms in general? How can we deal with the growing challenge of adapting our existing institutions to a substantially warmer world?).

[130] Article 12 of the Kyoto Protocol.

[131] Article 17 of the Kyoto Protocol.

[132] See UNFCCC, CDM Statistics, available at http://cdm.unfccc.int/Statistics/index.html.

the Kyoto Protocol. Private firms that invest in CDM projects can obtain CERs to use against their GHG regulatory limitations requirements in developed countries where they operate, or sell CERs in global carbon markets. However, no agreement has been reached on how to put this mechanism into practice. Making the CDM work will be very difficult,[133] but there is no real alternative for engaging developing countries in a worldwide effort to control emissions while ensuring that industrialized countries rightly pay for most of the cost.

The CDM has two main objectives: first, to stimulate investment in emissions reductions in developing countries; and second, to give industrialized countries some flexibility and potential cost savings in how they meet their emissions reduction targets. Because several of the main GHGs, particularly carbon dioxide, are nearly uniformly distributed throughout the atmosphere regardless of location of emissions, it is irrelevant from an environmental viewpoint where in the world emissions limitations are achieved. Also, it is often much cheaper to achieve GHG emissions reductions in developing countries than in developed countries.

The clean development mechanism has been operational since 2006. More than 2,300 projects are registered with an annual average of more than 380,000,000 CERs (in tons of CO2). Even if no agreement has been reached on how to put this mechanism into practice, it has been improved through two decisions, the first one adopting modalities,

[133] See Campbell, D. *et al*., "After Copenhagen: The Impossibility of Carbon Trading," *LSE Law, Society and Economy Working Papers*, No. 22/2010 (arguing that carbon trading—which will reduce emissions in line with any of the targets set for avoiding dangerous anthropological interference—is impossible and that, reflecting the fatal shortcomings of the Kyoto Protocol, the operation of the CDM so far has not merely failed to secure reductions, but in all likelihood has actually increased the absolute level of emissions).

procedures, and guidance on the CDM in 2005.[134] In 2009, a second decision was adopted providing further guidance on the CDM.[135]

2) *Emissions trading* is a mechanism whereby Parties with emissions commitments (Annex I countries)[136] may trade their emission allowances with other Parties. The aim is to improve the overall flexibility and economic efficiency of making emissions cuts. This mechanism would allow industrialized countries to buy excess emissions permits from Russia and Ukraine, for instance, since they both have a large surplus resulting from economic collapse and emissions are likely to be much lower than their targets.[137] Such transfers will do little or nothing to help slow global warming while they will inevitably enrich Russian and Ukrainian oligarchs.

Another problem is that the EU countries, on one side, and the U.S., Norway, and Japan, on the other, have had radically different views on the use of emissions trading credits and no compromise seemed possible up to 2005.[138] The EU's policy was that at least 50 per cent of each country's obligation should be fulfilled domestically.[139] However, the U.S., Japan, and Norway wanted what their representatives call qualitative

[134] See UNFCCC, "Action taken by the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol at its first session," FCCC/KP/CMP/2005/8/Add.1, 3/CMP.1 and 4/CMP.1, pp. 6-60, 2005, available at: http://unfccc.int/resource/docs/2005/cmp1/eng/08a01.pdf.

[135] See UNFCCC, "Action taken by the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol at its fifth session," pp. 1-8, 2009, available at http://unfccc.int/files/meetings/cop_12/application/pdf/cmp_8.pdf.

[136] For a list of Annex I Parties to the UNFCCC, see http://unfccc.int/parties_and_observers/parties/annex_i/items/2774.php.

[137] On emissions permits, see Bossley, L. "Are Current Trade Rules Sufficient for Regulating Trade in Emissions Permits?" in Pauwelyn, J. (ed.) *Global Challenges at the Intersection of Trade, Energy and the Environment*, Geneva: Centre for Trade and Economic Integration, 2010, pp. 161-164.

[138] See Sains, A. "Laying an Egg in The Hague. No Deal reached at Global Warming Conference" in *Europe*: *The Green Issue*, published by the Delegation of the European Commission to the U.S., February 2001, pp. 10-13, at 11.

[139] For the case of the EU emissions trading directive, see Farnsworth, N. "The EU Emissions Trading Directive: Time for Revision?" in Douma, W., Massai, L. & Montini, M. (eds.) *The Kyoto Protocol and Beyond: Legal and Policy Challenges of Climate Change*, The Hague: TMC Asser Press, 2007, pp. 29-38.

evaluations. This concept essentially implies the right to evaluate emissions at home and efforts to cut emissions abroad on a case-by-case basis and not be tied to a 50 per cent domestic requirement.[140] Those who are entirely against emissions trading say this practice will allow wealthier industrialized countries to avoid the responsibility of reducing their greenhouse gas emissions at home, and dump the problem on developing countries instead.[141]

However, the rules in emissions trading were improved in 2005 by a decision providing modalities, rules, and guidance.[142] These rules have progressively evolved into a *de facto* carbon market.

3) Last but not least, under the *joint implementation* concept, the Kyoto Protocol establishes a mechanism whereby a developed country can receive "emissions reduction units"[143] when it helps to finance projects that reduce net emissions in another developed country (including countries with economies in transition). Some aspects of this approach are being tested as *Activities Implemented Jointly* (AIJ),[144] which means that under a pilot phase that ended in 2000, these activities could be carried out through partnership

[140] Sains, A. "Laying an Egg in The Hague. No Deal reached at Global Warming Conference" in *Europe*: *The Green Issue*, published by the Delegation of the European Commission to the U.S., February 2001, pp. 10-13, at 11.
[141] Ibid. at 13.
[142] See UNFCCC, "Action taken by the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol at its first session", FCCC/KP/CMP/2005/8/Add.2, 11/CMP.1, pp. 17-21, 2005, available at http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=17.
[143] Article 3.10 & 11 of the Kyoto Protocol.
[144] Activities implemented jointly (AIJ) refers to "the pilot phase for Joint Implementation, as defined in Article 4.2(a) of the United Nations Framework Convention on Climate Change (UNFCCC) that allows for project activity among developed countries (and their companies) and between developed and developing countries (and their companies). AIJ is intended to allow parties to the UNFCCC to gain experience in jointly implemented projects. There is no credit for AIJ during the pilot phase. A decision remains on the future of AIJ projects and how they may relate to the Kyoto mechanisms. As a simple form of tradable permits, AIJ and other market-based schemes represent potential mechanisms for stimulating additional resource flows for reducing emissions." See http://www.ipcc.ch/publications_and_data/ar4/syr/en/annexessglossary-a-d.html.

between an investor from a developed country and a counterpart in a host country. The purpose is to involve private-sector money in the transfer of technology and know-how.[145] The concept of joint implementation has been part of global climate policy-making since its inclusion in the UNFCCC in 1992. Article 4.2 of the UNFCCC states that "developed country Parties and other Parties included in annex I […] may *implement* […] policies and measures *jointly* with other Parties and may assist other Parties in contributing to the achievement of the objective of the Convention…".[146]

The joint implementation mechanism has also been defined through guidelines in a 2005 decision.[147] In particular, a Joint Implementation Supervisory Committee was created, that is responsible for supervising of the verification procedure of the guidelines.[148] The Committee has been meeting on average four times a year since 2006 and produces guidance and procedural improvement.[149] Technical improvements were also included during the 2009 Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP).[150]

[145] For an analysis of the role of joint implementation in the EU context, see van der Gaast, W. "The Role of Joint Implementation within the Context of EU Policies," in Douma, W., Massai, L. & Montini, M. (eds.) *The Kyoto Protocol and Beyond: Legal and Policy Challenges of Climate Change*, The Hague: TMC Asser Press, 2007, pp. 39-57.
[146] Emphasis added.
[147] UNFCCC, "Guidelines for the implementation of Article 6 of the Kyoto Protocol," FCCC/KP/CMP/2005/8/Add.2, 9/CMP.1, pp. 2-14, 2005, available at http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=2.
[148] Ibid. at paras. 30-45.
[149] Reports of the meetings are available at http://ji.unfccc.int/Sup_Committee/Meetings/index.html.
[150] UNFCCC, "Action taken by the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol at its fifth session", p. 12, 2009, available at http://unfccc.int/resource/docs/2009/cmp5/eng/21a01.pdf#page=12.

3.4. Problems with the Kyoto Protocol

The question is whether the Kyoto Protocol is a positive and effective legal instrument to address climate change. One could argue that the Protocol is a positive sign, since it acknowledges the problem. However, for others, the Kyoto Protocol is both far too strong (the fulfillment of its objective implies a high economic cost[151] and it would require a high economic sacrifice for some countries)[152] and yet totally inadequate to address the long-term climate challenge (in other words, it requires only a small percentage of GHG emission reduction—5 per cent—below 1990 levels between 2008 and 2012 from only few countries, i.e., only developed countries).[153] So, even if we fulfill the Kyoto Protocol's requirement, we do not even come close to curbing the problem. Worse, the Protocol incorporates dangers that could make solutions even more difficult.

Despite all this, U.S. President G.W. Bush said that he did not agree with the current implications of the Kyoto Protocol, since 80 per cent of the world (i.e., developing countries) is not legally bound by the agreement.[154] His argument was that there were other priorities in his political agenda. According to President G.W. Bush, the energy crisis in the U.S., especially in California, in 2000-2001 was an immediate problem which had to be solved, whereas the environment is a long-term problem. My

[151] See generally House of Lords, "The Economics of Climate Change," Volume I: Report, Select Committee on Economic Affairs, 2005.
[152] In this sense, William Antholis and Strobe Talbott note that the word 'sacrifice', just like the word 'tax', has become almost a taboo in American political discourse. See Antholis, W. and Talbott, S. *Fast Forward: Ethics and Politics in the Age of Global Warming*, Washington, D.C.: Brookings Institution Press, 2010, p. 114.
[153] See, among those against the Kyoto Protocol, Benedick, R. "How Workable is the Kyoto Protocol? How to Salvage the Kyoto Protocol," Weathervane, March 1998.
[154] Brown-Humes, C., Norman, P. & Woffle, R. "EU confronts Bush on climate change," in *Financial Times*, March 25, 2001.

conclusion, therefore, is that the G.W. Bush administration killed the Kyoto Protocol and should have been responsible for an alternative.

The Kyoto Protocol tries to address a long-term problem with unfeasible short-term measures. For the purpose of this article, we shall focus on two main technical-procedural problems: 1) implementation and 2) enforcement mechanism.

1. *Implementation* (Article 18 of the Kyoto Protocol). This was discussed in Bonn in 1999, but unfortunately little progress was made. This means that we still need regimes sufficiently detailed with regard to the implementation of international environmental agreements. Article 18 of the Kyoto Protocol clearly says that

> "parties shall approve appropriate and effective procedures and mechanisms to determine and address cases of non-compliance."

To work out the rules implementing the vague and general language of the Protocol was actually the purpose of the first part of the COP-6, which met in The Hague in November 2000.[155] The whole negotiation collapsed due to the desire of the U.S. to include carbon sinks as part of the agreement. While a compromise had been prepared, the EU rejected the proposal. The negotiation was thus postponed, and took place during the second COP-6, held in Bonn in July 2001. Several issues were agreed, in particular on the Kyoto mechanisms and on the compliance system,[156] as prepared under the Buenos Aires Plan of Action.[157]

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[155] Anderson, J.W., "Climate Change Diplomacy: The Next Step," in *Resources*, Winter 2001, Issue Number 142, pp. 11-13, at 11.
[156] Ott, H.E. "The Bonn Agreement to the Kyoto Protocol – Paving the Way for Ratification," *International Environmental Agreements: Politics, Law and Economics*, Vol. 1, No. 4, pp. 469–476, at 472-475, 2001.
[157] The UNFCCC COP-4 adopted a Buenos Aires Action Plan, a two-year plan of action to reduce the risk of global climate change by establishing deadlines for finalizing work on the Kyoto Mechanisms (Joint

The industrialized countries (all except the U.S.) that have committed to legally binding emissions reductions under the Kyoto Protocol are seeking to implement them, to greater or lesser effect. However, their efforts fall far short of what is required to avoid dangerous anthropogenic interference with the climate system.

2. *Enforcement mechanism.* Enforcement is difficult with any international environmental agreement. The Protocol has to find a way to come up with a workable and credible compliance regime of emission-reduction rules. To this end, the *Joint Working Group on Compliance* (JWG) was established under the Buenos Aires Plan of Action, which has been operating since June 1999. In December 2000 in The Hague there was a meeting to further develop the Kyoto Protocol's enforcement mechanism, but there was no plan for how countries would comply with their targets.[158]

One major issue raised in post-Hague negotiations was whether there should be financial penalties for non-compliance.[159] Indeed, the 2001 COP-7 ended with an agreement on how to enforce the Kyoto Protocol, following the Buenos Aires Plan of Action. The package included decisions on compliance rules, the so-called "flexible mechanisms," and monitoring and reporting obligations for Parties. To this end, the 2005 COP-11 agreed to a compliance regime for the Kyoto Protocol. The Compliance

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Implementation, Emissions Trading, and the Clean Development Mechanism), compliance issues and policies and measures.

[158] On compliance, see Montini, M. "The Compliance Regime of the Kyoto Protocol," in Douma, W., Massai, L. & Montini, M. (eds.) *The Kyoto Protocol and Beyond: Legal and Policy Challenges of Climate Change*, The Hague: TMC Asser Press, 2007, pp. 95-109.

[159] On non-compliance and its consequences, see Tabau, A.-S. & Maljean-Dubois, M. "Non-Compliance Mechanisms: Interaction between the Kyoto Protocol System and the European Union," *European Journal of International Law*, Vol. 21, No. 3, 2010, pp. 749-763.

Committee is elected and has two branches, namely, the facilitative branch and the enforcement branch.[160]

The facilitative branch shall provide "advice and facilitation to Parties in implementing the Protocol,"[161] whereas the enforcement branch is responsible for determining whether a Party included in Annex I is not in compliance with its emissions targets, its methodological and reporting requirements for greenhouse gas inventories, and its eligibility requirements under the mechanisms. The sanctions associated with this mechanism have been criticized. For example, the potential consequences that sanctions could have on countries that comply with the agreement, such as considerable adverse welfare effects.[162] However, even though it still needs improvement, the enforcement mechanism has proven to be effective.[163] The enforcement branch issues reports of meetings twice a year.[164]

A way to convince nations to comply is by demonstrating that it is in their self-interest to do so. Compliance does not seem probable through punitive sanctions (because countries will not accept that), but perhaps countries will ultimately decide to comply to avoid appearing uncooperative. The compliance mechanism provides, nevertheless, three

[160] For a description of the mechanism relating to compliance under the Kyoto Protocol, see UNFCCC, (2005), "Action taken by the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol at its first session", FCCC/KP/CMP/2005/8/Add.3, 27/CMP.1, p. 93, available at http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=92.
[161] Ibid., at p. 95.
[162] Hovi, J. and Kallbekken, S. "The Price of Non-compliance with the Kyoto Protocol: The Remarkable Case of Norway," *CICERO Working Paper* 2004:07, Oslo, June 2004, available at http://www.cicero.uio.no/media/2773.pdf.
[163] For a full assessment of the enforcement mechanism, see Finus, M. "The enforcement mechanisms of the Kyoto protocol: flawed or promising concepts?" *Letters in Spatial and Resource Sciences*, Vol. 1, No. 1, pp. 13-25, 2008. The effectiveness of each sanction is assessed, especially on pages 19 to 23. Overall, the mechanism is deemed effective, but should be improved to ensure more credibility and deter free-rider situations.
[164] Reports of the meetings of the enforcement branch can be found at http://unfccc.int/kyoto_protocol/compliance/enforcement_branch/items/3785.php.

types of sanctions that can be imposed by the enforcement branch in case of non-compliance of a country with its Kyoto commitments.[165] Each type of non-compliance triggers a specific course of action. For example, if it is deemed that a Party has exceeded its assigned emissions amount, then that Party is declared in non-compliance and must make up the difference between its emissions and its assigned amount during the second commitment period, with an added deduction of 30 per cent. The Party is then required to submit a compliance action plan and is declared ineligible to make transfers under the emissions trading provisions.[166]

3.5. What Options Do We Have Under the Current Situation?

Of all the countries that signed the Kyoto Protocol, the U.S. is the only one that has not yet ratified it and therefore is not subject to emissions limitations obligations because it is not a party to the Protocol. Since the aim is to contribute toward progress on tackling climate change while nonetheless ensuring that U.S. vital interests be protected, we have three options. The first option is to continue with the Kyoto Protocol (with or without the U.S.), assuming that eventually diplomatic and political pressure will make the U.S. Senate ratify the agreement. The EU is prepared to go much further and faster than the U.S. since it accepts the necessary level of economic sacrifice in order to solve this long-

[165] The list of punitive consequences to be imposed by the enforcement branch in the second commitment period (2013-2017) on countries that fail to comply in the first period are: (1) deduction from the party's allowance for the second commitment period of 1.3 times the amount of excess emissions in the first period; (2) development of a compliance action plan; and (3) suspension of the eligibility to sell permits under the emissions trading provisions until that right is reinstated.

[166] See Article 14 of the Agreement on procedures and mechanisms on compliance supplementing the Kyoto Protocol to the UNFCCC, FCCC/CP/2001/2/Add.6, 11 June 2001, available at http://unfccc.int/resource/docs/cop6secpart/02a06.pdf.

term problem.[167] One interpretation is that the Europeans adopted an intransigent position at the COP-6 in The Hague precisely because they predicted the impossibility for everyone to achieve their emission reduction goals. They therefore intentionally made things so difficult that the U.S. threw in the towel and took the public blame for "killing Kyoto."

In fact, in 2000 the only EU countries that were close to meeting Kyoto goals were Germany (which actually got there by closing down inefficient East German industries—for economic, not environmental reasons), and the United Kingdom, which essentially just stopped subsidizing its costly and inefficient coal industry and switched to cheaper cleaner national gas, which it has in plentiful supply. The UK's idea of stopping fossil-fuel subsidies is essential for reducing energy price distortions, encouraging energy conservation and efficiency, reducing greenhouse gas emissions, and lowering barriers to investments in renewable energy technologies. In other words, both Germany and the United Kingdom were positioned to achieve Kyoto goals painlessly.

