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A U.S.-Centric Chronology of the United Nations Framework Convention on Climate Change

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Summary

The November 2013 negotiations in Warsaw are the most recent in a series aimed at arranging multilateral cooperation to address climate change. The United Nations launched formal international negotiations in 1990 to respond to growing scientific and public concern about human-induced emissions of greenhouse gases (GHG), principally carbon dioxide. This report chronicles the main milestones and issues in the United Nations process to address climate change.

The 1992 United Nations Framework Convention on Climate Change (UNFCCC): Governments agreed in 1992 to the *United Nations Framework Convention on Climate Change* (UNFCCC), which continues to provide the principle—but not sole—framework for global cooperation on the issue. The treaty's objective is to stabilize GHG concentrations in the atmosphere at a level that would prevent dangerous human-induced interference with the Earth's climate system. A 2010 political statement interpreted this as a vision of GHG cuts to prevent global average temperature from increasing more than 2°C (2.6°F) above pre-industrial levels.

The United States, as a Party to the UNFCCC, has qualitative obligations to report national GHG emissions; cooperate on science and technology development; enact programs to abate emissions; and provide agreed new and additional financial resources to assist low-income countries to mitigate and adapt to climate change. When the UNFCCC was drafted, the then-industrialized countries emitted two-thirds of annual GHG emissions (excluding emissions from deforestation). These *Annex I* countries correspondingly accepted a lead role in abating GHG emissions, though all countries agreed to "common but differentiated responsibilities."

The 1997 Kyoto Protocol and its 2012 Doha Amendment: When UNFCCC entered into force in 1995, Parties agreed that enforceable obligations were necessary to prevent "dangerous climate change." The 1995 Berlin Mandate called for a new protocol by 1997 with "no new commitments for developing countries" Under the resulting 1997 *Kyoto Protocol*, 37 of the then-highest income countries and the European Union (EU) committed to reduce their GHG emissions on average to 5% below 1990 levels during the "first commitment period" of 2008 to 2012. The United States signed but did not become a Party to the Kyoto Protocol. The 2012 *Doha Amendment to the Kyoto Protocol* established a second commitment period of the Kyoto Protocol for the period 2013-2020, with GHG abatement pledges from 37 countries plus the EU. Japan, New Zealand, and the Russian Federation declined to participate in the Doha Amendment to the Kyoto Protocol. Canada withdrew from the Kyoto Protocol in 2012.

The 2010 Cancun Agreement: In 2010 for the first time under the UNFCCC, a negotiated agreement contained language for GHG pledges by all major emitting Parties. Many Parties, including China, pledged quantitatively to limit their GHG emissions. However, these pledges are not considered "legally binding."

Currently, the Durban Platform Negotiations: The current round of negotiations is the *Durban Platform for Enhanced Action*. The *Durban Platform's* mandate is for a new agreement "with legal force" that would be "applicable to all Parties" and begin implementation after 2020. In concept, this mandate could eliminate the bifurcation in the UNFCCC between *Annex I* and *non-Annex I Parties*, or between countries with and without binding GHG obligations.

Issues for Congress: Many in Congress are concerned with the merits of a treaty, and with the goals and obligations it might embody. One concern is the compatibility of any international agreement with any U.S. domestic policies and laws, should consensus emerge on whether and how to address climate change. Additional issues include the costs and other impacts of obligations; the parity of actions among countries and effects on trade competitiveness; the adequacy of appropriations, fiscal measures, and programs to achieve any commitments under the agreement; and the desirable form of the agreement and related requirements. A new treaty would require Senate consent to ratify it as well as possible federal legislation to meet any U.S. commitments.

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Background on the International Climate Change Negotiations

Members of Congress hold diverse views about the value of international cooperation to address climate change. While some Members are convinced that human-induced climate change is a high priority risk that must be addressed through federal actions and international cooperation, others are not convinced of significant risk. Some are wary, as well, of international processes that could impose costs on the United States, undermine national sovereignty, or lead to trade advantages for other countries. The United States government has participated for more than two decades in various multilateral negotiations and actions aimed at addressing climate change. This report surveys the United Nations negotiations, from a primarily U.S. perspective. A table at the end of the report summarizes the chronology (**Table 1**).

Formal international negotiations were launched in December 1990 to address growing scientific and political concern about human-induced climate change. The negotiations on the 1992 United Nations Framework Convention on Climate Change (UNFCCC) marked the progress of decades of scientific research. Scientific conclusions—with uncertainties—have remained stable over two decades: greenhouse gas (GHG)[1] emissions from human-related activities are very likely causing the major portion of climate change observed in recent decades. If changes continue, they could lead to adverse impacts on human societies and their environment, potentially including catastrophes.[2] Predicting the timing, magnitude, and implications of change remains imprecise; many uncertainties may not be resolvable in a time frame consistent with making effective and efficient decisions to reduce the risks of climate change.

The question of how to share any effort to address climate change has been a core challenge for international cooperation. Because emissions come from all countries, only concerted reductions by all major emitters can stabilize the rising GHG concentrations in the atmosphere. The United States historically has contributed the most—almost one-fifth of the rise of GHG concentrations since the Industrial Revolution. In 2007, however, China surpassed the United States as the leading emitter of GHG annually. In the future, the greatest growth in GHG emissions is expected from industrializing countries, such as China, India, and Brazil. These countries historically have contributed less, and still emit much less per person, than the United States and most other high-income countries. Arguably, the least developed and still industrializing nations have lower

[1] "Greenhouse gases" are defined in the United Nations Framework Convention on Climate Change as "those gaseous constituents of the atmosphere, both natural and anthropogenic [human-driven] that absorb and re-emit infrared radiation." They may alter the composition of the atmosphere, changing the balance of radiation entering and leaving the Earth system, and consequently change the temperature or patterns of climate on Earth. The most important is water vapor, but it is believed not to be altered by human activities. Carbon dioxide (CO_2) is the most important human-related GHG, with about ¾ coming from fossil fuel use and about ¼ due to land use change and forestry. Other important gases listed under the Kyoto Protocol are methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFC), perfluorocarbons (PFC), and sulfur hexafluoride (SF_6). Additional greenhouse gases are partially controlled internationally under the *Montreal Protocol* of the Vienna Convention for the Protection of the Ozone Layer, including chlorofluorocarbons (CFC) and hydrochlorofluorocarbons (HCFC), etc., while discussion of addressing others is emerging (e.g., nitrogen trifluoride (NF_3). Other radiatively important substances are significant but difficult to treat similarly, such as aerosols or tropospheric ozone. These latter substances have not (yet) been addressed by the UNFCCC.

[2] For more information on climate change science and impacts, see CRS Report RL34266, *Climate Change: Science Highlights*, by (name redacted).

economic and governance capacities to address the problem. The size of effort and how to allocate it is a key element of negotiations.

The primary issues for negotiation in 1990 remain the same today:

- when and by how much to reduce greenhouse gas emissions globally in order to achieve the UNFCCC's objective of avoiding "*dangerous anthropogenic interference with the climate system*";[3]
- how to share "*common but differentiated responsibilities*" among countries taking into account "*historic contributions*" and "*respective capacities*" of different people—in particular, the acceptable degree of participation of low-income countries;
- what mechanisms are best suited to assuring GHG reductions at the lowest cost, respecting national sovereignty and supporting "*sustainable economic development*" and "*the eradication of poverty*";
- how cooperatively to understand the risks and facilitate adaptation to climate changes, especially by those people least able to cope on their own; and
- how to adapt international arrangements over time as science, social conditions, and capabilities evolve.