Years later, the 2005 European Environment Agency report revealed that only the UK and Sweden, and possibly France and Germany, were on track to meet their emission reduction obligations under the EU bubble.[168] However, by 2010 the EU-27 as a bloc had made considerable progress to their target of cutting emissions by 20 per cent by 2020 compared to 1990, and was therefore in a good position to meet the targets imposed by the Kyoto Protocol.[169] In part due to the 2008 economic recession, the EU as a whole is

[167] See Jehl, D. "U.S. Rebuffs European Plea Not to Abandon Climate Pact," *The New York Times*, April 4, 2001, p. A 16.
[168] European Environment Agency, "Greenhouse Gas Emission Trends and Projections in Europe," Report No. 8, 2005, p. 14, available at http://www.eea.europa.eu/publications/eea_report_2005_8/GHG2005.pdf.
[169] European Environmental Agency, "Recession accelerates the decline in EU greenhouse gas emissions," 10 September 2010, available at http://www.eea.europa.eu/highlights/recession-accelerates-the-decline-in.

already halfway to the self-imposed Copenhagen Accord target of cutting emissions by 20 per cent by 2020 compared to 1990.[170]

The second option is to create a new legal framework that will be convincing to the U.S. and major developing countries such as China, since the Kyoto Protocol is failing in part due to its short timetables. How can we create a new legal framework? There are three plausible scenarios: a) by having a longer time-frame for GHG emission reductions (from the current time-frame of 2008-2012 required by the Protocol to a new one of 2050); b) with a greater level of emission reduction (from 5 per cent to 35 per cent); and c) with a larger number of countries involved (not only developed nations—as in the current situation—but also developing nations).

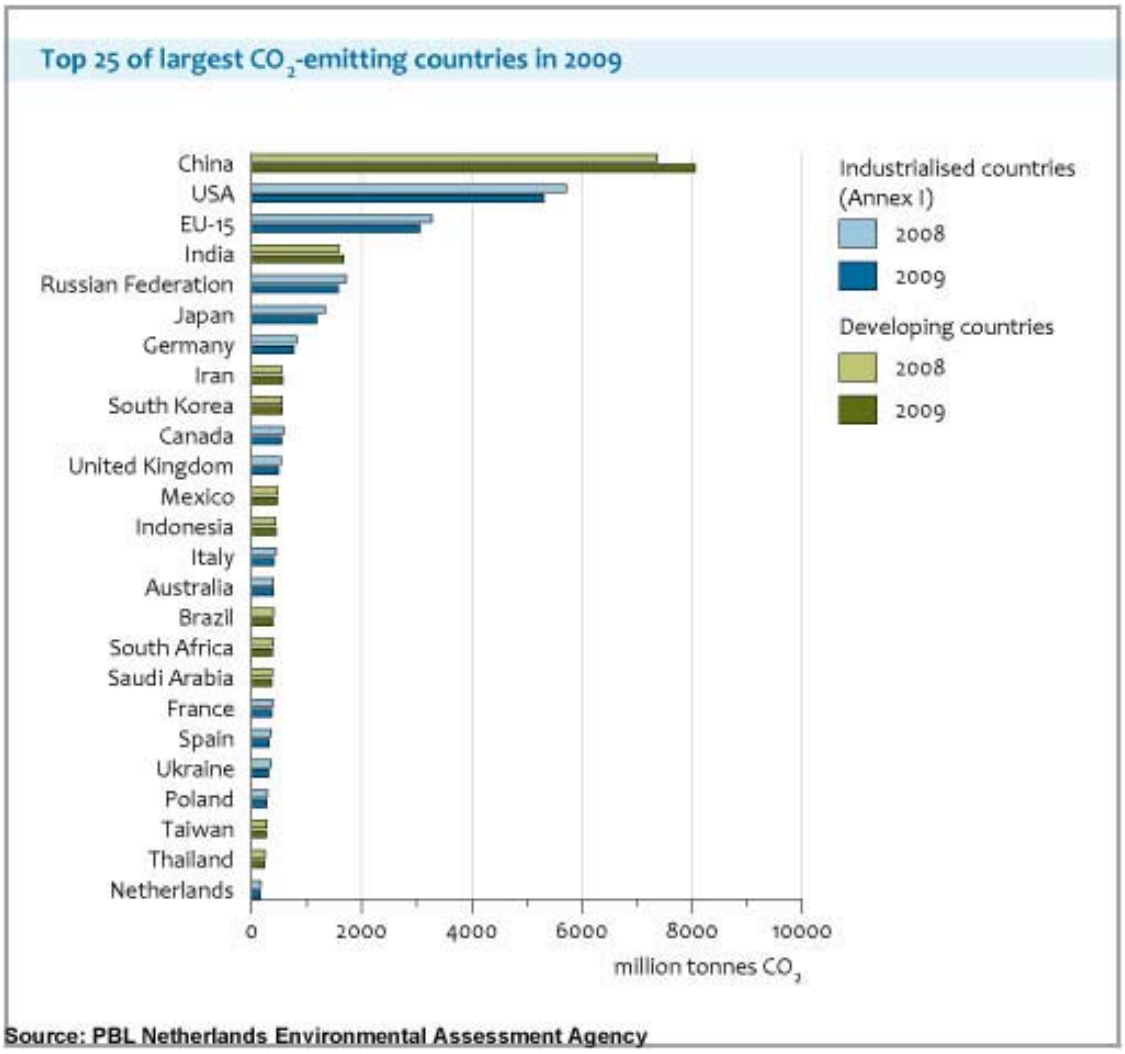
A "third way"[171] would be to create a two-speed protocol on climate change with a dual timetable.[172] This proposal consists of halving the emission reductions currently required by the Kyoto Protocol for industrialized nations. This may not be an optimal choice from an environmental perspective. However, given the current political circumstances in the U.S. concerning the environment, this modification of reduction requirements of the Kyoto Protocol may be the only way to move forward on a global scale. Halving the emissions cuts and creating a timetable of binding reductions for developing nations, provides an incentive for the U.S. administration to commit to Kyoto.

[170] For a full report on the performance of each EU Member State on greenhouse gas emission reduction from 1990 to 2008, see European Environment Agency, *Annual European Union greenhouse gas inventory 1990-2008 and inventory report 2010*, Luxembourg: Office for Official Publications of the European Communities, 2010.
[171] The notion of "third way" has been borrowed from Anthony Giddens, *The Third Way: The Renewal of Social Democracy*, Polity Press, 1998.
[172] See recommendation number 5 in this article.

4. Position of the Main Players

Although climate change is a truly global issue, for the purposes of this article only three main players in the global climate change negotiations will be analyzed: the U.S., the EU, and China. Each one of them is geographically and socially diverse, which is taken into account when analyzing them. Furthermore, as shown in the chart below, China, the U.S., and the EU-27 are the world's first, second, and third largest emitters of CO2 respectively,[173] and the EU has some of the strongest domestic support to address the climate change challenge.

[173] See the ranking of the world's countries by 2007 total CO2 emissions from fossil-fuel burning, cement production, and gas flaring prepared by Thomas Boden, Gregg Marland, and Robert Andres of the Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, available at http://cdiac.ornl.gov/trends/emis/top2007.tot.

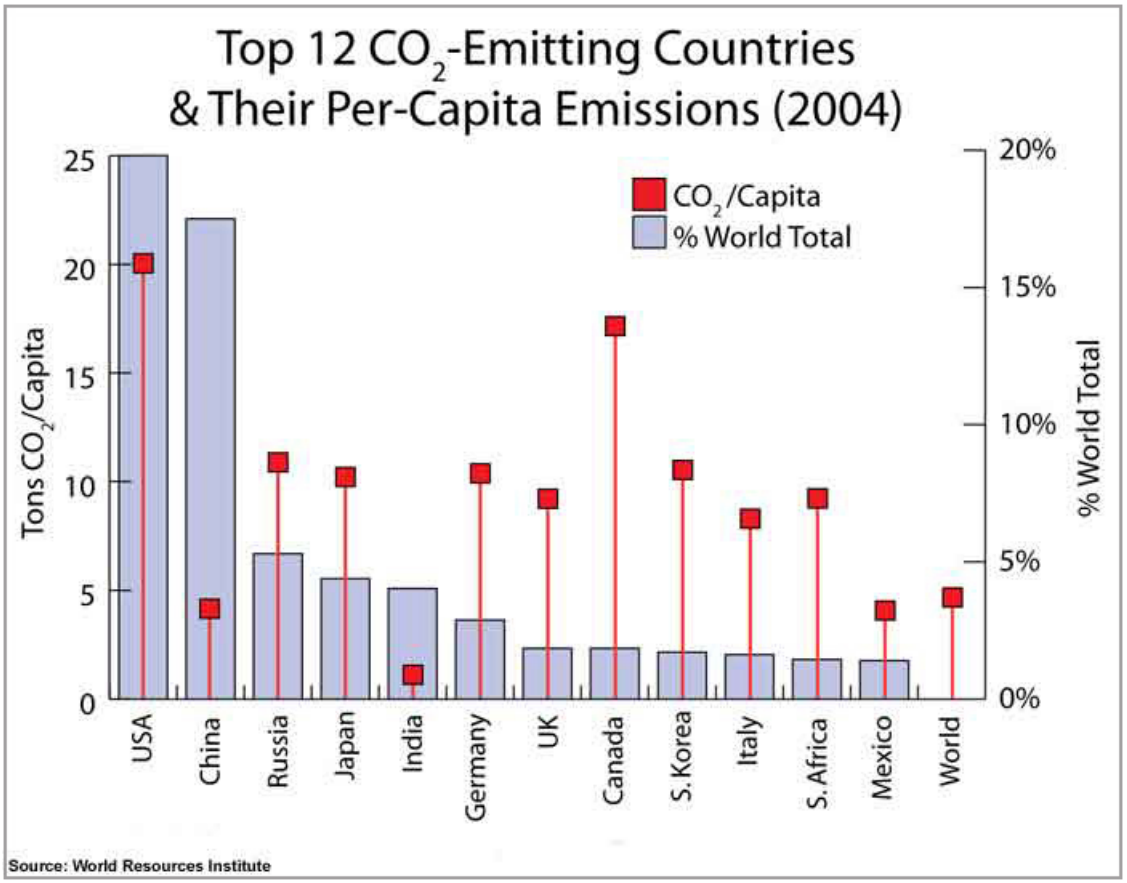


4.1. U.S. Position

Since 2007, the U.S. has been the second largest source of GHG emissions, only behind China, and accounted for approximately 16 per cent of the world's total emissions as of 2006.[174] However, per capita emissions remain extremely high in the U.S. with 18.376

[174] For a comparison of carbon dioxide emissions of the top-20 countries in the world in 2006 and a ranking of their per capita emissions, see Netherlands Environment Agency, http://www.pbl.nl/images/Top20-CO2andGHG-countries-in2006-2005(GB)_tcm61-36276.xls.

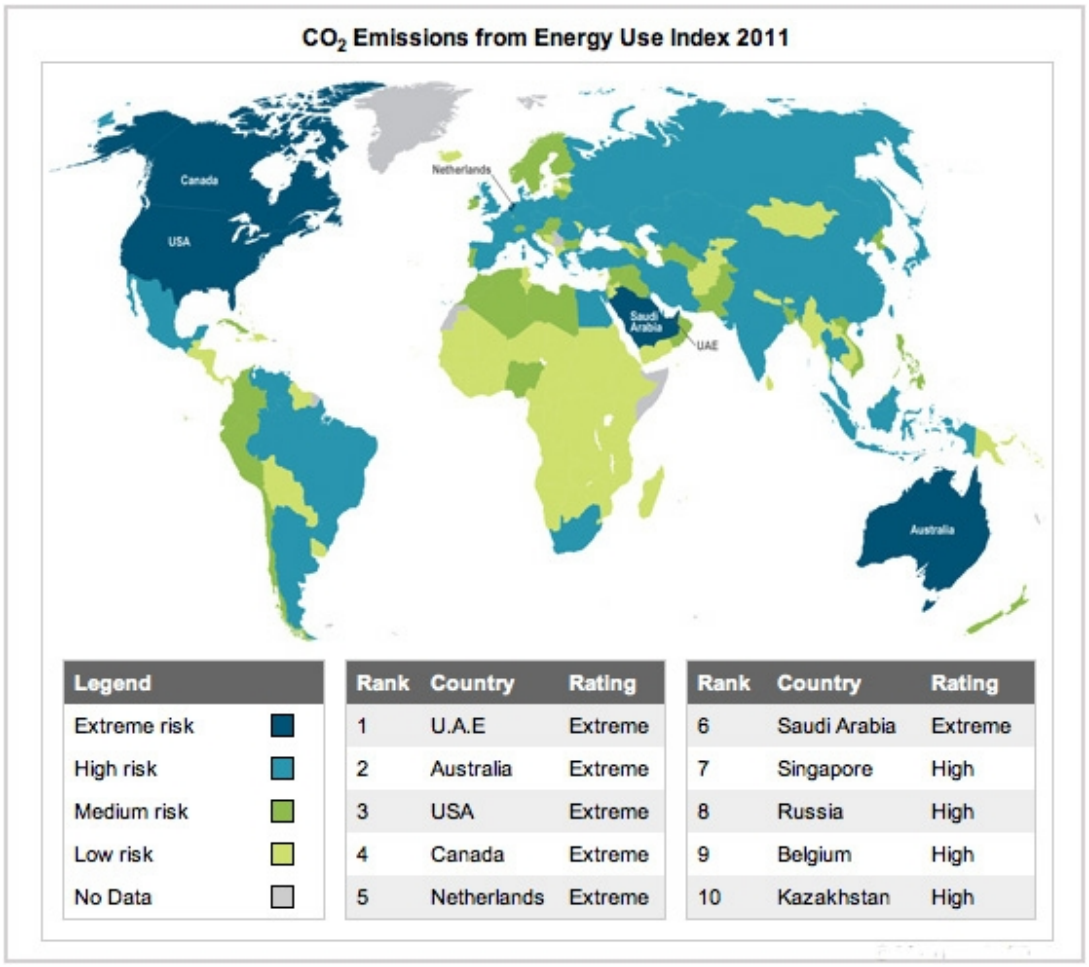
tons of GHG emissions per year[175] (compared to, for example, China with 4.916 tons of GHG emissions per year[176]) as of 2008. The chart below illustrates the top CO2-emitting countries and their per capita emissions as of 2004. One observes from the chart that per capita emissions in the U.S. remain, by far, ahead of China's.



Concerning cumulative CO2 emissions, the U.S. remains responsible for 30 per cent over the 1900-2005 period and the EU for 23 per cent, while China only counts for 8 per cent.[177] However, according to a high growth scenario over the period 2005-2030, the International Energy Agency predicts that the cumulative emissions for China since 1900

[175] International Energy Agency Statistics, *CO2 Emissions from Fuel Combustion: Highlights*, Paris: OECD/IEA, 2010, p. 98.
[176] Ibid. at p. 100.

will be the same as those of the EU.[178] The map below shows that the U.S. is one of the worst performers in the world based on its high CO2 emissions from energy use.



Legend
Extreme risk
High risk
Medium risk
Low risk
No Data

Rank	Country	Rating
1	U.A.E	Extreme
2	Australia	Extreme
3	USA	Extreme
4	Canada	Extreme
5	Netherlands	Extreme

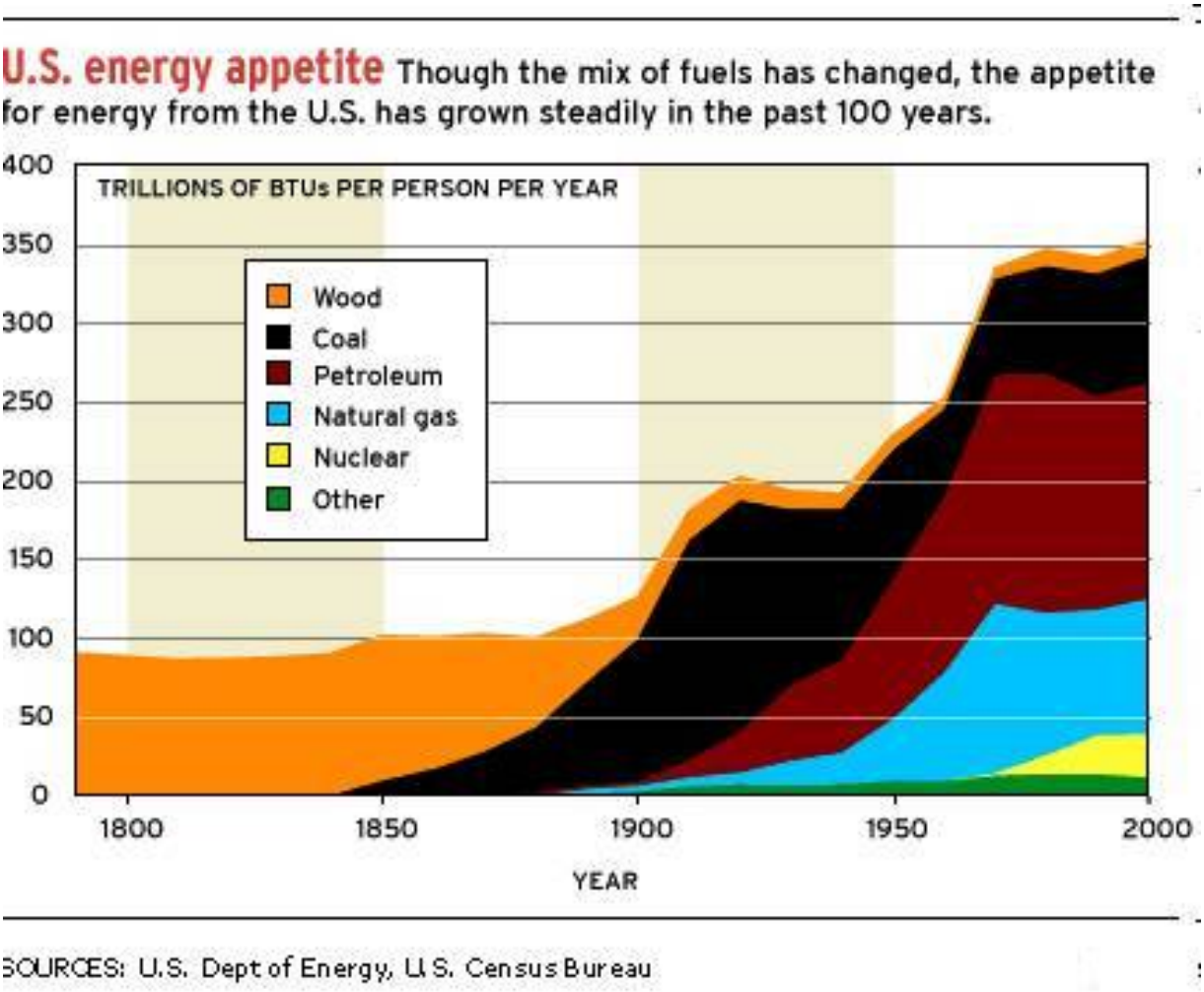
Rank	Country	Rating
6	Saudi Arabia	Extreme
7	Singapore	High
8	Russia	High
9	Belgium	High
10	Kazakhstan	High

Source: Maplecroft, 2010

The U.S. uses fossil fuels inefficiently, in part because it has the lowest fuel taxes in the industrialized world, but also because its oil and coal industries are politically

[177] International Energy Agency, *World Energy Outlook 2007—China and India Insights*, Paris: OECD/IEA, 2007, graph in p. 201.
[178] Ibid., p. 199.

influential. One may also note that former U.S. President G.W. Bush and Vice-President Cheney are both former oil men, who still have close ties to oil producing companies and regions.[179] President Obama, however, has proposed green energy tax incentives to encourage U.S. businesses to upgrade their commercial buildings and make them more efficient.[180] As the chart shows, the main sources of energy in the U.S. today are still oil, coal, and natural gas:



[179] Reno, R. "Bush, Cheney Are Oil Men and Oily Guys," *Newsday*, 21 September 2000, available at http://www.commondreams.org/views/092100-102.htm.
[180] Kirchgaessner, S. & Lemer, J. "Obama proposes 'green tax' incentives," *Financial Times.com*, 3 February 2011.