At present, the United States is one of three of the 194 Parties to the UNFCCC that is not also Party also to the subsidiary Kyoto Protocol. (The other two are Canada[4] and Andorra.) As a Party to the UNFCCC, the United States has general obligations to reduce its GHG emissions, report its emissions and be subject to international review, and assist lower-income countries, and other binding commitments. The industrialized Parties to the Kyoto Protocol (*Annex I Parties*), however, took on binding, quantitative commitments to reduce their GHG emissions to 5% below 1990 levels during 2008-2012 and agreed in 2012 to reduce these further during a second commitment period from 2013 to 2020.

Most Parties have made voluntary pledges to GHG reduction targets or *nationally appropriate mitigation actions*[5] under the 2009 Copenhagen Accord and the 2010 Cancun Agreements. Nonetheless, many *non-Annex I Parties*[6] have opposed taking on legally binding commitments to abate GHG emissions. Many *Annex I Parties* have opposed taking on further legally binding commitments without participation by all Parties. The 2011 Durban Platform envisioned an end to two-track (developed versus developing) negotiations and provided a mandate to negotiate by

[3] This report introduces and puts in italics, in their first usages, certain terms and phrases used particularly in international climate change negotiations, to alert the reader to their significance.

[4] Canada withdrew from the Kyoto Protocol in December 2012.

[5] *Nationally appropriate mitigation actions*, or NAMAs, is a term referring to the set of policies, programs, or other actions that non-Annex I (NA1) Parties (i.e., those not listed in Annex 1 of the UNFCCC, and generally lower income countries) should identify to mitigate their GHG emissions. Parties that see international support for NAMAs must record them in a registry and be subject to international measurement, reporting, and verification, according to the Copenhagen Accord.

[6] Non-Annex I Parties were generally the lowest income countries when the UNFCCC was negotiated. In the period since, many of these countries have become middle- or high-income countries. Political disagreement has obstructed revision of the allocation of efforts to reflect better current socio-economic circumstances and capabilities or long-term effectiveness of the arrangements.

2015 a single outcome "with legal force" applicable to all Parties and that would take effect after 2020.

How to pay for GHG reductions and adaptation measures is another key issue. The wealthiest Parties (including the United States) pledged "fast start" financing approaching $30 billion[7] during 2010-2012, and a goal of mobilizing financing of $100 billion annually by 2020. Funding will come from public and private, bilateral and multilateral, and alternative sources. The *most vulnerable* developing countries had priority for the 2010-2012 funds. Reportedly, the fast-start financing goal was exceeded, but the pathway to meeting the 2020 pledge remains obscure.

This report summarizes the process and principle issues and outcomes of the international climate change negotiations since 1990. Further, CRS has produced a series of reports on many aspects of the international climate change negotiations (and domestic issues) that can be accessed through the CRS website (http://www.crs.gov/Pages/clis.aspx?cliid=2522) or by contacting CRS Inquiry at 7-..... This report summarizes the principal events and agreements, followed by a chronology at the end.

The United Nations Framework Convention on Climate Change (1992)

The international negotiations launched in 1990 culminated in the 1992 adoption of the United Nations Framework Convention on Climate Change (UNFCCC) in Rio de Janeiro, Brazil. The U.S. Senate quickly gave its advice and consent,[8] leading the United States to be the fourth nation to ratify the UNFCCC—the first among industrialized countries. As of November 1, 2013 195 governments were Parties[9] to the UNFCCC. As a framework convention, this treaty provides the structure for collaboration and evolution of efforts over decades, as well as the first qualitative step in that collaboration. The UNFCCC does not, however, include measurable and enforceable objectives and commitments.[10]

The UNFCCC originally listed 35 of the most industrialized nations (including the United States) plus the European Economic Community (now the European Union, or EU) in Annex I.[11] These *Annex I Parties* accepted specific commitments, particularly to take the lead in adopting national policies and undertaking measures with an aim to reduce human-related greenhouse gas (GHG)[12]

[7] Developed countries are invited to report by May 2011-2013 on resources provided and the ways in which developing countries access these resources.

[8] Treaty Doc. 102-38, S. Exec. Rept. 102-55.

[9] A nation or regional economic integration organization (e.g., the European Union) that ratifies, accepts, approves, or accedes to the treaty and deposits the relevant documents with the Depositary becomes a *Party* to the treaty. (Different nations have different processes for joining treaties.)

[10] The commitment by industrialized Parties to prepare national action plans aiming to reduce GHG emissions to 1990 levels is measurable, but no effective penalties or mechanisms were established to address any non-compliance with obligations.

[11] As of January 2012, there are 42 Annex I Parties. In general, there has been resistance to amending Annex I so that nations "graduate" into greater commitments as their incomes rise. For example, Mexico, Korea, and Israel are now members of the Organization for Economic Cooperation and Development (OECD), an organization of the wealthiest market-based economies, but are not yet listed in Annex I.

[12] The UNFCCC narrowly covers human-related GHG, while the principal scientific assessment body, the (continued...)

emissions to their 1990 levels by the year 2000. Annex I Parties also agreed to submit inventories of their emissions and *sinks*,[13] and *national communications* of their UNFCCC-related policies and actions. The *non-Annex I Parties* were then low-income countries, though many are now middle- or high-income countries (e.g., Singapore). The UNFCCC also listed in *Annex II* the then-wealthiest Parties (including the United States), which committed to providing *agreed new and additional financial resources* to assist the developing country Parties[14] to meet their obligations.

By the time the treaty entered into force and the Conference of the Parties (COP) met for the first time in 1995, the Parties agreed that achieving the objective of the UNFCCC would require further, stronger, and binding GHG commitments. The 1995 Berlin Mandate for negotiations on a 1997 protocol deferred any new commitments for developing countries to later agreements.

The Kyoto Protocol (1997)

As a first enforceable step toward meeting the objective of the UNFCCC, the 1997 Kyoto Protocol promised to reduce the net GHG emissions[15] of industrialized country Parties (Annex I Parties) to 5.2% below 1990 levels in the *first commitment period* of 2008 to 2012. It also pledged to assess the adequacy of these commitments early in the new century.

The United States signed the Kyoto Protocol on November 12, 1998. In Congress, however, opposition was strong. In the "Byrd-Hagel" Resolution[16] in July 1997, the Senate expressed its opposition (95-0 vote) to the terms of the Berlin Mandate, by stating that the U.S. should not sign any treaty that does not include specific, scheduled commitments of non-Annex I Parties in the same compliance period as Annex I Parties, or that might seriously harm the U.S. economy. The Kyoto Protocol (KP) was not submitted to the Senate for ratification by President Clinton, nor by his successor, President George W. Bush. Newly elected President Bush announced in 2001 that the United States would not become a Party because the Kyoto Protocol did not include GHG commitments by other large emitting non-Annex I countries and because of his conclusion that it would cause serious harm to the U.S. economy. As of November 1, 2012, 192 governments were Parties to the Kyoto Protocol. The United States and Andorra are the only Party to the UNFCCC never to join the Kyoto Protocol, while Canada withdrew from it in December 2012.

(...continued)

Intergovernmental Panel on Climate Change (IPCC) considers all climate change, both natural and human-induced.

[13] *Sinks* are any process, activity, or mechanism which removes a GHG, aerosol, or precursor of a GHG from the atmosphere. These are also frequently called *removals*. An example of a sink is the uptake of carbon dioxide from the atmosphere by photosynthesis by plants and algae, with the storage of carbon in the vegetation and subsequent release of oxygen back to the atmosphere.

[14] Though the UNFCCC uses the terms "developed" and "developing" country Parties, it does not define them. The group of "*Least Developed Countries*" are those listed as such by the United Nations.

[15] "Net" emissions are the gross emissions minus the removals of GHG from the atmosphere by "sinks" (sequestration), particularly by growing forests and other vegetation (or prevention of release of GHG by burning or decomposing vegetation).

[16] S.Res. 98.