Although former U.S. President Clinton signed the Kyoto Protocol, former U.S. President G.W. Bush publicly expressed skepticism, arguing that the Kyoto Agreement, as negotiated by the Clinton administration, represented a "lousy deal"[181] for the American people in general, and the U.S. economy in particular, since the cost is too high. The G.W. Bush administration believed that the Kyoto Protocol would damage their industries. In fact, even if the G.W. Bush administration had made Kyoto its top priority,[182] it would have needed perhaps quite some time to craft and adopt implementing legislation and win a difficult battle to ratify the treaty.[183] This means that the U.S. Government would have had only a few years before the Kyoto Protocol's limits on GHG emissions had taken full effect.

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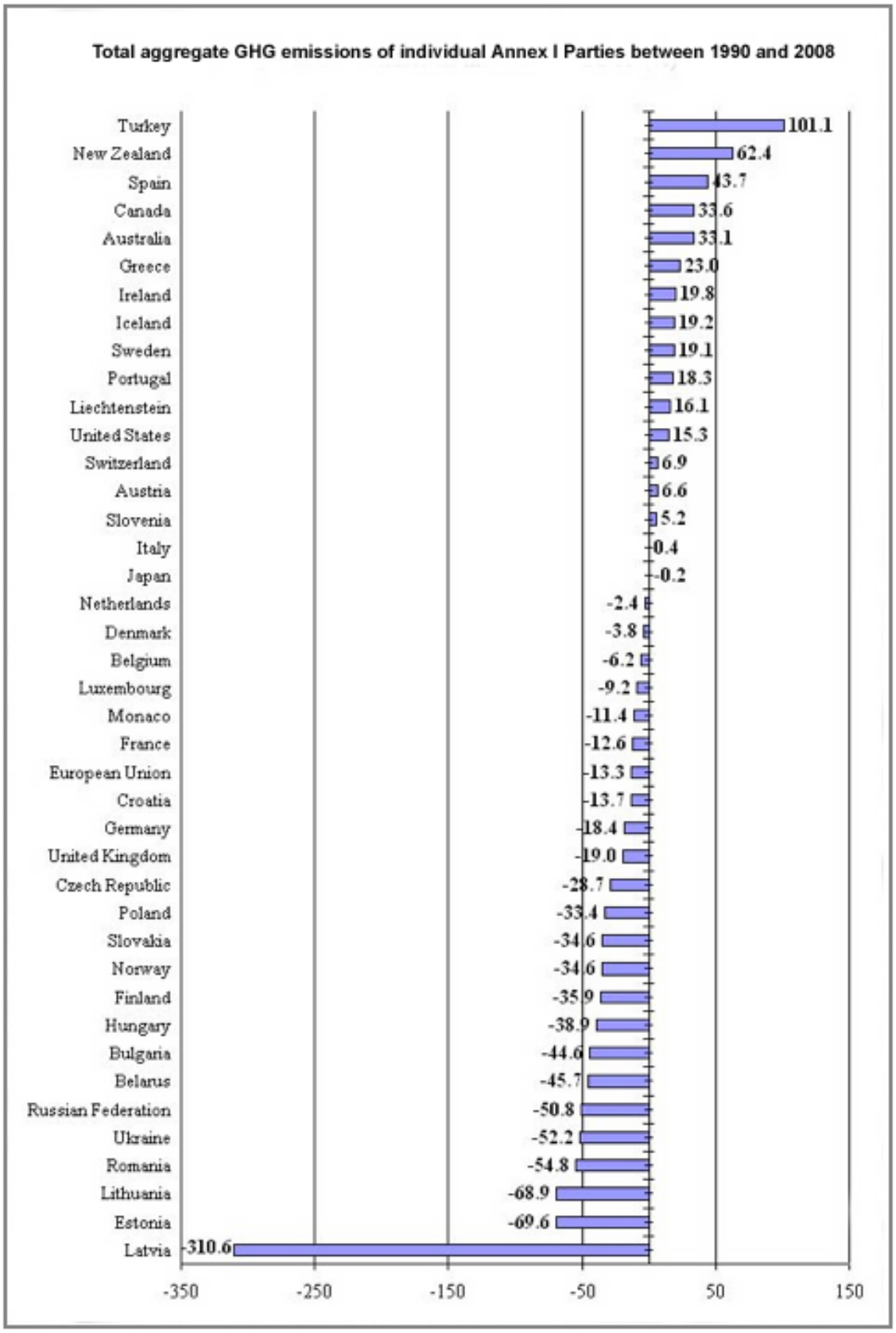
[181] Forbes, "Bush dubs Kyoto treaty 'lousy deal' for US economy," 7 April 2005, available at http://www.forbes.com/feeds/afx/2005/07/04/afx2122482.html.

[182] On U.S. climate change policy under President G.W. Bush, see Ackerman, S. "What Are Lobbyists Saying on Capitol Hill? Climate Change Legislation as a Case Study for Reform," 37 *Envtl. L.*, 137 (2007); Brittany H. "Is President Bush's Vision Impaired? An Analysis of President Bush's 'Climate VISION' Initiative," *19 J. Nat. Resources & Envtl. L.,* 59 (2004-2005); Carlarne, C. "Notes From a Climate Change Pressure-Cooker: Subfederal Attempts at Transformation Meet National Resistance in the USA," 40 *Conn. L. Rev.,* 1351 (2008); Cass, L. *The Failures of American and European Climate Policy: International Norms, Domestic Policies, and Unachievable Commitments,* State University of New York Press, 2006; Freeman, J. & Vermeule, A. "Massachusetts v. EPA: From Politics to Expertise," 2007 *Sup. Ct. Rev.*, 51; Harris, A. "Derogating the Precautionary Principle," 19 *Villanova Envtl. L.J.,* 1 (2008); Hobley, A. "Is Kyoto Dead? Climate Change after Bush," 10(5) *Envtl. Liability,* 167 (2002); Kammen, D. & Nemet, G. "Reversing the Incredible Shrinking Energy R&D Budget," *Issues in Science and Technology*, 84 (2005); Rabe, B. *Statehouse and Greenhouse: The Emerging Politics of American Climate Change Policy,* Brookings Institution Press, 2004; Rich, R. et al., "Use and Misuse of Science: Global Climate Change and the Bush Administration," 14(3) *Va. J. Soc. Pol'y & L.*, 223 (2007); Rosencranz, A. "U.S. Climate Change Policy under G. W. Bush," 32(4) *Golden Gate U. L. Rev.,* 479 (2002); Thackeray, R. "Struggling for Air: The Kyoto Protocol, Citizens' Suits Under the Clean Air Act, and the United States' Options for Addressing Global Climate Change," 14 *Ind. Int'l & Comp. L. Rev.,* 855 (2004); Thomas P. "The Evolution of State Climate Change Policy in the United States: Lessons Learned and New Directions," 14 *Widener L.J.*, 81 (2004); Thorson, E. "On Thin Ice: The Failure of the United States and the World Heritage Committee to Take Climate Change Mitigation Pursuant to the World Heritage Convention Seriously," 38 *Envtl. L.*, 139 (2008); Waterman, P. "From Kyoto to ANWR: Critiquing the Bush Administration's Withdrawal from the Kyoto Protocol to the Framework Convention on Climate Change," 13 *Transnat'l L. & Contemp. Probs.,* 749 (2003); Wolf, L. "Countervailing a Hidden Subsidy: The U.S. Failure to Require Greenhouse Gas Emission Reductions," 19 *Geo. Int'l Envtl. L. Rev.,* 83 (2006).

[183] For an analysis of the effects of incremental domestic legislation on international negotiations to limit greenhouse gas emissions, see Brewster, R. "Stepping Stone or Stumbling Block: Incrementalism in National Climate Change Legislation," *Yale Law and Policy Review*, Vol. 28, No. 2, 2010, pp. 245-312.

An interesting observation is that it was initially believed that if the U.S. stayed on its present track, by the time we got to the period 2008-2012, its GHG emissions would be perhaps 30 per cent higher than the 1990 levels. However, as can be seen in the chart below, the reality is that the U.S.'s actual CO2 emissions for the period 1990-2008 was 14.9 to 15.3 per cent higher than the 1990 levels, therefore lower than the expectation in the early 2000s.[184] This nevertheless is far from reaching the mere 5 per cent-below-1990-levels target required by Kyoto.[185] Also, according to the UNFCCC, big EU economies such as the UK and Germany spewed smaller amounts of GHG into the atmosphere in 2008 than they did in 1990. Some of the biggest reductions of GHG emissions over the period between 1990 and 2008 took place in former Soviet countries such as Ukraine, partly because their industries were very polluting before 1990.

[184] See IEA Statistics, "CO2 Emissions from Fuel Combustion: Highlights," p. 44, 2010, available at http://www.iea.org/co2highlights/.
[185] Article 3.1 of the Kyoto Protocol.


Total aggregate GHG emissions of individual Annex I Parties between 1990 and 2008
Turkey 101.1
New Zealand 62.4
Spain 43.7
Canada 33.6
Australia 33.1
Greece 23.0
Ireland 19.8
Iceland 19.2
Sweden 19.1
Portugal 18.3
Liechtenstein 16.1
United States 15.3
Switzerland 6.9
Austria 6.6
Slovenia 5.2
Italy -0.4
Japan -0.2
Netherlands -2.4
Denmark -3.8
Belgium -6.2
Luxembourg -9.2
Monaco -11.4
France -12.6
European Union -13.3
Croatia -13.7
Germany -18.4
United Kingdom -19.0
Czech Republic -28.7
Poland -33.4
Slovakia -34.6
Norway -34.6
Finland -35.9
Hungary -38.9
Bulgaria -44.6
Belarus -45.7
Russian Federation -50.8
Ukraine -52.2
Romania -54.8
Lithuania -68.9
Estonia -69.6
Latvia -310.6
-350
-250
-150
-50
50
150

Source: UNFCCC

In a weekly policy meeting, former Vice-President Cheney told a group of senators that the campaign pledge to control CO2 was "a mistake," and that the administration was preparing a letter that would say CO2 was not a pollutant.[186] G.W. Bush's opposition to climate control mechanisms and to the Kyoto Protocol was crystal clear in 2001: "As you know, I oppose the Kyoto Protocol because it exempts 80 percent of the world, including major population centers such as China and India, from compliance, and would cause serious harm to the U.S. economy. The Senate's vote, 95-0, shows that there is a clear consensus that the Kyoto Protocol is an unfair and ineffective means of addressing global climate change concerns. As you also know, I support a comprehensive and balanced national energy policy that takes into account the importance of improving air quality. Consistent with this balanced approach, I intend to work with the Congress on a multi-pollutant strategy to require power plants to reduce emissions of sulfur dioxide, nitrogen oxides, and mercury. Any such strategy would include phasing in reductions over a reasonable period of time, providing regulatory certainty, and offering market-based incentives to help industry meet the targets. I do not believe, however, that the government should impose on power plants mandatory emissions reductions for carbon dioxide, which is not a "pollutant" under the Clean Air Act."[187]

[186] See Office of the Press, "Text of a Letter from the President to Senators Hagel, Helms, Craig, and Roberts," *The White House*, which is a response letter dated 13 March 2001 from the U.S. President to Senators Hagel, Helms, Craig, and Roberts to their letter of 6 March 2001, asking for the Administration's views on global climate change, in particular the Kyoto Protocol, and efforts to regulate carbon dioxide under the Clean Air Act. Available at http://www.gcrio.org/OnLnDoc/pdf/bush_letter010313.pdf.
[187] Ibid.

In his opposition to the Kyoto Protocol, President G.W. Bush also referred to "the incomplete state of scientific knowledge of the causes of, and solutions to, global climate change…"[188] In the U.S. there has been vigorous debate on the reliability of climate change science, with some commentators accusing the IPCC of political bias. However, at the initiative of the Royal Society, a group of 16 national academies of science from all parts of the world agreed to a statement in the U.S. journal *Science*, saying that they recognized the IPCC as "the world's most reliable source of information on climate change."[189] In the same statement in *Science*, the academies criticized skeptics who question the need to mitigate climate change risks. "We do not consider such doubts justified,"[190] says the statement. The statement was signed by the scientific academies of Australia, Belgium, Brazil, Canada, the Caribbean, China, France, Germany, India, Indonesia, Ireland, Italy, Malaysia, New Zealand, Sweden, and the United Kingdom. Other members of the G.W. Bush administration have publicly shown their lack of interest in the Kyoto Treaty: "no, we have no interest in implementing that [Kyoto] treaty."[191]

In the 2000 presidential campaign, there was a division of position regarding the environment. Democrats believed that tackling global warming was not costly, while Republicans believed it would be enormously costly. For example, the G.W. Bush administration argued that "in ruling out a plan to impose restrictions on power plants' emissions of carbon dioxide, […] it is said such a step would be too costly to the

[188] Ibid.
[189] The Royal Society, "The Science of Climate Change," available at http://royalsociety.org/Report_WF.aspx?pageid=10028.
[190] Ibid.

economy and to American consumers."[192] Therefore, on the American side, there was a strong reluctance to impose rapid and severe cuts on energy consumption, especially by individual consumers.[193]

During the 2000 campaign, Bush showed some interest in the environment, but most likely only in order to gain votes. Once in office, Bush publicly mentioned that his campaign proposal had been in error, since CO2 was not a "pollutant"[194] according to the 1970 Clean Air Act.[195] He also referred to a December 2000 study by the Department of Energy, which, in his words, concluded that "caps on carbon dioxide emissions as part of a multiple emissions strategy would lead to an even more dramatic shift from coal to natural gas for electric power generation and significantly higher electricity prices."[196] These caps were a concern, he wrote, particularly in the West [of the U.S.]: "At a time when California has already experienced energy shortages, and other Western states are worried about price and availability of energy this summer, we must be very careful not to take actions that could harm consumers."[197] Yet, as Elizabeth Shogren of the *Los Angeles Times* immediately pointed out, California is "much less dependent on coal for

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[191] Christine Todd Whitman, administrator of the Environmental Protection Agency, discussing the U.S. Administration's decision to reject the Kyoto Treaty, in *Europe*, Europe Update, April 2001, Volume IX, Number 4.
[192] See Jehl, D., "U.S. Rebuffs European Plea Not to Abandon Climate Pact" *The New York Times*, April 4, 2001, p. A 16.
[193] Anderson, J.W., "Climate Change Diplomacy: The Next Step," in *Resources*, Winter 2001, Issue Number 142, pp. 11-13, at 11.
[194] Others share President G.W. Bush's view that CO2 is not a pollutant, but a necessity. See "Carbon Dioxide is Our Friend," available at http://www.youtube.com/watch?v=0_VmMIbWKoo; see also "Global Warming – 'Glaciers," available at http://www.youtube.com/watch?v=Wq_Bj-av3g0.
[195] U.S. Code, Title 42, Chapter 85.
[196] See Office of the Press, "Text of a Letter from the President to Senators Hagel, Helms, Craig, and Roberts," *The White House*, which is a response letter dated 13 March 2001 from the U.S. President to Senators Hagel, Helms, Craig, and Roberts to their letter of 6 March 2001, asking for the Administration's views on global climate change, in particular the Kyoto Protocol, and efforts to regulate carbon dioxide under the Clean Air Act.
[197] Ibid.

power than most of the country,"[198] with only about one-eighth of its power coming from coal-fired plants. Moreover, in a *New York Times* article published on April 4, 2001, it was noted that U.S. administration officials had restated "a view that the 1997 treaty was unfair to the United States and that it was not worthy of American support."[199]

4.1.1. Arguments for Rejecting Kyoto

In 1997 the U.S. Senate approved by a vote of 95-0 the Byrd-Hagel resolution,[200] which urged the administration not to agree to a treaty that: 1) does not include developing countries (especially China) and 2) harms the U.S. economy.[201] Since according to the U.S. Constitution, two thirds of the U.S. Senate (i.e., 67 votes) are needed for the ratification of a treaty,[202] Kyoto's ratification by the U.S. is far from becoming a reality. For years after the Byrd-Hagel resolution, President Clinton would frequently say: "Kyoto was the only bill I lost before I sent it to the Congress."[203]

On what grounds was the U.S. Senate arguing, and continues to argue, the first point (i.e., not to agree to a climate change treaty that does not include developing countries)? According to the Netherlands Environmental Assessment Agency, since 2007

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[198] Shogren, E. "Bush Drops Pledge to Curb Emissions," *Los Angeles Times*, 14 March 2001, available at http://articles.latimes.com/2001/mar/14/news/mn-37556.
[199] See Jehl, D., "U.S. Rebuffs European Plea Not to Abandon Climate Pact" *The New York Times*, April 4, 2001, p. A 16.
[200] S. Res. 98, 105th Congress, 1997.
[201] See Cohen, B. R., "Next Round in the Climate Debate," in *The Earth Times*, October 30, 2000, pp. 10-15, at. 14.
[202] Article II, Section 2, of the U.S. Constitution.
[203] On U.S. climate change policy under President Clinton, see McGee, J. & Taplin, R. "The Asia-Pacific Partnership and the United States' International Climate Change Policy," 19 *Colo. J. Int'l Envtl. L. & Pol'y,* 179 (2008); Peterson, T. "The Evolution of State Climate Change Policy in the United States: Lessons Learned and New Directions," 14 *Widener L.J.,* 81 (2004); Royden, A. "U.S. Climate Change Policy Under President Clinton: A Look Back," 32 *Golden Gate U. L. Rev.,* 415 (2002); Thackeray, R. "Struggling for Air: The Kyoto Protocol, Citizens' Suits Under the Clean Air Act, and the United States' Options for Addressing Global Climate Change," 14 *Ind. Int'l & Comp. L. Rev.,* 855 (2004).