The Bali Action Plan and Kyoto Protocol Tracks (2007)

Negotiations following the Kyoto Protocol particularly contested differentiation of commitments and assistance to developing countries, and slowed agreement on further steps under the UNFCCC. In 2007, Parties agreed to establish two tracks for negotiation of further commitments of Parties, one under the Kyoto Protocol and the other under the UNFCCC. The first track was a mandate among the Kyoto Protocol Parties (not including the United States) to pursue an amendment to the Protocol on further commitments of Annex I Parties for the period(s) beyond the year 2012. The first commitment period runs from 2008 through 2012.

The second track was established in December 2007, when the Conference of the Parties (COP) to the UNFCCC agreed to a "Bali Action Plan" to negotiate new GHG mitigation targets for Annex I Parties, "nationally appropriate mitigation actions" for non-Annex I Parties, and other commitments for the post-2012 period. The mandates specified that the products of negotiation should be ready by the end of 2009, for decision at the 15th meeting of the COP and the fifth Meeting of the Parties to the Kyoto Protocol (CMP, or sometimes COP/MOP), in Copenhagen, Denmark. The form(s) of agreement were not clear, nor how the two negotiating tracks might converge. (As discussed later, the Durban Platform of 2011 established a mandate that ended the Bali Action Plan, with negotiations that proceed on one track applicable to all Parties.)

The Bali Action Plan framed the key items for the "Copenhagen" negotiations to address climate change beyond 2012 as

- mitigation of climate change (primarily to reduce GHG emissions or to enhance removals of carbon by forests and other vegetation "sinks");
- adaptation to impacts of climate change;
- financial assistance to low-income countries;
- technology development and transfer; and
- a shared vision for long-term goals and action.

In addition, provisions for "monitoring, reporting, and verification" (MRV) permeated the negotiations. Provisions to reduce GHG emissions from deforestation and forest degradation ("REDD+") were also pursued under the Bali Action Plan.

While the inter-sessional[17] meetings during 2008 and 2009 showed little movement, public and many diplomatic expectations were high that the United States, and perhaps China and other developing countries, would come to the Copenhagen negotiations with a new willingness to change positions and agree to (1) a second commitment period of the Kyoto Protocol with GHG targets for Annex I Parties and (2) a new instrument that would include quantitative GHG commitments for the United States and perhaps an array of non-Annex I Parties or all Parties.

[17] An inter-sessional is a meeting of a subsidiary body or another formal meeting occurring between sessions of the Conference of the Parties.

The Copenhagen Sessions and the "Copenhagen Accord" (2009)

Many experts and stakeholders around the world opined that the Copenhagen sessions in December 2009 failed, bringing the United Nations' process close to collapse;[18] others judged the meetings differently. Certainly, the Copenhagen meetings did not meet the very high expectations set by the UNFCCC Secretariat and many advocates of commitments to aggressive GHG emissions mitigation by either the Annex I or all Parties. There were practical outcomes of the Copenhagen negotiations nonetheless; these included evolving recognition of the political and economic barriers in some countries to setting aggressive international obligations that Parties are not sure to fulfill. Another was a greater focus on transparency through enhanced reporting and verification of actions in countries. The U.S. Deputy Envoy for Climate Change, Jonathan Pershing, called the Copenhagen Accord a "paradigm shift"[19] in the long-term path of the UNFCCC negotiations, from a "top-down" assignment of GHG targets to Parties to a "country-up" offering of commitments.

The Copenhagen negotiations revealed distance among many countries' "bottom lines," without ground of consensus on major issues, such as the form and structure of agreements; obligations for GHG reductions and actions; the legal nature of future commitments; and acceptable provisions for monitoring, reporting, and verification (MRV). A "Copenhagen Accord" emerged that bridged some difficult differences and identified a common *and* differentiated path forward. While most UNFCCC Parties seemed willing to adopt the Copenhagen Accord, it was blocked by Bolivia, Cuba, Sudan, and Venezuela, arguing that the closed-door deal-making violated the procedures of the United Nations Charter. Tuvalu[20] and some other nations rejected the agreement for not assuring, in their views, sufficiently deep GHG reductions. Consequently, the COP only "took note" of the text, but did not adopt it. Hence, the Copenhagen Accord was a political outcome, not a legal agreement.

The Copenhagen Accord outlines a number of key points for action on mitigation, adaptation, financing, technology, reducing emissions from deforestation, and a long-term vision of avoiding temperature increases. All of these elements have been embodied in the Cancun Agreements of December 2010 (see next section). The Copenhagen Accord also included a pledge by the wealthiest Parties to arrange "fast start" financing approaching $30 billion[21] during 2010-2012, and a goal of mobilizing financing of $100 billion annually by 2020. Funding will come from public and private, bilateral and multilateral, and alternative sources. The most vulnerable developing countries have priority for the 2010-2012 funds. These financial pledges carried into the Cancun Agreements as well.

[18] For examples, see http://green.blogs.nytimes.com/2010/10/08/the-last-u-n-climate-extravaganza/?scp=1-b&sq=climate+negotiations+United+Nations&st=nyt.

[19] Jonathan Pershing, *What Happened in Cancun and Where Do the Climate Negotiations Go from Here?*, presentation at the Center for Strategic & International Studies, Washington DC, January 5, 2011.

[20] Tuvalu is a small nation of Polynesian islands in the Pacific Ocean that perceives its continued existence to be threatened by global warming-driven sea level rise.

[21] Developed countries were invited to report by May 2011-2013 on resources provided and the ways in which developing countries access these resources.

The Copenhagen Accord seemed a weak but generally agreed instrument. Following the terms of the pact, by the end of 2010, 114 Parties to the UNFCCC had associated themselves with the Copenhagen Accord, and 42 Annex I Parties and EU Member States[22] had submitted *quantified economy-wide emissions targets* for 2020.[23] Thirty-five non-Annex I Parties submitted *nationally appropriate mitigation actions* (NAMAs). Another 42 non-Annex I Parties associated themselves formally with the Accord (and were listed in the Accord as such). Some of those that submitted actions or targets did not associate with the Accord. Cuba, the Cook Islands, Ecuador, Kuwait, and Nauru formally notified the UNFCCC Secretariat that they would not associate or engage with the Accord.[24]

The Cancun Agreements (2010)

Meetings in 2010 suggested that some Parties might retreat from pledges made in the Copenhagen Accord. Notably, several low-income countries reemphasized the two-track, pre-Copenhagen texts from the 2007 Bali meetings, rather than the single text of the Copenhagen Accord. Nevertheless, the government of Mexico, as host of the December 2010 meeting in Cancun, facilitated inclusive and transparent deliberations, restoring the confidence of some Parties in the negotiations process, and which yielded several decisions of the Parties collectively called the "Cancun Agreements" (CA).

To a large degree, the Cancun Agreements reiterated elements already included in the UNFCCC, the Bali Action Plan, and the Copenhagen Accord. The Cancun Agreements continued the two tracks of negotiations toward post-2012 commitments. However, they contained nearly identical language on key points in the separate decisions under the UNFCCC and the Kyoto Protocol. A few paragraphs established explicit formal linkages between the two negotiating tracks.[25] Major elements of the Cancun Agreements included the following:

- **Long-term vision for GHG mitigation:** (Only in the decision directly under the UNFCCC.) Identifies a wide variety of elements that are components of the long-term package considered necessary to address the multiple faces of climate change. States that "deep cuts" in global emissions are required "with a view to ... hold the increase in global average temperature below 2°C." Also, establishes consideration beginning in 2013 of setting a more stringent goal to avoid a temperature increase exceeding 1.5°C.
- **A Cancun Adaptation Framework and an Adaptation Committee:** Both established to promote national adaptation plans; and to prioritize and strengthen institutional capacities and disaster risk reduction strategies, research and technology development, and other country-driven actions to build social and

[22] UNFCCC, http://unfccc.int/home/items/5262.php.