China has been the largest producer of CO_2 in the world.[204] Since global warming is a long-term problem, China has to commit. Under the Kyoto Protocol, developing countries have no binding obligation, giving them a competitive advantage in marketing any product where energy costs are a key aspect to its manufacture. The U.S. Senate would ultimately reject any climate change treaty that does not include meaningful participation by developing countries.

Since the 2009 COP-15 in Copenhagen resulted in an Accord which resembles a pledge-and-review system, most observers now doubt that a framework built on emissions targets and timetables, as is the case of the Kyoto Protocol, is politically viable at all in the foreseeable future. A key issue is whether a pledge-and-review system suffices, at least for the time being. Will progress on the numbers (i.e., GHG emission rates or emission intensity) actually occur? If not, what other approach is feasible now or in the foreseeable future?

The climate change problem cannot be solved without developing country participation, but the industrialized countries have greater resources than most developing countries when it comes to tackling climate change. In the view of many people, as the biggest GHG polluters to date, the developed countries also have a moral obligation to act first. However, China is the major GHG emitting country since 2007, so its position as leader of a historically hurt G-77 is no longer credible.

As for the second point (i.e., not to agree to a climate change treaty that harms the U.S. economy), the G.W. Bush administration argued that the overall cost of the Kyoto Protocol to the U.S. economy would simply be too high. Moreover, West Virginia,

[204] Netherlands Environmental Assessment Agency, "Global CO2 emissions: increase continued in 2007,"

among other states, opposed the ratification of the Kyoto Protocol because West Virginia mainly produces coal. The same argument is used by Saudi Arabia and other Persian Gulf countries which are heavily reliant on the oil industry. Consumption of both coal and oil produces CO2. Incidentally, Saudi Arabia is the only country to openly doubt the reality of human-caused climate change. Instead of ratification, G.W. Bush's national policy was to slightly slow the growth of GHG emissions by encouraging voluntary efficiency improvements by individuals and industries. It has also supported subsidies and cooperative agreements for development of new low-carbon technologies. At other times, the G.W. Bush administration proposed adaptation as the only sensible climate policy. It is somewhat ironic that the Bush policy actually worked, not on its own, but because of the unanticipated steep rise in energy prices after 2001. The 2008 economic collapse further suppressed emissions.

Even under Barack Obama's administration, the U.S. seems far from being committed to the Kyoto Protocol.[205] Although at first it seemed that the Obama administration was committed to, and displayed great enthusiasm for, the global negotiations on climate change,[206] there is not much difference with G.W. Bush's

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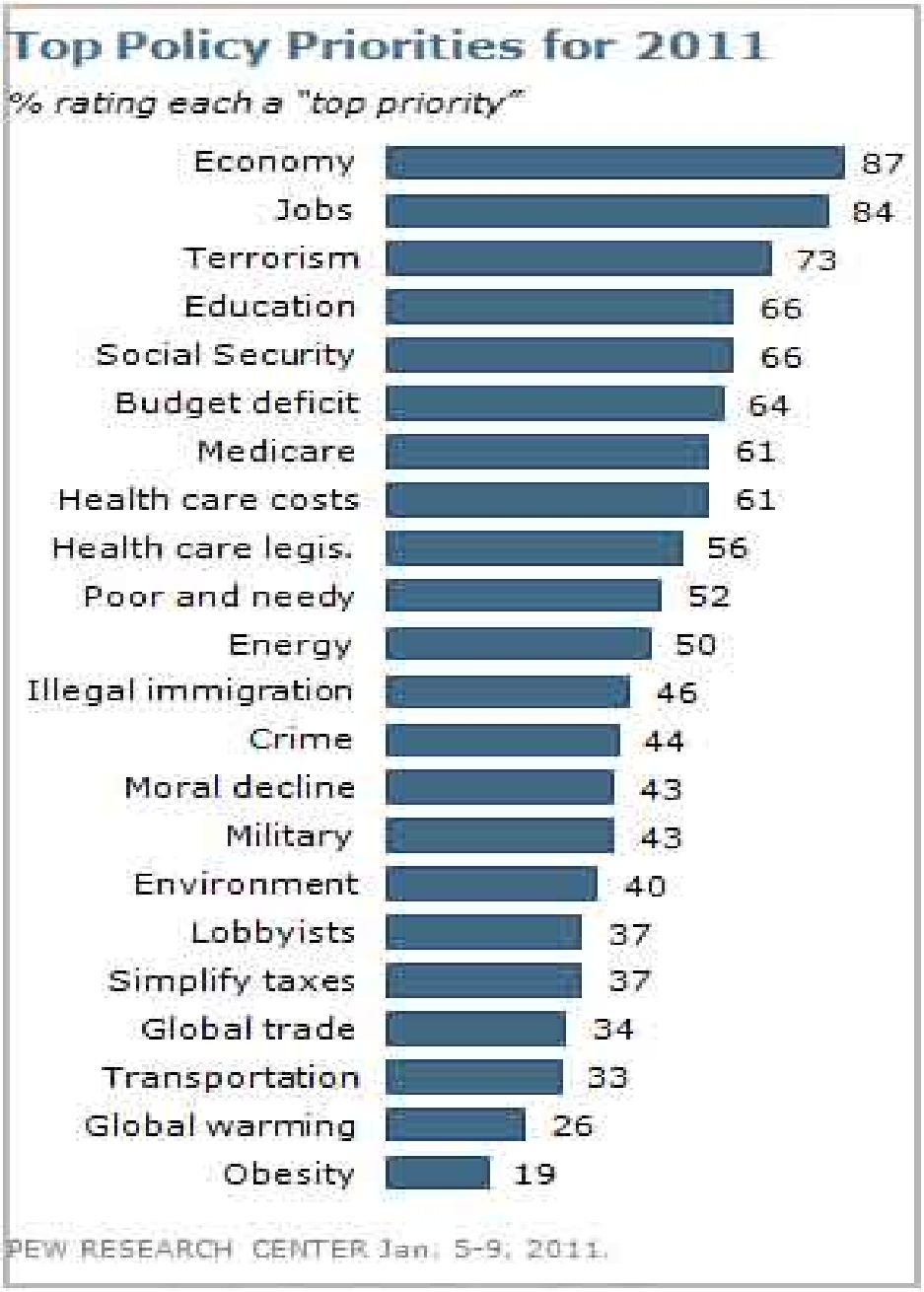
13 June 2008, available at http://www.pbl.nl/en/publications/2008/GlobalCO2emissionsthrough2007.html.

[205] For an analysis of U.S. climate policy under President Obama, see Adams M. *Working With Government Agencies In Climate Change Law,* Aspatore, 2009; Battista, G. "The Obama Climate Change and Energy Agenda: Bad Timing for a Renaissance," 16(5) *Envtl. Liability,* 167 (2002); Camacho, A. "Adapting Governance to Climate Change: Managing Uncertainty Through a Learning Infrastructure," 59 *Emory L.J.,* 1 (2009); Hunter, D. "International Climate Negotiations: Opportunities And Challenges For The Obama Administration*",* 19 *Duke Envtl. L. & Pol'y F.,* 247 (2009); Martella, R. "Climate Change Along the Northeast Corridor: How Washington and New York are Approaching and Preparing for Greenhouse Gas Controls," 18 *N.Y.U. Envtl. L.J.,* 14 (2010); Miller, N. et al. "Policy, Urban Form, and Tools for Measuring and Managing Greenhouse Gas Emissions: The North American Problem," 80 *U. Colo. L. Rev.*, 977 (2009); Westmoreland, J. "Global Warming and Originalism: The Role of the EPA in the Obama Administration," 37 *EB.C. Envtl. Aff. L. Rev.*, 225 (2010).

[206] See the views of President Obama at a primary-campaign victory speech in St. Paul, Minnesota, in favour of climate change. Lizza, R. "As the World Burns: How the Senate and the White House missed their best chance to deal with climate change," *The New Yorker*, 11 October 2010.

administration.[207] Political developments in the U.S. have disillusioned this ambition. For example, Congressional proposals for a domestic cap-and-trade regime for emissions limitations have failed. It is also interesting to note that, in May 1998, the Illinois General Assembly passed a bill condemning the Kyoto Protocol and forbidding state efforts to regulate greenhouse gases. The then state legislator Barack Obama voted for the bill.[208] That said, it was just a resolution, so even though it passed, it had no legal effect. The chart below shows the fact that climate change was not a top policy priority for the Obama administration in 2011:

[207] Thernstrom, S. "The Quiet Death of the Kyoto Protocol," *The American*, 5 November 2009, available at http://www.american.com/archive/2009/november/the-quiet-yet-historic-death-of-the-kyoto-protoco.
[208] Ninetieth General Assembly of the State of Illinois, House Joint Resolution No. 48, 22 May 1998, p. 4313.



In fact, dealing with global warming as a top priority for the U.S. President and Congress has been getting worse over the years since 2007, as the next chart clearly illustrates:

Public's Agenda for President and Congress 2001-2011

% considering each as a "top priority"	Jan 2001 %	Jan 2002 %	Jan 2003 %	Jan 2004 %	Jan 2005 %	Jan 2006 %	Jan 2007 %	Jan 2008 %	Jan 2009 %	Jan 2010 %	Jan 2011 %	10-11 change
Strengthening nation's economy	81	71	73	79	75	66	68	75	85	83	87	+4
Improving the job situation	60	67	62	67	68	65	57	61	82	81	84	+3
Defending against terrorism	--	83	81	78	75	80	80	74	76	80	73	-7
Improving education	78	66	62	71	70	67	69	66	61	65	66	+1
Securing Social Security	74	62	59	65	70	64	64	64	63	66	66	0
Reducing budget deficit	--	35	40	51	56	55	53	58	53	60	64	+4
Securing Medicare	71	55	56	62	67	62	63	60	60	63	61	-2
Reducing health care costs	--	--	--	--	--	--	68	69	59	57	61	+4
Revising health care legislation	--	--	--	--	--	--	--	--	--	--	56	--
Dealing with problems of the poor and needy	63	44	48	50	59	55	55	51	50	53	52	-1
Dealing with nation's energy problem	--	42	40	46	47	58	57	59	60	49	50	+1
Dealing with illegal immigration	--	--	--	--	--	--	55	51	41	40	46	+6
Reducing crime	76	53	47	53	53	62	62	54	46	49	44	-5
Dealing with moral breakdown in country	51	45	39	45	41	47	47	43	45	45	43	-2
Strengthening the military	48	52	48	48	52	42	46	42	44	49	43	-6
Protecting environment	63	44	39	49	49	57	57	56	41	44	40	-4
Reducing influence of lobbyists	--	--	--	--	--	--	35	39	36	36	37	+1
Simplifying tax system	--	--	--	--	39	40	--	--	--	--	37	--
Dealing with global trade	37	25	--	32	32	30	34	37	31	32	34	+2
Improving roads, bridges, and public transportation	--	--	--	--	--	--	--	--	--	--	33	--
Dealing with global warming	--	--	--	--	--	--	38	35	30	28	26	-2
Dealing w/ obesity	--	--	--	--	--	--	--	--	--	--	19	--

PEW RESEARCH CENTER Jan. 5-9, 2011. Q26.

To that can be added that, since 2008, Americans seem to be less worried about the threat of global warming, less convinced that its effects are already happening, and

are less sure that scientists themselves are certain about its occurrence.[209] Even some U.S. policymakers deny that global warming is anthropogenic.[210]

If our aim is to move the world economy entirely away from fossil fuels, we would need to increase funding for research to find alternatives. Until we get there, we can gradually raise the efficiency of fossil-fuel consumption. The problem is that most of the technologies that use fossil fuels are long-lived (for example, the stock of automobiles has a lifetime of about two decades). This implies that even with clear policy signals to control emissions, manufacturers and consumers have only limited leverage over emissions in the short term. The U.S. Climate Change Adaptation Task Force released an interagency report in October 2010 outlining recommendations to President Obama for how federal agency policies and programs can better prepare the U.S. to respond to the impacts of climate change.[211]

4.1.2. What Should the U.S. be Aiming at?

The U.S. has long insisted that the most cost-effective way to reduce global emissions of greenhouse gases is through an international regime of emissions trading.[212] The Clinton administration had already said that it wanted explicit rules on international trading of emissions permits before ratifying the Kyoto Protocol, but the trading rules remain

[209] Newport, F. "Americans' Global Warming Concerns Continue to Drop," *Gallup*, 11 March 2010, available at http://www.gallup.com/poll/126560/americans-global-warming-concerns-continue-drop.aspx.
[210] CBSNews, "New House Energy Chair: Global Warming Not Man-Made," 9 February 2011, available at http://www.cbsnews.com/8301-501465_162-20031180-501465.html.
[211] The White House Council on Environmental Quality, "Progress Report of the Interagency Climate Change Adaptation Task Force: Recommended Actions in Support of a National Climate Change Adaptation Strategy," 5 October 2010.
[212] For views of the U.S. government energy and climate change programs, see Brewer, T. "U.S. Government Policymaking on Climate Change: Recent Developments, Transitions, and Prospects for the Future," *Oxford Energy and Environment Comment*, October 2010; Eizenstat, S. "The U.S. Role in Solving

unclear.[213] Since Kyoto stipulates that emissions trading will be limited only to Annex I countries,[214] the U.S. should try to renegotiate this limitation to expand it to trading emissions with developing countries.[215]

The U.S. (and other developed regions of the world for this matter) should be willing to cooperate in technology transfer for the benefit of the environment globally. In fact, the U.S. assumption during the Kyoto negotiations was that technology transfer from developed to developing countries could solve global warming and would also help the U.S. have a greater market access to developing countries. As shown in the chart below, the contribution to GHG increase by 2025 coming from industrialized countries will be relatively modest, compared to that projected in developing countries. If we believe that in years to come developing countries will be causing greater environmental damage than the developed world,[216] then this argument of environmental technology transfer makes perfect sense. While at a global level, it would be unfair to place the same burden on developing countries as on developed countries, they must at least make a minimum of contribution.

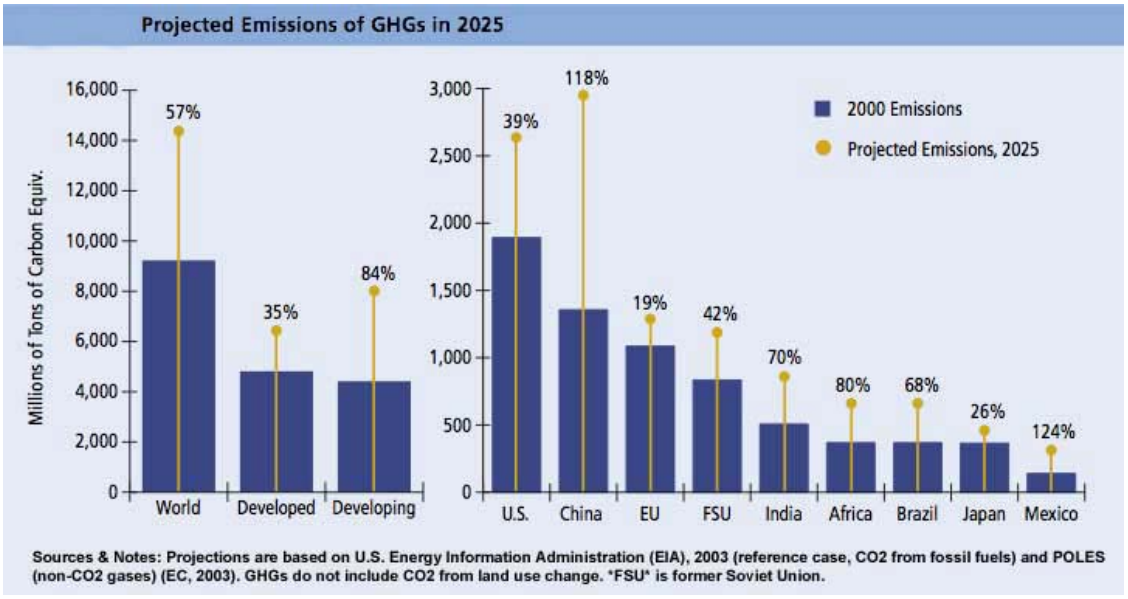
Climate Change: Green Growth Policies Can Enable Leadership Despite the Economic Downturn," *Energy Law Journal*, Vol. 30, No. 1, 2009, pp. 1-9.