[23] Not all EU Member States are Annex I Parties, but all are covered by the EU's economy-wide target. Kazakhstan is not a Party included in Annex I for the purposes of the UNFCCC, but is included in Annex I for the purposes of the Kyoto Protocol.

[24] The UNFCCC provides access to the communications of Parties related to the Copenhagen Accord at http://unfccc.int/home/items/5262.php.

[25] However, the first paragraph of the text from the AWG-LCA (the negotiating track directly under the UNFCCC) states that "nothing in this decision shall prejudge the prospects for, or the content of, a legally binding outcome in the future."

ecological resilience to climate change. The work program may consider options for risk management, including development of a climate risk insurance facility.

- **Parallel GHG mitigation by Annex I and non-Annex I Parties:** Notes GHG mitigation targets for 2020 reported by Annex I Parties, and nationally appropriate mitigation actions (NAMAs) to be implemented by Non-Annex I Parties[26] and communicated to the Secretariat by them, compiled in public documents to be issued by the Secretariat. Further reporting and analysis will clarify the assumptions and implications for the reported targets and actions.[27]
- **A registry on NAMAs:** To record and update information on actions for which countries are seeking support; support available for NAMAs; and support provided for NAMAs.
- **Enhanced reporting by Annex I Parties and international assessment:** Requires reporting of emissions and removals related to GHG commitments, and to financial, technology, and capacity-building support provided by them.
- **Transparent reporting and international review of Non-Annex I Parties' mitigation while respecting national sovereignty:** Non-Annex I Parties must submit National Communications every four years, with biennial updates to include national GHG inventories and mitigation actions, needs, and support received. Domestic actions will be subject to domestic *monitoring, reporting, and verification* (MRV) in accordance with future guidelines. A process for *international consultations and analysis* (ICA) of biennial reports will be non-intrusive, non-punitive, and respectful of national sovereignty. Mitigation actions (as well as technology, financing, and capacity-building) supported by international finance will be subject to international MRV.
- **Reducing Emissions from Deforestation:** Requests countries to reduce carbon losses from land uses, including REDD+,[28] and to enable mobilization of supportive international financing. Requests the AWG-LCA to explore financing mechanisms for implementing "results-based actions" to reduce emissions from deforestation and forest degradation, conserve and enhance forest carbon stocks, and to manage forests sustainably. With provision of adequate and predictable support, developing countries would develop forest and carbon reference levels and transparent national forest plans and safeguards monitoring systems. "Results-based actions" should be "fully measured, reported, and verified."
- **Consideration of market-based mechanisms:** Permits further consideration of emissions trading to assist developed country Parties to meet part of their GHG commitments, to supplement their domestic actions, to maintain and build on those under the Kyoto Protocol.

[26] The Copenhagen Accord contained a provision, not present in the Cancun decisions, that Least Developed Countries and small island developing states become a new mitigation grouping that may identify actions voluntarily and with financial support.

[27] Several estimates suggest that GHG commitments have been made by countries contributing roughly 80% of current GHG emissions.

[28] "REDD+" is Reducing Emissions from Deforestation and Forest Degradation plus enhancing carbon sequestration.

- **A commitment by developed countries to mobilize finance for adaptation, mitigation, technology, and capacity-building:** Pledges approaching $30 billion[29] during 2010-2012, and a goal of $100 billion annually by 2020.[30] Funding will come from public and private, bilateral and multilateral, and alternative sources. The most vulnerable developing countries had priority for the 2010-2012 funds.
- **A Green Climate Fund (GCF):** The GCF is governed by a board of 24 representatives, equally from developed and developing countries, to channel a significant share of new multilateral funding for adaptation and mitigation.[31] The GCF is accountable to the COP, and is assisted by a new Standing Finance Committee. A Trustee (for at least three years the World Bank), accountable to the GCF Board, manages the financial assets, maintains records and prepares statements according to fiduciary standards.
- **A Technology Mechanism:** To support actions on mitigation and adaptation, accountable to the COP, composed of a standing, expert Technology Executive Committee and a Climate Technology Center (CTC) and Network.[32] The CTC is intended to facilitate assistance by the Network at the request of a developing country Party. Intellectual property controversies are not addressed.
- **Review by the COP of the long-term global goal:** Starting by 2013 and ending by 2015, to lead to "appropriate action based on the review."