[213] Anderson, J.W., "Climate Change Diplomacy: The Next Step," in *Resources*, Winter 2001, Issue Number 142, pp. 11-13, at 12.

[214] Annex I of the UNFCCC refers to developed countries and countries that are undergoing the process of transition to a market economy.

[215] Article 3 of the Kyoto Protocol.

[216] Indeed, since 2007 China is the largest emitter of CO2 in the world. It is predicted that other major developing countries will increase their GHG emissions in the near future.



All this said, two steps need to be distinguished. First, U.S. environmental policy is still hindered by the important economic consequences at stake. The U.S. administration cannot ignore the economic interests linked to the soundness of the oil market, major firms rely on it, and a slowdown in their activity could hinder the U.S. economic growth.[217] It makes it extremely difficult to pass an environmental bill through Congress. Second, the non-binding Copenhagen Accord, wished by the American President, acts as a compromise between flexibility ordered by the industry and the politically incorrect refusal of environmental policy changes.

On the domestic U.S. front, the Obama administration seems committed to implementing regulations on large GHG sources through its Clean Air Act authority (although how far it can go without causing a Congressional backlash is unclear), and it

[217] In his book *America's Climate Problem*, Robert Repetto proposes a national policy for the U.S. that can reduce GHG emissions and can bring about a transition to clean energy sources, while preserving healthy economic growth and high standards of living. Repetto addresses the controversial issue of fundraising as a root cause of the U.S. Congress's failure to enact policies that set a price on carbon—even when the EU, Japan, Australia, New Zealand, several Canadian provinces, and even many U.S. State governments have done so. See Repetto, R. *America's Climate Problem: The Way Forward*, London: Earthscan, 2011.

has already tightened fuel economy standards across the motor vehicle fleet at the federal level. At the state and local level, greenhouse reduction plans are being implemented to cap or reduce emissions. In California, implementation of recent legislation to reduce GHG emissions from motor vehicles and other sources is providing a test case of the legal and political ability of states moving ahead without the federal government. Success in California would provide some impetus to federal legislation (assuming costs of implementation are modest) as other states perhaps may do the same and the industry may look to U.S. Congress for national uniformity. Previous examples of legislative success at the state level, which eventually turned into federal legislation, are urban air pollution, leading to the federal Clean Air Act of 1970, and acid rain, leading to the 1990 amendments.[218]

Several large companies such as General Electric and British Petroleum have made specific commitments over time to cut emissions in a way roughly consistent with the Kyoto obligations. For the first time, in 2010 several large firms publicly endorsed an emission cap via the United States Climate Action Partnership.[219] One reason was their anticipation of ultimate CO2 regulation and the competitive advantage that may reside in making appropriate investment decisions well in advance. Another was the opportunity to coordinate international operations because some companies will come under Kyoto's strictures through their foreign operations and will be participating in Kyoto's emissions

[218] Section 812 of the 1990 Clean Air Act Amendments requires the U.S. Environmental Protection Agency to develop periodic reports that estimate the benefits and costs of the Clean Air Act. For a cost-benefit analysis on the Clean Air Act between 1990 and 2020, see U.S. Environmental Protection Agency, Office of Air and Radiation, "The Benefits and Costs of the Clean Air Act from 1990 to 2020," March 2011.

[219] The "United States Climate Action Partnership (USCAP) is a group of business and leading environmental organizations that have come together to call on the federal government to quickly enact strong national legislation to require significant reductions of greenhouse gas emissions." For further information, see http://www.us-cap.org/.

trading market. A third reason was green image-making with the public. These motivations remain in place.

4.1.3. Consequences of the U.S. Position for Foreign Affairs

The current situation is making the Trans-Atlantic relationship difficult. The issue of climate change has become a foreign policy problem for the U.S. The G.W. Bush administration gradually understood that "this is about international relations as well, and other countries are reacting very strongly against the U.S."[220]

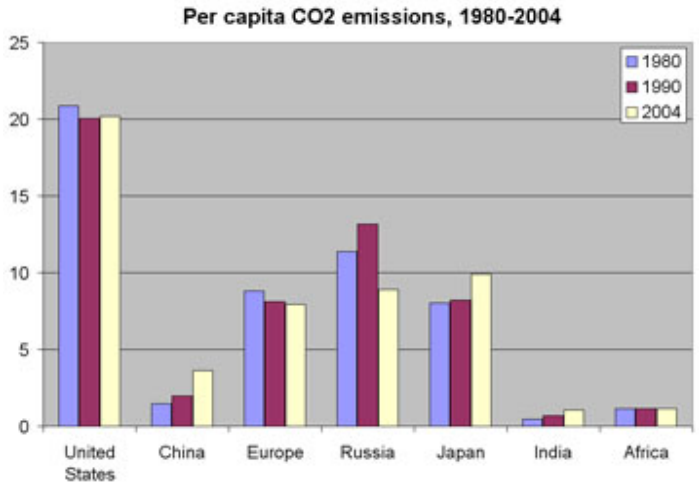
4.2. Chinese Position

Climate change will have a significant impact on China.[221] The size and rate of growth of China's economy, of its energy demand, of its energy imports, and of its atmospheric emissions of various types make this country an essential major partner in any regional or global discussions relating to climate change or the production and consumption of

[220] Anderson, J.W., "Climate Change Diplomacy: The Next Step," in *Resources*, Winter 2001, Issue Number 142, pp. 11-13, at 12.

[221] On the impact of climate change on China, see Gang, F. et al. (eds.), *The Economics of Climate Change in China: Towards a Low Carbon Economy*, Earthscan 2010; Jiang, N. & Chua, J. "Clean Development Mechanism in China," 21 *J. Int'l Bank. L. & Reg.*, 569 (2006); Jie, Y. "Greenhouse Gas Emissions and Mitigation Measures in China," in Stewart, R. et al. (eds.), *Climate Finance: Regulatory and Funding Strategies for Climate Change and Global Development*, NYU Press, 2009; Khoday, K. "Mobilizing Market Forces to Combat Global Environmental Change: Lessons from UN-Private Sector Partnerships in China," 16(2) *Rev. Euro. Comm. & Int'l Envtl. L.*, 173 (2007); Kim, M. & Jones, R. "China's Energy Security and the Climate Change Conundrum," 19(3) *Nat. Resources & Envt.,* 3 (2005); Kim, M. & Jones, R. "China: Climate Change Superpower and the Clean Technology Revolution," 22(3) *Nat. Resources & Envt.*, 9 (2008); McGee, J. &Taplin, R. "The Asia-Pacific Partnership And The United States' International Climate Change Policy," 19 *Colo. J. Int'l Envtl. L. & Pol'y*, 179 (2008); Sunstein, C. "The World vs. the United States and China? The Complex Climate Change Incentives of the Leading Greenhouse Gas Emitters," 55 *UCLA L. Rev.*, 1675 (2008); Vandenbergh, M. "Climate Change: The China Problem," 81 *S. Cal. L. Rev.*, 905 (2008); Wiener, J. "Climate Change Policy and Policy Change in China," 55 *UCLA L. Rev.,* 1805 (2008); Zang, D. "From Environment to Energy: China's Reconceptualization of Climate Change," 27 *Wis. Int'l L.J.,* 483 (2009); Zang, D. "Green from Above: Climate Change, New Developmental Strategy, and Regulatory Choice in China," 45 *Tex. Int'l L.J.,* 201 (2009).

energy.[222] China, a natural leader among developing countries, puts forward its counter-argument to the U.S. position, that is, that even if it is the largest producer of GHG emissions in cumulative terms since 2007, its per capita GHG emissions were only about 25 per cent of U.S. levels as of 2006[223] (see chart below regarding per capita CO2 emissions). Notwithstanding this, China is recently questioning statistics published by the International Energy Agency, which is especially shocking given the unreliability of many of the statistical indicators published by the Chinese government.[224]

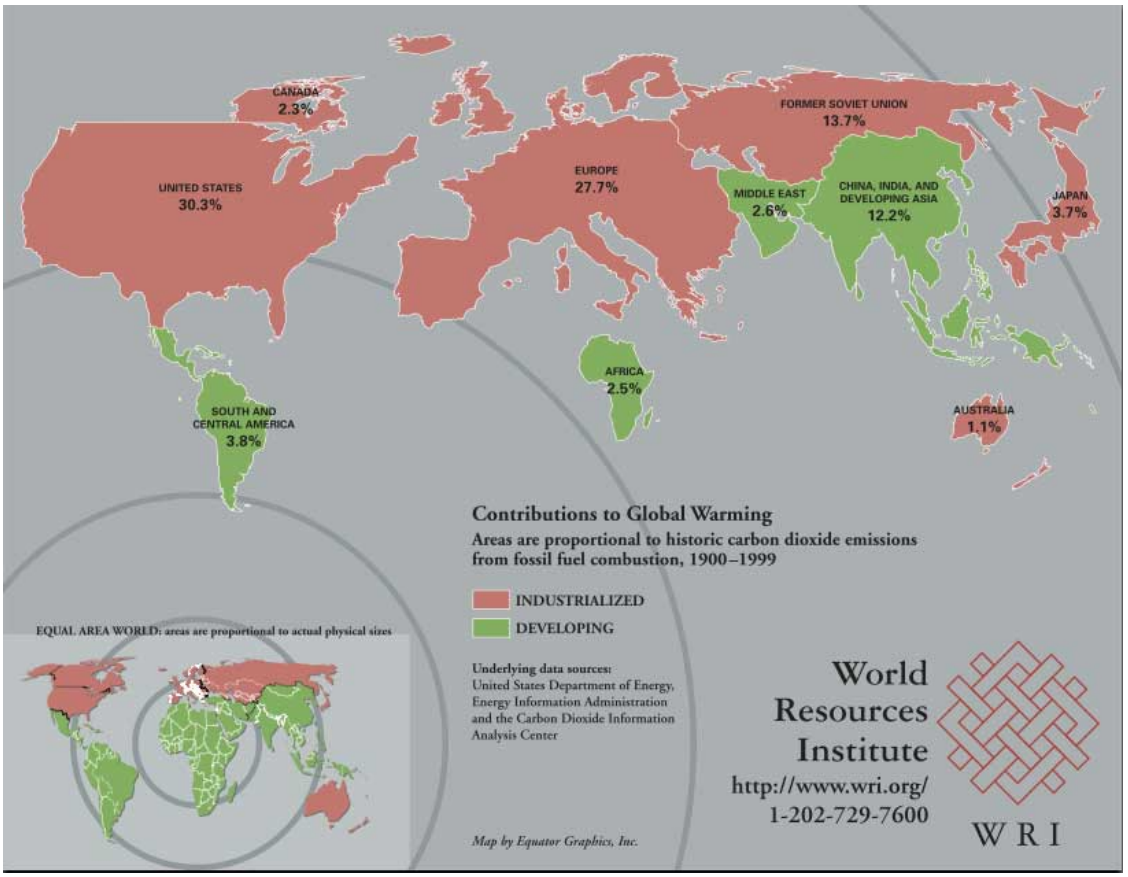


Source: Mongabay.com

China's position, therefore, is that global climate change must be addressed principally by wealthy industrial nations, which have not only the wealth and technology to provide solutions, but also the moral responsibility to do so because they have produced perhaps as much as 80 per cent of the GHG emissions to date, as shown in the

[222] Hallding, K. & Olsson, M. "Balancing climate concerns and energy security: China searching for a new development pathway," *Stockholm Environment Institute Policy Brief*, 2010.
[223] For an overview of carbon dioxide (i.e., the main greenhouse gas) emissions of the top-20 countries in the world in 2006, see Netherlands Environment Agency, http://www.pbl.nl/images/Top20-CO2andGHG-countries-in2006-2005(GB)_tcm61-36276.xls.
[224] http://www.e360.yale.edu/content/digest.msp?id=2511.

chart below.[225] China's refusal to agree to an internationally binding emissions target is commonly cited in the U.S. as an argument against U.S. legislative action.



Source: World Resources Institute

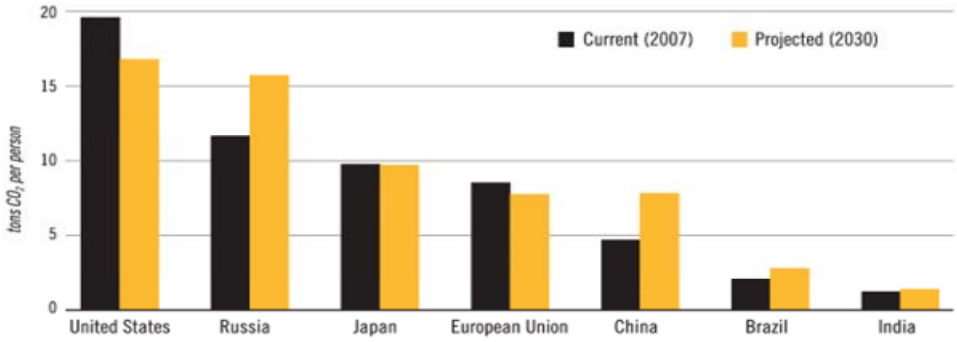
If the Kyoto commitment is not enough to solve the problem, developed countries should do more about GHG emission reductions before they ask developing nations for commitment. Large developing countries—such as China, India, and Brazil—will not commit internationally to material reductions in their emissions in the absence of some comparable commitment by, say, the U.S. Conversely, the U.S. has not participated in the Kyoto Protocol, and will not agree to mandatory emission reductions targets due to

[225] For a comparison of carbon dioxide emissions of the top-20 countries in the world in 2006 and a ranking of their per capita emissions, see Netherlands Environment Agency, http://www.pbl.nl/images/Top20-

concerns about a loss of competitive advantage, relative to developing countries that are not subject to the same obligations.

This is a circular argument: what comes first, the chicken or the egg? The U.S. is not willing to ratify an international multilateral environmental agreement on GHG emission reduction unless and until developing countries (especially China) are on board. On the other hand, China will only agree to being on board if the U.S. complies with the Kyoto Protocol first.[226] As can be seen in the chart below, the Chinese argument seems pertinent in view of the projected per capita CO2 emissions for major emitters by 2030:

Per Capita CO2 Emissions For Select Major Emitters, 2007 and 2030 (Projected)



CO2andGHG-countries-in2006-2005(GB)_tcm61-36276.xls.

[226] A large part of the relevant legal literature suggests that the main polluting nations can be held responsible under international law for the harmful effects of their greenhouse-gas emissions. As a result, affected countries may have a substantive right to demand the cessation of a certain amount of emissions. In some cases, they also have the procedural means to pursue intergovernmental litigation in an international judicial forum such as the International Court of Justice. Developing countries are understandably reluctant to challenge any of the big donor nations in an international court. For a possible legal argument for such a lawsuit and some observations on the potential impacts of bringing a case before an international court, see Schwarte, C. & Byrne, R. "International Climate Change Litigation and the Negotiation Process," *Oil, Gas & Energy*, November 2010.

Source: World Resources Institute

Regardless of what the U.S. Congress does or does not legislate in climate change issues, with EU emissions probably having peaked and U.S. emissions possibly having done so as well, at least for the foreseeable future, the fate of Article 2 of the UNFCCC[227] more and more resides in the actions of China, Brazil, India, and the other large developing country emitters. Conceivably, the U.S. would eventually accept a Kyoto-like approach if means could be found to involve developing countries with specific obligations. However, the politics of negotiating subsequent steps and a long-term target for GHG emission reduction are full of difficulty as was obvious at the 2009 COP-15 in Copenhagen, where the U.S. and the EU accused China of forcefully obstructing progress in the climate change negotiations. One wonders why China is so vehemently opposed to legally binding commitments under a strong multilateral climate regime and to international checks to verify that it is on track to slow down GHG emissions. Not only are developing countries unlikely to assume binding obligations until industrialized countries have actually met some initial targets, but their potential assumption of obligations would raise the difficult question of equity.[228] With per capita CO_2 emissions from fossil fuels in the U.S. about 4 times those of China and 20 times of India, questions of equity loom large when long-term limits are considered.

[227] Article 2 of the UNFCCC stipulates that:

The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

[228] For a proposal of differentiated obligations among the UNFCCC parties regarding mitigation, adaptation, and financial commitments, see Ott, H. *et al*. "South-North Dialogue on Equity in the

Nevertheless, limited progress on this issue has occurred. Starting with the COP-13 in Bali in 2007 and culminating at the 2010 COP-16 in Cancún, developing countries enthusiastically embraced a plan for voluntary accession to limits and reduction crediting in the forest sector (the so-called Reducing Emissions from Deforestation and forest Degradation [REDD] program), predicated, however, on financial support from developed countries.

At the same time, developing countries are watching this environmental negotiating process to ensure that it helps them cope with climate change without threatening their hopes of economic growth.[229] Officials are beginning to consider the possibility that a world climate change agreement might not be merely a crude attempt to cut off their economic growth, but rather a possible source of help in dealing with the air pollution that is emerging as a major threat to public health.[230] The ideal situation would be to have both developing nations on board and the U.S. Senate ratify the Kyoto Protocol. This is currently unrealistic. We need to find a compromise.

Rich countries generally favor the creation of a new climate pact to succeed the Kyoto Protocol, placing more responsibility on key developing country emitters such as China and India, whereas developing countries continue to favor an approach that would implement a second phase of the Kyoto Protocol, which allows them to opt out of emissions reductions if these pose a threat to development.[231] In fact, the Chinese authorities have emphasized that the key to success in climate negotiations lies in

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Greenhouse: A Proposal for an Adequate and Equitable Global Climate Agreement," Eschborn: Deutsche Gesellschaft für Technische Zusammenarbeit, 2004.

[229] Anderson, J.W., "Climate Change Diplomacy: The Next Step," in *Resources*, Winter 2001, Issue Number 142, pp. 11-13, at 11.

[230] Ibid., at p. 13.

commitments by rich countries to slash emissions and boost funding to developing countries in the form of aid and the promotion of clean technology.[232] China has concerns over emissions commitments because it expects GHG emissions levels to continue rising for some time. In fact, over the past decade, China's GHG emissions have more than doubled.[233] This means that the EU's proposal to raise the bloc's target for cutting CO2 emissions would have a limited impact on global warming, given that any benefit would be easily offset by China's rise in GHG emissions.[234]

However, since the 2010 COP-16 in Cancún, China's attitude to combat climate change has been remarkable, by taking increasingly strong action to improve its energy efficiency, at both the national and sub-national level. For example, China has set a 2020 carbon intensity target as part of its national policy and is taking aggressive steps to implement it. Moreover, China has prepared a five-year plan (2011-2015) that is the clearest indication of its determination to become a clean-energy powerhouse.[235] This five-year plan puts emphasis on economic and industrial restructuring towards a greener, more efficient, and lower carbon economy. As part of this five-year plan, China is also developing regional domestic carbon trading programs and is also experimenting with emissions taxes.

Climate change is one of the key drivers for China's fundamental shift. Investment in clean energy in China rose 30 per cent in 2010, to US$51.1 billion—by far

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[231] ICTSD, "China Stands on Unconditional Climate Funding ahead of Cancún Talks," *Bridges Trade*, Vol. 10, No. 1, 22 November 2010.
[232] Ibid.
[233] Ibid.
[234] Gallagher, K. "China Needs Help with Climate Change," *Current History*, pp. 389-394, November 2007 (stating that the growth rate of GHGs in China has been breathtaking).

the largest figure for a single country—and represented more than 20 per cent of the total global investment of US$243 billion, according to Bloomberg New Energy Finance.[236] China's climate policy is largely motivated by factors other than concern about global warming, including energy security, the need to reduce local and regional atmospheric pollution from coal combustion that has caused serious health problems, and international competitiveness.[237] It has pushed development of renewable energy technology to become the market leader in production of wind and solar technology, and adopted aggressive fuel economy standards for motor vehicles.

However, China has been, and would like to continue as, the *de facto* leader of the G-77 group of developing countries, which is the UNFCCC/KP negotiating bloc for most developing countries. Accordingly, it would prefer not to take steps that would alienate other developing countries and jeopardize its role, unless there are very large compensating economic or other gains to be had. At the same time, China is also a member of the BRICS group (Brazil, Russia, India, China, and South Africa) to coordinate climate and energy policies. Furthermore, China's interests, like those of Brazil and a few other developing countries, no longer align with the G-77 very well since some of these major developing countries are among the largest GHG polluters in the world today. Moreover, China is not only the largest GHG emitter, but the leading

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[235] Wei, S. & Mabey, N. "Chinese Challenge or Low Carbon Opportunity? The Implications of China's 12th Five-Year-Plan for Europe," *E3G Briefing*, January 2011, available at http://greengrowthleaders.org/wp-content/uploads/2011/02/E3G_Chinese_Challenge_or_Low_Carbon_Opportunity1.pdf.

[236] Kanter, J. "China, Once Suspect on Emissions, Is Rapidly Becoming a Clean-Energy Power," *The New York Times*, 26 January 2011, http://query.nytimes.com/gst/fullpage.html?res=9D05E0DF113EF935A15752C0A9679D8B63.

[237] Indeed, China's environment minister issued in 2011 an unusually stark warning about the effects of unbridled development on China's air and soil, arguing that the nation's current path could stifle long-term economic growth and feed social instability. See Jacobs, A. "China Issues Warning on Climate and Growth," *The New York Times*, 28 February 2011.

producer of wind turbines and solar panels. How will this aggressive move into renewable energy markets affect its climate positioning *versus* other countries?

4.3. European Union Position

The European Union has long held a leadership position on climate change and has some of the strongest domestic support to address climate change.[238] Moreover, the EU has been a firm supporter of the Kyoto Agreement,[239] and it has been among the foreign

[238] See, for instance, Oberthür, S. & Pallemaerts, M. (eds.) *The New Climate Policies of the European Union: Internal Legislation and Climate Diplomacy*, Brussels: Brussels University Press, 2010; Dupont, C. "Political Commitment to Climate Policy Integration at EU Level: The Case of Biodiversity Policy," *Edinburgh Europa Paper Series*, 2010/05, 2010; Wurzel, R. & Conelly, J. *The European Union as a Leader in International Climate Change Politics*, Routledge, 2010.

[239] There is a very rich literature on the EU's position regarding climate change. See for instance Droege, S. "Climate Policy and Economic Bust: The European Challenges to Create Green Stimulus," 2 *Carbon & Climate L. Rev.,* 135 (2009); Bluemel, E. "Unraveling the Global Warming Regime Complex: Competitive Entropy in the Regulation of the Global Public Good," 155 *U. Pa. L. Rev.,* 1981 (2007); Boeters, S. et al. *Post-2012 Climate Policy Scenarios,* Netherlands Environmental Assessment Agency, 2007; Bugge, H. "Meeting the Kyoto Challenge: The Case of Norway," *5 Int'l Energy L. & Tax. Rev.,* 140 (2006); Carlane, C. *Climate Change Law & Policy: EU and US Perspectives*, Oxford University Press 2010; Cass, L. *The Failures of American and European Climate Policy: International Norms, Domestic Policies, and Unachievable Commitments*, State University of New York Press, 2006; Chapman, J. "The EU ETS: Experience to Date and Lessons for the Future in Stewart, R. et al. (eds.), *Climate Finance: Regulatory and Funding Strategies for Climate Change and Global Development,* NYU Press, 2009; Del Guayo, I. "The Implementation of the Flexible Mechanisms of the Kyoto Protocol in Spain," 4 *Int'l Energy L. & Tax. Rev.,* 114 (2006); Derwent, H. "Carbon Market Design: Beyond the EU Emissions Trading Scheme" in Stewart, R. et al. (eds.), *Climate Finance: Regulatory and Funding Strategies for Climate Change and Global Development,* NYU Press, 2009; Dowden, M. *Climate Change and Sustainable Development: Law, Policy & Practice*, EG Books, 2008; Douma, W. et al (eds.), *The Kyoto Protocol and Beyond: Legal and Policy Challenges of Climate Change,* T.M.C. Asser Press, 2007; Ferjentsik, V. & Ash, M. "An EU Sky Trust: Can a Lower-Income Country Afford Climate Policy?*"* 16(5) *Envtl. Liability*, 183 (2008); Glienke, N. "External Reporting of the Risks Linked to the EU ETS – an Exploratory Study of German HDAX Non-Financial Corporations," 2 *Carbon & Climate L. Rev.*, 143 (2009); Grobbel, M. *Implementing Climate CHange Measures in the EU: Key Success Factors*, Wiesbaden, 2009; Harris, P. "The European Union and Environmental Change, Sharing the Burdens of Global Warming," 17 *Colo. J. Int'l Envtl. L. & Pol'y,* 309 (2006); Hedemann-Robinson, M. "Climate Change Policy: EU and International Developments," 14 *Envtl. Liab. CS1* (2006); Hilson, C. "Going Local? EU Law, Localism and Climate Change," 33(2) *Euro. L. Rev.,* 194 (2008); Hobday, S. "The Energy Review: Balancing Climate Change with the United Kingdom's Energy Security Challenge," 7 *Int'l Energy & Tax. Rev.,* 195 (2006); Kearny, T. "Market-based policies for demand side energy efficiency: A comparison of the New South Wales Greenhouse Gas Abatement Scheme and the United Kingdom's Energy Efficiency Commitment," 23(2) *Envtl. & Plan. L.J.,* 113 (2006); Kunzlik, P. "The Procurement of 'Green' Energy," in Arrowsmith, S. & Kunzlik, P. (eds.) *Social and Environmental Policies in EC Procurement Law: New Directives and New Directions*, Cambridge University Press, 2009; Nanda, V. "The European Union's Multinational Carbon Trading Program," 85 *Denv. U. L. Rev.*, 995 (2007-2008); Park, P. "The Implementation of the Flexible Mechanisms of the Kyoto

voices to react to former President G.W. Bush's decision to abandon the treaty. Its objective (and that of its then 15 Member States) was to ratify Kyoto and have it in force by 2002 at the latest, which only happened in 2005.[240] In an encounter between officials of the EU and the U.S. in Washington in early April 2001, European officials clearly said they were going to continue with the Kyoto process, even if the U.S. was absent. In fact, some Europeans saw the COP-6 at The Hague as an opportunity for European governments to show leadership and initiative.[241] Among Europeans, there is a profound mistrust of the market mechanisms that the Americans propose in order to reduce the cost and impact of reductions.[242] On the other hand, the American view is that the European intransigence of asking parties to the Kyoto Protocol to accept Kyoto's commitments as they stand has killed the Kyoto Protocol because the current situation is unacceptable to the U.S.

In response to former President G.W. Bush's decision to avoid his responsibility *vis-à-vis* the environment, former European Commission President Romano Prodi said to *La Repubblica* newspaper that "if one wants to be a world leader, one must know how to look after the entire Earth and not only American industry."[243]

Protocol in the United Kingdom," 6 *Int'l Energy L. & Tax. Rev.*, 156 (2006); Peeters, M. & Deketelaere, K. *EU Climate Change Policy: The Challenge Of New Regulatory Initiatives*, Edward Elgar Publishing, 2006; Pielow, J. & Luder, S. "Kyoto Developments in Germany: Emissions Trading, 6 *Int'l Energy L. & Tax. Rev.*, 163 (2006); Robinson, J. *Climate Change Law: Emissions Trading in the EU and the UK*, London: Cameron May, 2007; Stallworthy, M. "Sustainability, the Environment, and the Role of UK Corporations," 17(6) *Int'l Company & Comm. L. Rev.*, 155 (2006).

[240] See Interview given to Margot Wallström, former European Environment Commissioner, in *Europe, The Green Issue*, published by the Delegation of the European Commission to the U.S., February 2001, pp. 14-15, at 15.

[241] Anderson, J.W., "Climate Change Diplomacy: The Next Step," in *Resources*, Winter 2001, Issue Number 142, pp. 11-13, at 13.

[242] Anderson, J.W., "Climate Change Diplomacy: The Next Step," in *Resources*, Winter 2001, Issue Number 142, pp. 11-13, at 11.

[243] BBC News, "Europe backs Kyoto accord," 31 March 2001, available at http://news.bbc.co.uk/1/hi/world/europe/1252556.stm.

Furthermore, Margot Wallström, former European Commissioner for the environment, reacting to a statement from the U.S. administration on their rejection of the Kyoto Protocol, said: "The U.S. position is extremely worrying. The U.S. must understand that this is not a marginal issue for the EU. It has implications for external relations including trade and economic affairs, and it cannot be played down."[244] Kjell Larsson, Sweden's former environment minister, said in a statement following meetings with U.S. administration officials on Kyoto: "Climate change is happening now and is a serious threat to the future of mankind. We are prepared if necessary to go forward without the U.S. We cannot allow one country to declare as dead the process for addressing this major global issue. However, we still hope to have the United States involved in the protocol as soon as possible."[245] Also Gerhard Schröder, former chancellor of Germany, reacting to the U.S. administration's decision to reject Kyoto, said: "Nobody should be relieved from his responsibility for climate control."[246]

4.3.1. EU Emissions Cuts

Some people argue that in the EU there is much talk but little action concerning Kyoto. Even from a more technical view point, European finance and trade ministers are unlikely to let environmental ministers impose costly limits on emissions unless the U.S. is also on board.

[244] See press release "Commission reacts to US statements on the Kyoto Protocol," 29 March 2001, available at http://www.delcan.ec.europa.eu/en/press_and_information/press_releases/2001/01PR004.shtml.
[245] See *Europe*, Europe Update, April 2001, Volume IX, Number 4.
[246] Ibid.

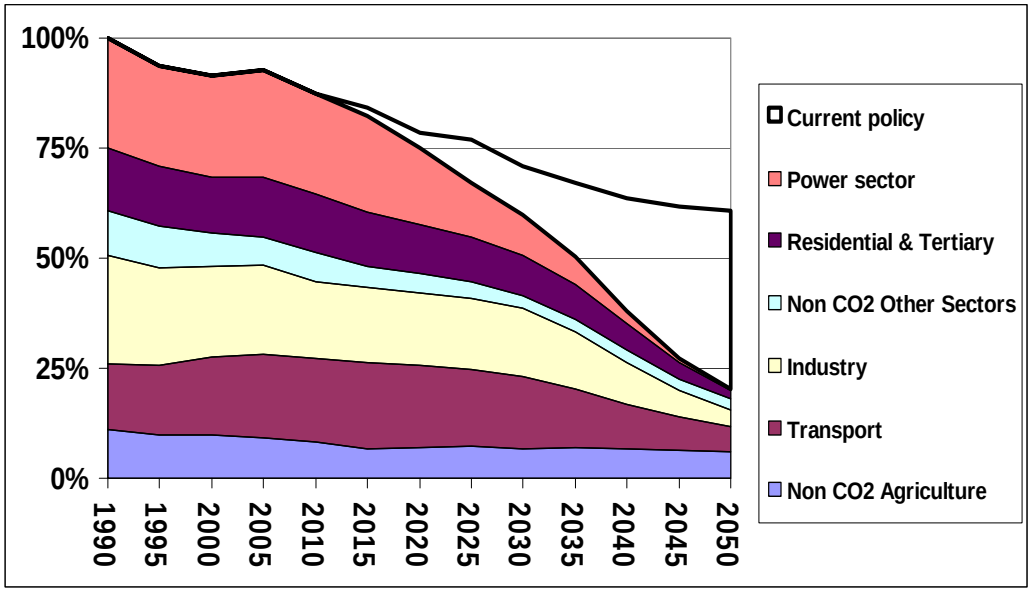
However, a new report by the European Environment Agency (EEA) based on GHG emission data for 2008-2009 shows that large drop in emissions during 2008 and 2009 gives the EU-15 a head start to reach and even over-achieve its 8 per cent reduction target under the Kyoto Protocol.[247] The EEA report also shows that the EU-27 is well on track towards achieving its 20 per cent reduction target by 2020.[248] Moreover, a report from the European Commission to the European Parliament and the EU Council shows the actual progress and determination in the EU to reduce emissions toward meeting the Kyoto target.[249]

More recently, the EU has been arguing that emissions reduction is good for European business, thereby moving away from traditional reasons for deeper cuts in GHG emissions such as moral responsibility and survival of humankind.[250] Furthermore, a 2011 analysis by the European Commission shows "that domestic emission reductions of the order of 40% and 60% below 1990 levels could be achieved in a cost-effective way by 2030 and 2040, respectively. This is illustrated in [the chart below]. Such a pathway would require an annual reduction compared to 1990 of approximately 1 percentage point in the first decade until 2020, 1.5 percentage points in the second until 2030, and 2 percentage points in the last two decades until 2050. The effort would become greater

[247] European Environment Agency, "Tracking Progress Towards Kyoto and 2020 Targets in Europe," EEA Report, No. 7/2010, p. 30.
[248] Ibid., at pp. 31-2.
[249] European Commission, "Progress Towards Achieving the Kyoto Objectives," COM(2010) 569 final, 12 October 2010.
[250] See Chaffin, J. "EU warms to business of climate change," *Financial Times*, 30 November 2010.

over time as a wider set of cost-effective technologies would become available."[251] This means that GHG emissions would be reduced by a further 5 per cent.

EU GHG emissions towards an 80 per cent domestic reduction (100%=1990)

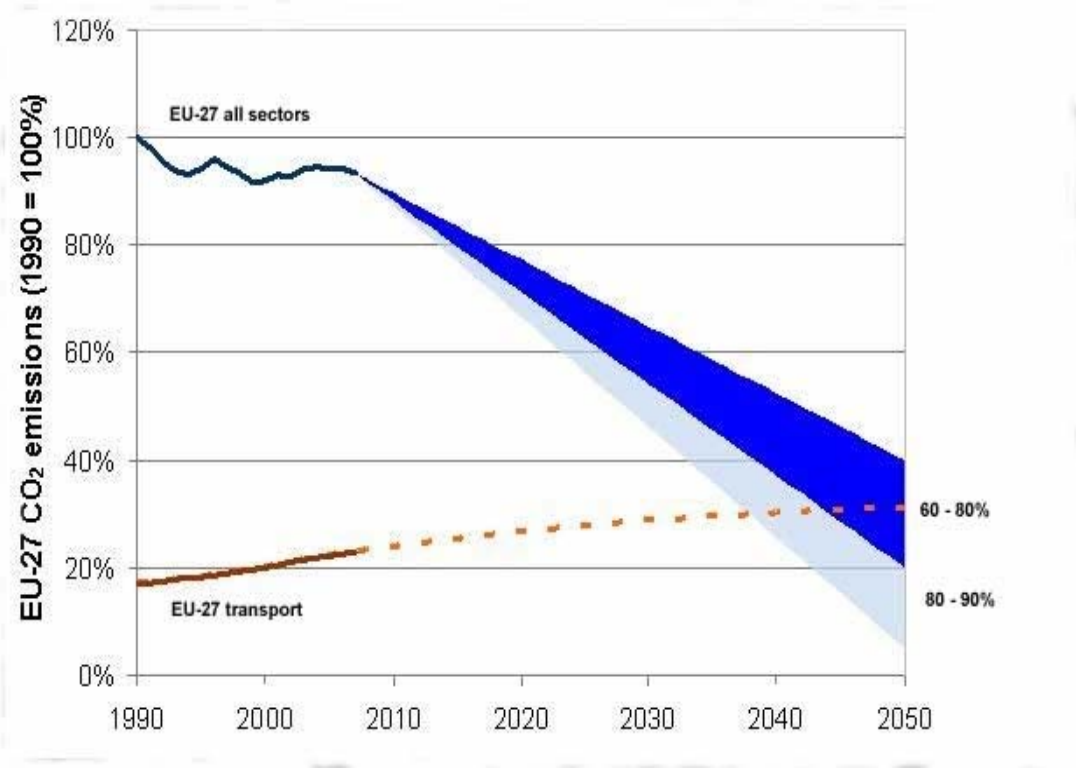


Source: European Commission

However, the only sector where the EU's GHG emissions continue to rise is in the transport sector. This may complicate the EU's target to reduce its GHG emissions between 80 per cent and 95 per cent by 2050 compared to the 1990 levels,[252] since transport is one of the largest energy-consuming sectors in the EU, accounting for one-third of EU energy consumption. The chart below shows the projection of GHG emissions growth in the EU should things remain business as usual.

[251] Communication from the European Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions, "A Roadmap for Moving to a Low Carbon Economy in 2050," p. 4, 2011.
[252] See a study by Christian Egenhofer, "The EU should not shy away from setting CO2-related targets for transport," Policy Brief No. 229/January 2011, Centre for European Policy Studies.

Projected EU GHG emissions growth: transport v. non-transport sector



Source: European Commission

4.3.2. EU Emissions Trading Scheme

The EU's Emissions Trading Scheme (ETS)[253] is the world's most important GHG emissions trading scheme,[254] with an estimated value of EUR 63 billion of the overall EUR 86 billion value of the global carbon market in 2008.[255] Operational since 2005, the ETS's goal is to cut emissions by one-fifth from 1990 levels by 2020. It is the flagship

[253] Directive 2003/87/EC, in force since 25 October 2003.
[254] On the EU emissions trading scheme, see generally Morgera, E., Kulovesi, K. & Muñoz, M. "The EU's Climate and Energy Package: Environmental Integration and International Dimensions," *Edinburgh Europa Paper Series*, No. 2010/7, 2010; see also Egenhofer, C., Alessi, M., Georgiev, A. & Fujiwara, N. "The EU Emissions Trading System and Climate Policy towards 2050: Real incentives to reduce emissions and drive innovation?" Special Report, Centre for European Policy Studies, 2011(which addresses the fundamental question of whether the ETS has lived up to its promise to "promote reductions of greenhouse gas emissions in a cost-effective and economically efficient manner", and if not, what the prospects of its doing so are in the future and what additional changes will be required).

policy covering half of the EU's carbon emissions,[256] and could turn intended restrictions on pollution into a trap that commits the EU to increasing carbon emissions for much of the next decade, unless changes are swiftly introduced.[257]

Both the Fourth Assessment Report by the IPCC and the Stern Review on the Economics of Climate Change make clear the point that a price for GHG emissions is one of the most effective ways to mitigate climate change.[258] The ETS is on course to require savings of, at best, a miniscule quantity of 32 million tons of emissions between 2008 and 2012, despite covering 12,000 installations and 1.9 billion tons of emissions annually.[259] Regulating a single power station over the same period could have had a greater impact.[260] An already weak cap for this period became a severe over-allocation of pollution permits when the 2008 economic recession caused a sharp drop in production and therefore carbon emissions. These lower emissions, far from helping the EU towards a low carbon future, may actually trap it into continued high carbon economy because the ETS allows the huge volume of unused permits to be carried over into the next phase of

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[255] Capoor, K. & Ambrosi, P. "State and Trends of the Carbon Market 2009," Washington, D.C.: The World Bank, May 2009, pp. 1-2.

[256] On 20 December 2010, EU environment ministers agreed to bring Switzerland into the EU's ETS. The ETS already includes other non-EU European countries such as Norway, Liechtenstein, and Iceland. See EurActiv, "Switzerland moves to join Europe's carbon market," available at http://bit.ly/ha7Mvu.

[257] See Sandbag, "Cap or Trap? How the EU ETS Risks Locking-in Carbon Emissions," September 2010, available at http://sandbag.org.uk/files/sandbag.org.uk/caportrap.pdf.

[258] See "Summary for Policymakers," in Pachauri, R.K. and Reisinger, A. (eds.), *Climate Change 2007: Synthesis Report*, Cambridge University Press, 2007, p. 18; Stern, N. *The Economics of Climate Change: The Stern Review*, Cambridge University Press, 2007, p. 349.

[259] This estimated figure of 32 million tons saving over five years (2008-2012) assumes a rapid European economic recovery (to 2008 levels by 2011). This means that even if the economy recovers quickly from the 2008 financial crisis, caps will only be 32 million tons lower than the actual emissions in that period. A slower recovery would mean that the caps stayed above the carbon emissions, providing no constraint on emissions.

[260] Drax power station in the UK is estimated to have a cap on emissions 60 metric tons below its emissions in Phase 2. Caps like those given to Drax add up to an overall cap for large power installations that would have led to 1.1 billion expected savings, a genuine cap on pollution that could have driven emissions reductions and clean energy investment. However, this has been all but cancelled out by extravagant free

the scheme that runs from 2013 to 2020. These permits would then be available for companies as the economy picks up again from the 2008 economic recession, removing a key driver for investment in low carbon options. The ETS in its current form, although a very powerful and effective policy in principle, is in danger of actually hindering a low carbon economy for years to come.[261]

There are a few ways to solve the ETS and avoid the carbon trap.[262] These involve compensating for the fact that too many permits have been put into the system, and include the following points:

1. increasing the EU carbon reduction target from 20 per cent to 30 per cent by 2020. The EU has already achieved half of the existing target and a higher target would protect momentum towards low carbon future;[263]
2. setting caps for the next trading phase (2013-2020) based upon actual emissions and not on the permits allocated, which were too many. This would require holding back 1.4 billion tons of permits from the scheme from the start, whilst a political decision is reached to cancel the permits permanently. This decision must be reached as quickly as possible;
3. Amending the rules of the ETS (through a change in the directive[264]) to allow flexibility to respond to large drops in demand such as those caused by the 2008

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allocations to heavy industry such as iron and steel, creating a billion more permits than are needed to cover their emissions.

[261] The volume of surplus permits in the trading scheme is now so high that the EU could increase emissions until as late as 2016 when they could reach almost a third higher than 2010 levels.

[262] See Ellerman, D. & Joskow, P. "The European Union's Emission Trading System in Perspective," Pew Center on Global Climate Change, 2008.

[263] For the specific case of the UK, see Skea, J., Ekins, P. and Winskel, M. (eds.) *Energy 2050: Making the Transition to a Secure Low-Carbon Energy System*, London: Earthscan, 2010 (which explores in detail the factors which could help or hinder the attainment of the UK's climate change targets, and how these factors interact with the parallel objective of maintaining a robust and secure energy system).

economic recession, in order to prevent an inundation of permits undermining carbon savings.

These measures face some stiff resistance. While too many permits have been handed out overall, this was not done evenly across those companies covered by the scheme. Some companies received a cap lower than their emissions, but others higher. A few of the latter received an enormous over-allocation of permits, making millions from their sale. These are the 'carbon fat cats', led by steel conglomerate ArcelorMittal, and a number of them are lobbying hard to keep the ETS broken.[265]

Millions of EU citizens are working hard to reduce their carbon emissions, saving a ton here, half a ton there. The ETS covers 1.9 billion tons annually, including those from electricity production. To allow the ETS to fail, providing miniscule carbon savings and allowing some 'carbon fat cats' to make huge profits though over-allocated permits, would be a travesty.[266]

Moreover, since the international negotiations for the creation of a global climate change agreement did not reach a conclusion in Copenhagen in 2009, the provisions of the Emissions Trading Directive on bilateral agreements have become more relevant than ever. International credits from projects or other emission-reducing activities in a third

[264] Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for GHG emission allowance trading within the Community and amending Council Directive 96/61/EU, OJ L275, 25 October 2003; this Directive has been amended most recently by Directive 2009/29/EC, so as to improve and extend the GHG emission allowance trading scheme of the Community, OJ L140/63, 5 June 2009.

[265] The surplus permits held by the top 10 'carbon fat cats' in 2009 nearly quadrupled, growing from 33 million permits to 119 million. These would currently be worth roughly €1.7 billion if sold on the carbon market. ArcelorMittal is likely to accrue 102 million more permits than it needs. See Sandbag, "Cap or Trap? How the EU ETS Risks Locking-in Carbon Emissions," September 2010, available at http://sandbag.org.uk/files/sandbag.org.uk/fatcats2009.pdf, pp. 35-42.

country are eligible for use in the EU ETS only if an agreement has been concluded between the EU and the respective third country.[267] Furthermore, the Emissions Trading Directive also stipulates that once an international agreement on climate change has been reached, from 2013 onwards, international credits are disqualified from use within the EU ETS if these credits are generated from projects from third countries that have not ratified the said agreement.[268]

5. Recommendations

Given the lack of understanding at a global level, here are some recommendations for future international environmental *fora*:

1. Environmental taxes. They are very common in the EU and very unpopular in the U.S. The idea is to penalize bad environmental performers by placing higher taxes on those actors whose GHG emissions are high and to give credit to good environmental performers in order to promote environmentally friendly behavior and create an incentive for alternative power generation from wind, sun, and water. The counterargument is that hydropower as well as wind and geothermal energy are clean but naturally limited. As for solar energy, it is useful at the moment only for small-scale applications because no practical system exists yet for storing it for use at night or in bad weather. Natural gas, more efficient at producing energy than coal, is currently in short supply.[269]

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[266] For an analysis of the ETS from the perspective of the principle of proportionality, see Holwerda, M. "Subsidizing Carbon Capture and Storage Demonstration through the EU ETS New Entrants Reserve: A Proportionality Test," *Carbon and Climate Law Review*, No. 3/2010, pp. 228-239.
[267] Directive 2003/87/EC, Article 11a (5).
[268] Directive 2003/87/EC, Article 11a (7).
[269] See Richter, B., "Learning What Fuel To Burn," *The New York Times,* Tuesday, April 17, 2001, p. A19.

A global carbon tax is also a sensible recommendation. The idea behind it is a tax that would decrease the profits of users of carbon-based fuels and increase them for users of alternatives. In that same way, a tax on vehicles based on their fuel efficiency would help achieve the Kyoto goal. Expanded economic incentives, such as tax breaks, for the development of more efficient systems of all types, would help us move faster toward minimizing our dependence on carbon-based fuels.[270]

However, it is not easy to ascertain the exact amount of a tax. An alternative solution is to trade emission rights within a certain cap amount of GHG emissions. Both methods are essentially the same, but with a different approach. That said, the question remains: which should be set first—the price (tax) or the quantity (GHG emission allowance)? The practice of each, however, is different and most people prefer the cap-and-trade system because it creates markets that can link up and yield cost efficiency and positive scale and diversifying effects. Also, the cap-and-trade approach responds better to the business cycle than a tax would. Having said that, there are cases where, arguably, a tax would work better.

2. Estimating environmental damage before making environmental policy. More and better environmental data are needed to create more efficient environmental policy that will slow down the rapid level of damage to the climate. However, this does not mean that no action should be taken until we have better data.

3. Information instruments. There could be a requirement of mandatory reports from every industrial firm regarding GHG emissions which will be available to governments and the general public (by publishing it on the companies' web sites). For example, if

[270] Ibid.

General Motors (GM) has a poor record on GHG emissions in comparison with Volvo, this can be utilized as consumer market pressure, so that GM tries to reduce its GHG emissions. It is difficult, though, to know *prima facie* whether this proposal will be effective or how much of the work we can expect consumer-responses to do.

It is also important to educate people to understand the seriousness of the problem. Consumers can then decide more objectively what product (cars, engines) to buy.

4. Development of alternative technologies rather than a timetable approach. Kyoto's decision was to opt for arbitrary short-term emissions targets, which has proven to be counterproductive. In market economies, governments do not control emissions directly, and thus it is extremely hard to set strict binding future targets. Instead of this particular timetable approach by 2008-2012, we could have non-binding targets or different timetables from the one in the Kyoto Protocol. We should also invest in developing efficient technologies, which is more interesting both to developing and developed countries. I am personally in favor of developing efficient technologies and also transferring them to developing countries. For example, a new technology that would filter out CO2 in cars.

The attempts to create zero-emission vehicles are numerous. In California, for example, there is the 0 per cent emissions policy in cars. However, these attempts remain politically difficult.[271] The first attempt was made by General Motors Company between

[271] See Leal, W. (ed.) *The Economic, Social and Political Elements of Climate Change*, Berlin: Springer, 2011 (dealing with the social, economic, and political aspects of climate change, exemplifying the diversity of approaches to climate change management taking place all over the world).

1996 and 1999 with the creation of a 100 per cent electric car named EV1.[272] A few years later, all the models were removed for unclear reasons. Renault aims to release its first fully electric car in 2011.[273]

One could argue that, even if the consumer's reaction was perceived as positive, it appeared that this type of market would not be profitable for the car industry, removing the profitable maintenance of oil-based engines. The electric cars alternative[274] consumes electric energy if this energy is obtained via combustion (of coal or oil),[275] which causes CO2 emission and therefore does not solve the problem.[276]

In 2004, Toyota created a gasoline-electric hybrid, which, while running, recharges its battery.[277] This cuts the fuel consumption by half. Other cars burn hydrogen instead of gasoline. The hybrid models developed by Toyota are, however, not as effective as initially expected. Compared to the size of the cars and the normal

[272] See "General Motors Friendly Vehicles," available at http://198.208.187.166/about_gm/tech_center/friendly_vehicles.html.

[273] Renault, "The Electric Vehicle, A Global Strategy," available at http://www.renault.com/en/capeco2/vehicule-electrique/pages/vehicule-electrique.aspx.

[274] For more information on electric cars, see "Electric Cars: A Sparky new Motor," *The Economist*, 9 October 2010, pp. 83-84; also, "Electric Cars: Highly Charged Motoring," *The Economist*, 9 October 2010, pp. 18-21 (arguing that electric cars are neither as useful nor as green as their proponents claim).

[275] See the analysis by Gary Davis asking the question: what are their real environmental impacts when charging with electricity from power stations is taken into account? Davis, G. "Your new electric car emits 75 gCO2/km (at the power station)," *Ecometrica*, 2011, available at http://d3u3pjcknor73l.cloudfront.net/assets/media/pdf/electric_car_emits_75_gCO2_per_km.pdf.

[276] However, according to research conducted by Rice University's Baker Institute for Public Policy, electric cars hold greater promise for reducing emissions and lowering U.S. oil imports than a national renewable portfolio standard. The whole premise of the study is based on the assumption that power generation will come from gas, not coal. The published research can be found at http://www.bakerinstitute.org/programs/energy-forum/publications/energy-studies/energy-market-consequences-of-an-emerging-u.s.-carbon-management-policy.

[277] Toyota Motor Corporation, "Toyota Prius Gasoline-Electric Hybrid Synergy Drive," available at https://techinfo.toyota.com/techInfoPortal/staticcontent/en/techinfo/html/prelogin/docs/priusdisman.pdf.

consumption of such models, the actual CO2 emissions are very low (89g/km).[278] However, emissions remain greater than for some other smaller models.

Another option is natural gas engines, which offer a better way to cut emissions because they are cheaper. Fiat is the market leader in Europe in natural-gas engines. Natural gas is a more affordable solution as it is less expensive to produce, transport, and distribute compared with other fuel sources. While Italy's natural-gas vehicle market is one of the most robust in the world, the market is still in its infancy in the U.S. General Motors only began selling vehicles with natural-gas engines in the U.S. in 2010 for fleet buyers.[279]

As economies grow, they consume more and more energy. Developed countries can help by offering developing countries support for greener energy technologies.[280] We need, therefore, more R&D funding for alternative energy sources and for energy conservation. We need to move toward developing new, renewable energy sources, such as wind and solar energy.[281] This is for the scientific community to develop. My suggestion is the use of more efficient power sources for transportation, carbon-free energy sources such as more advanced nuclear power plants and effective solar power systems. The U.S. Government needs to reverse course before more crucial time is lost. For that, we need effective political leadership in order to get us moving in the right direction.

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[278] Act on CO2, "New car CO2 emissions: Top 10 search," available at http://actonco2.direct.gov.uk/home/what-you-can-do/On-the-move/Compare-car-CO2-emissions/top-10-fuel-efficient-cars.html (select 'All' for 'Class,' 'Gearbox,' and 'Fuel').
[279] "Fiat Turns to Natural Gas for U.S. as Toyota, GM Go Electric," *Bloomberg*, 2 December 2010.
[280] See for instance Lovins, A. "Energy Strategy: The Road Not Taken?" *Foreign Affairs*, October 1976.
[281] At the moment, countries may choose between clean energy or cheap energy, but not both. See "Clean and green, for a price," *The Economist*, 11 December 2010, pp. 31-32. See also Delucchi, M. & Jacobson, M. "Providing all global energy with wind, water, and solar power, Parts I and II," *Energy Policy*, 2010.

The idea of making use of nuclear power poses problems such as safety, high cost, and waste. Most EU Member States, with the exception of the United Kingdom and France, are phasing out nuclear power.

5. A two-speed Protocol on Climate Change with a dual timetable. As mentioned earlier under the section regarding the options we have under the current situation, the Kyoto Protocol failed. A solution could be an amended Kyoto Protocol[282] with: 1) a longer time-frame for GHG emission reductions, 2) initially, a lower level of emission reduction with a gradual increase in GHG emissions reduction, and 3) a larger number of countries involved.

The first point is the idea of a longer time-frame for GHG emission reductions whereby every ten years there will be a new target. In the chart below, I have arbitrarily assigned even years to industrialized nations (2020, 2030, 2040,…) and uneven years to developing nations (2015, 2025, 2035,…). This would create an important dynamic that would keep the international community engaged in an ongoing commitment to limit global warming. As for developing countries, the year by which to have them on board is 2015, since by then major developing countries will be among the largest polluters of carbon dioxide in the world.[283] The next reference year would be 2025, since by then the developing world will most likely have overtaken the developed world in producing carbon dioxide. From there, the commitment will be every ten years and targets will change.

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[282] Erik Haites and a team of researchers have also suggested an alternative to the Kyoto Protocol. See Haites, E. "The São Paulo Proposal for an Agreement on Future International Climate Policy," in Douma, W., Massai, L. & Montini, M. (eds.) *The Kyoto Protocol and Beyond: Legal and Policy Challenges of Climate Change*, The Hague: TMC Asser Press, 2007, pp. 201-222.

[283] See the following chart regarding the projections for the world's CO2 emissions by region from 1990 to 2030, available at http://photos.mongabay.com/09/forecast_co2.jpg.

As for the second point, since the G.W. Bush administration claimed that part of the reason it did not agree with Kyoto was because achieving its goal would be economically painful and harmful to the U.S. economy, we propose in the chart below a 50 per cent cut in the emission reductions currently required by Kyoto for industrialized nations. This means that the U.S. will have a reduction of 3.5 per cent instead of 7 per cent below 1990 levels, the EU will face a reduction of 4 per cent instead of 8 per cent below the 1990 levels, and Japan 3 per cent instead of 6 per cent below 1990 levels. Environmentally, this might not be the best solution (today the debate is to have a more ambitious GHG emissions reduction than that stipulated in the Kyoto Protocol, not the other way around), but it is better than throwing in the towel and, therefore, having to start from scratch. Once there has been a fifty per cent cut in the emission reductions from the original request in the Kyoto Protocol, we suggest a gradual increase in GHG emissions reduction every ten years until we reach 35 per cent below 1990 levels by year 2050 in the case of developed nations.[284] However, developing countries will not have a reduction of GHG emissions based on the 1990 levels, but on the 2000 levels. This means that the international community will take into account the more difficult situation in which developing countries find themselves and will ask them to start from the 2000 levels and reach a gradual reduction below the 2000 levels, starting with 1 per cent below the 2000 levels by the year 2015 to reach 25 per cent below the 2000 levels by the year 2045 in the specific case of China.

With regard to the third point, we believe in the importance of also having developing countries on board since this is a global issue. However, being aware of the

[284] For a study of personal observations and predictions about the effects of boreal warming by 2050, see

financial limitations that developing countries face, we believe that a way to make this system feasible is through alternative environmental technology transfer from developed countries to developing countries.

A Proposal for a Two-Speed Protocol on Climate Change with a Dual Timetable

Kyoto Protocol		NEW PROPOSAL:				
		Industrial Nations			Developing Nations	
U.S. Targets						
Year	***(percentages)***	**Year**	**U.S.**	**EU**	**Japan**	**Year**	**China**
			(percentages)			***(percentages)***[285]	
2008/2012	**7%**	**2008/2012**	**3.5%**	**4%**	**3%**	**2015**	**1%**
2020	**14%***	**2020**	**8%**	**9%**	**7%**	**2025**	**6%**
2030	**21%***	**2030**	**16%**	**18%**	**15%**	**2035**	**15%**
2040	**28%***	**2040**	**24%**	**26%**	**23%**	**2045**	**25%**
2050	**35%***	**2050**	**35%**	**35%**	**35%**		

***Projected cuts**

In the chart above, I propose a halving of the emission reductions currently required by the Kyoto Protocol for industrialized nations. We realize that this may not be an optimal choice from an environmental perspective. However, in light of the stiff U.S. domestic political opposition to the Kyoto Protocol, modification of the reduction requirements may be the only way to move forward on a global scale. By halving the emissions cuts currently required by the Kyoto Protocol for industrialized nations, and by creating a timetable of binding reductions for developing nations, we are providing an incentive for the U.S. to commit to Kyoto. It is my belief that ratification of a watered-down Kyoto Protocol (for the near-term) is preferable to no agreement at all.

Smith, L. *The World in 2050: Four Forces Shaping Civilization's Northern Future*, Dutton, 2010.

The percentages required for developed nations are based on the 1990 levels, whereas for developing nations, the percentages are based on the 2000 levels. We are aware that this would only be possible through technology transfer from developed to developing countries.

This amended Protocol will give more time to tackle the climate change problem properly and in a more effective way. As was stated earlier in the article under the options that we have under the current situation, we need a longer time-frame since the U.S., a leading and major player, is not willing to make the economic sacrifice required by the Kyoto Protocol. Therefore, there is a need to expand the time-frame (or immediate deadline) so that the U.S. is convinced of a feasible means of improving the global warming situation. Reducing the level of emissions is a must if the international community really wants to find a fair solution to climate change. As it stands now, countries are very far from solving the climate change problem. Therefore, there is a scientific need to be more demanding if the international community really wants to solve, or at least not worsen, the threat of climate change.

There would be a direct opposition from some NGOs to this proposition, since they request immediate action. Other NGOs would agree to see the inclusion of developing countries in the fight against climate change.

6. Greater role of environmental NGOs to shape environmental public opinion. This depends very much on what part of the world we are referring to. Some NGOs have tremendous access to the media and can, therefore, be more influential. The global warming issue should be tackled with a short- and long-term view and with an

[285] The percentages for China (and the rest of developing countries) are based on the 2000 levels.

international/domestic approach. International enforcement of environmental agreements is almost impossible. So a solution could be through domestic enforcement. In other words, one should aim at making environmental problem-solving a competence of the domestic, and not international, sphere. In fact, public opinion is increasingly taking note of the accumulating evidence of global warming. However, global warming is still perceived in an abstract way. To make it more concrete, one could raise awareness of ways in which climate change will affect people. For example, if there is no action, there will be no more snow in the mountains in the near future and therefore, no more skiing in ski resorts. It is important that large companies and NGOs continue to raise public awareness, which will put pressure on decision-makers to be supportive of environment-protection policies. NGOs have helped to create an atmosphere of expectations, strong feelings and emotions, and have added dynamism to the process.

7. Give countries credit for maintaining and preserving their forests and for reforestation because trees absorb CO2. The U.S. wants to apply this policy, but the EU disagrees on the grounds that the U.S. would get away from the Kyoto Protocol requirements too easily and the EU would be in an unfavorable position since the EU has no more large zones of forests. This system would undermine the whole point of the Kyoto Protocol, which is to spur humans into action to control GHG emissions.[286] However, the G.W. Bush administration disagreed with the statement that the whole point of the treaty is to spur action by humans to control GHG emissions since it believed that the point of the treaty is to reduce global atmospheric concentrations of GHG emissions. One way to get there is by reducing emissions. Another way is to increase the

[286] Article 2 of the Kyoto Protocol.

sequestrations of GHG emissions by, for example, forests. Focusing *solely* on emissions invites us to overlook an equally important part of the equation, and reducing emissions *alone* won't solve the problem. There is much that can be done on the side of carbon sequestration too.

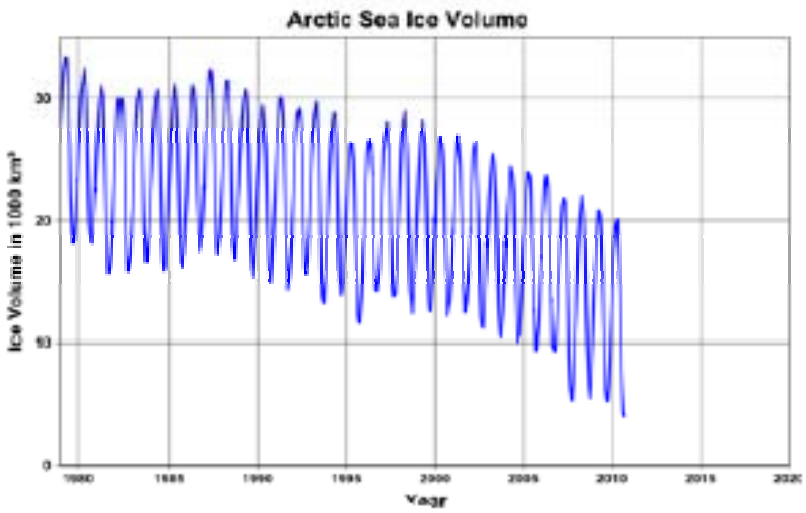
8. Find new market mechanisms. The solution should be not only technological but we should also look into market mechanisms to find the most cost-effective way to find a solution to climate change. The idea is to develop market incentives to make emission reductions happen more quickly.

9. People and ecosystems will need to adapt to future climate regimes. Past and current emissions have already changed the Earth's climate in the 21st century. For example, projections for 2100 suggest that temperature in Europe will have risen by between 2 to 6.3 degrees Celsius above 1990 levels.[287]

Moreover, in 2007 the IPCC conducted several statistical researches to assess the uneven change in the climate during the past century. It revealed several trends that are likely to be linked to human activity and in particular GHG emissions. These trends can be summarized as followed: from 1906 to 2005, the global average temperature rose by 0.74°C.[288] In particular, in that period of time, eleven of the last twelve years (1995-2005) ranked among the warmest years in the instrumental record of global surface temperature (since 1850).[289] The rise in temperature seems to be greater in the northern areas of the globe.[290] In the same way, sea level rose on average at a rate of 1.8mm per

[287] European Environment Agency, "Vulnerability and adaptation to climate change in Europe," Report No. 7/2005, 2006, p. 6.
[288] IPCC, "Climate Change 2007: Synthesis Report," p. 30, 2007, available at http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf.
[289] Ibid.
[290] Ibid.

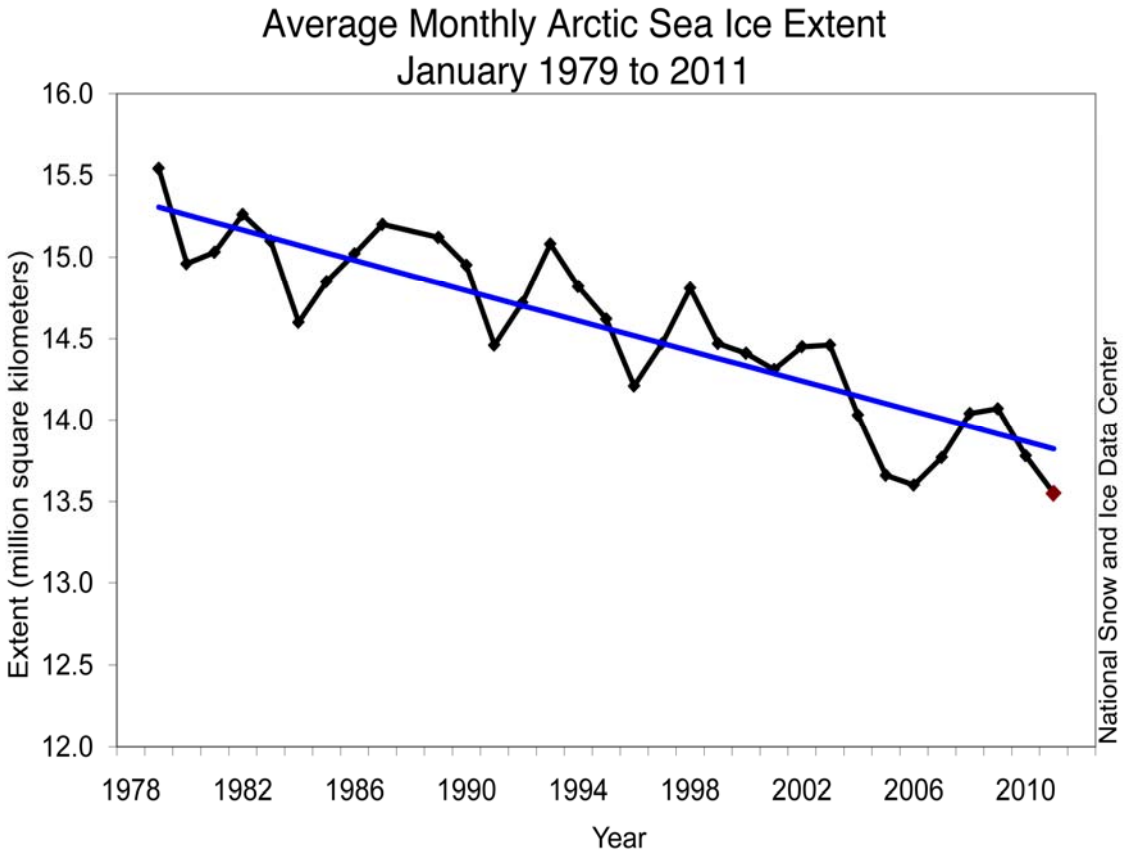
year between 1961 and 2003, and at a rate of about 3.1mm from 1993 to 2003.[291] This is connected to a progressive shrinking of snow and ice extent, as demonstrated in the chart below:[292]



Source: Polar Science Center, University of Washington

As shown in the chart below, since 1978, the annual average Arctic sea ice extent has decreased by 2.7 per cent per decade, especially in summer.[293] Accordingly, mountain glaciers and snow cover have declined in both hemispheres.

[291] Ibid.
[292] Ibid.
[293] Ibid.



Finally, from 1900 to 2005, precipitation increased significantly in the eastern parts of North and South America, northern Europe as well as northern and central Asia, whereas precipitation declined in the Sahel, the Mediterranean, southern Africa, and parts of South Asia.[294]

Adapting to these effects will require a good understanding of socio-economic and natural systems, their sensitivity to climate change and their inherent ability to adapt. Many strategies are available for adapting to the expected effects of climate change.

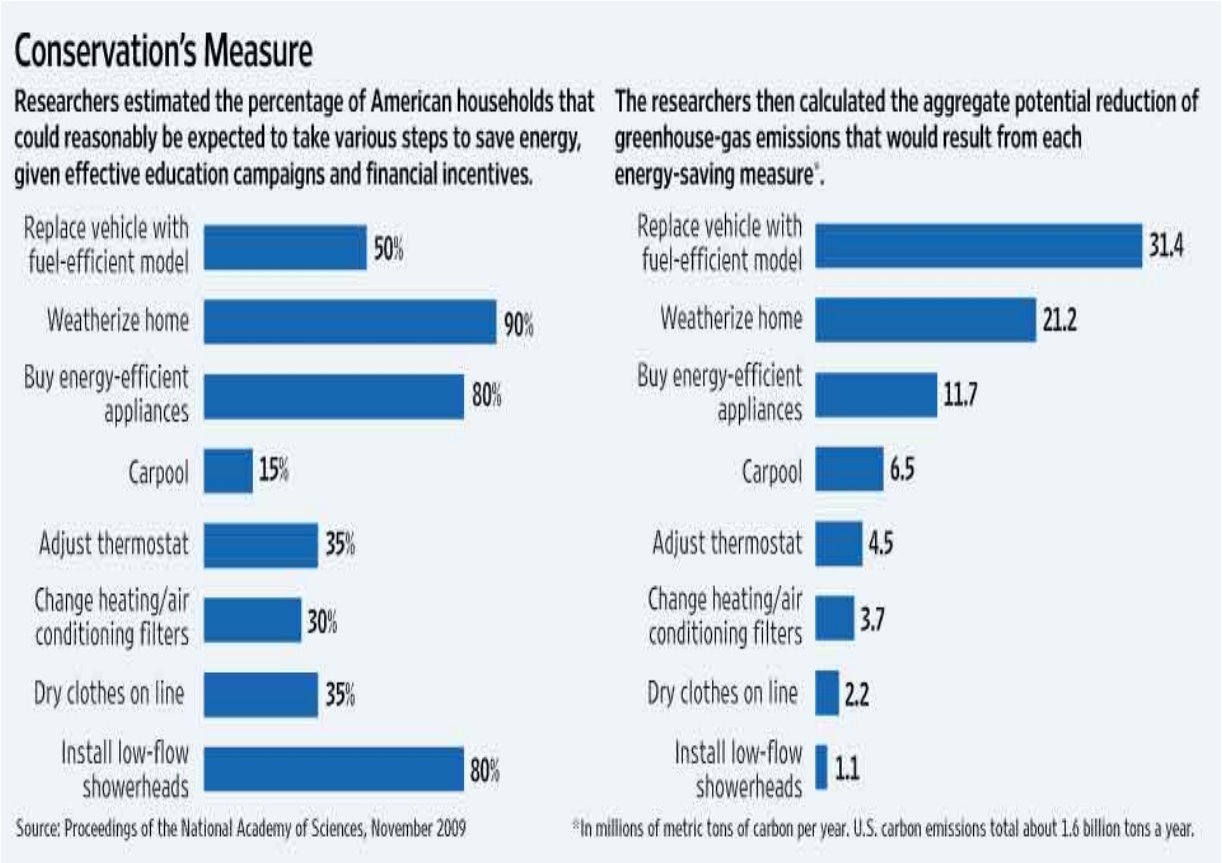
10. Preventive instead of curative approach. Many options for limiting emissions are available in the short- and medium-term. What matters is whether the world can work

[294] Ibid.

out a long-term response to a threat that will gradually rise throughout the coming years. The longer it takes to react, the worse the situation gets and the more expensive it becomes to repair it.[295] Policymakers should, therefore, encourage energy efficiency and other climate-friendly trends in both the supply and consumption of energy. Key consumers of energy include industries, homes, offices, vehicles, and farms. Efficiency can be improved by providing an appropriate economic and regulatory framework for consumers and investors. This framework should promote cost-effective actions, the best current and future technologies, and "no regrets" solutions that make economic and environmental sense, irrespective of climate change.

Changes in practices and lifestyles, from better urban transport planning to personal habits such as turning off the lights, to adjusting the thermostat, to changing air conditioning filters, to buying energy-efficient appliances, to weatherizing homes, are also important. For example, in the case of the U.S., the chart below shows on the left the percentage of households that could be expected to take several steps to save energy, based on financial incentives and education campaigns. On the right, the chart shows the aggregate potential reduction of GHG emissions resulting from each energy-saving measure mentioned on the left side of the chart. This demonstrates that the current level of GHG emissions can be reduced significantly by simply changing our lifestyles.

[295] The *Stern Review on the economics of climate change* (2006) provides an economic analysis of the disastrous consequences of climate change. Available at http://bit.ly/8lIivV.



Countries should also cooperate with each other and learn from more experienced societies in the fight against climate change protection. For example, the Netherlands has centuries of experience of protecting themselves against water. They are working out how to adapt and build infrastructure to minimize the risks of flooding because of the rise of sea levels.[296]

11. Reducing uncertainties about climate change, its impacts, and the costs of various response options is vital. The prudent response to climate change is to adopt a portfolio of actions aimed at controlling emissions, adapting to impacts, and encouraging scientific, technological and socio-economic research.

[296] "How to Live with Climate Change," *The Economist*, 27 November 2010, p. 13.

12. Better use of current UN agencies through political commitment. The international community should aim at a stronger United Nations Environment Program (UNEP) enforcement and providing more authority to the United Nations in order to oversee Treaty compliance instead of creating new intergovernmental organizations to deal with global warming, such as the World Environment Organization (WEO).

13. Efficient regulatory mechanisms on energy-consuming products. We should promote regulations on air conditioners, for example. The G.W. Bush administration's decision to reduce air conditioner efficiency goals in 2001 was a senseless reversal.