The Decision of the Parties to the Kyoto Protocol took note of the GHG reduction pledges of the Annex I Parties in accordance with the Copenhagen Accord. The Decision under the Kyoto Protocol did not set a new deadline to conclude extension of the Protocol, only agreeing that it should be "as early as possible and in time to ensure that there is no gap between the first and second commitments periods."[33] Japan, Canada, and others announced that they would not participate in an extension of the Kyoto Protocol, and that they would consider only an agreement that includes GHG mitigation requirements of all major emitters (including the United States). The absence of commitments from the top three global GHG emitters (China, the United States, and India) was a matter of consternation among many delegations and stakeholders.

The Cancun Agreements marked a tentatively renewed confidence of many in the United Nations process. Many, though, watched the development of rules and guidelines, and degree of follow-through by countries on their pledges, as measures of success of the global process. Many,

[29] Developed countries were invited to report by May 2011-2013 on resources provided and the ways in which developing countries access these resources.

[30] The language in the Copenhagen Accord, linking financing to "meaningful mitigation actions and transparency on implementation," was dropped in the CA, although the CA provides explicit requirements for monitoring, reporting, verification, review, and international assessment that cover the intended and monitored results of actions by developing countries (para. 52-66 and 77).

[31] The GCF is intended to channel funds for mitigation, capacity-building, and other types of assistance and projects, though these are not identified explicitly in the main CA text. Annex III, containing the Terms of Reference for the GCF, identifies achieving a "balanced allocation between mitigation and adaptation."

[32] With establishment of this Technology Mechanism, the COP also decided to eliminate the existing Expert Group on Technology Transfer.

[33] CMP, Draft decision [-/CMP.6], "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," available at http://unfccc.int/files/meetings/cop_16/application/pdf/cop16_kp.pdf.

simultaneously, turned toward other domestic, bilateral, and multilateral institutions and processes, such as the development banks, the Major Economies Meetings, and private fora, as possibly more effective supplements or alternatives to the UNFCCC processes. Additionally, the experiences of the Copenhagen and Cancun processes, and their outcomes, marked an increase in attention to national and sub-national efforts to address climate change, relative to the attention and credence given to international negotiations.

COP 17 in Durban, South Africa (2011)

Among the decisions made by Parties at COP 17 in Durban, South Africa[34] were two of particular note: (1) an agreement to a second commitment period (CP2) of the Kyoto Protocol, and (2) a mandate, the *Durban Platform for Enhanced Action* (DP), to negotiate by 2015 a new agreement "with legal force" that would be "applicable to all Parties", to begin implementation after 2020.

Agreement on a new commitment period for GHG abatement under the Kyoto Protocol proved key to gaining consensus on the Durban Platform. Notably, delegations from China, India, and some other middle-income countries insisted that the highest-income Annex I Parties must meet their existing GHG reduction obligations and sign up to further reductions under the Kyoto Protocol. They also sought continuation of the Clean Development Mechanism of the Kyoto Protocol, through which non-Annex I Parties could sell GHG reduction credits. On the other hand, Canada, Japan, and Russia stated they would only consider an agreement that includes GHG reduction commitments from all major emitters (i.e., including China, the United States, and others).[35] The EU, ultimately pivotal in the compromise, agreed to a second commitment period of the Kyoto Protocol only in conjunction with a decision to set out a clear roadmap to a new agreement that would include legally binding GHG reductions for all major emitters.

In concept, the Durban Platform mandate could eliminate after 2020 the bifurcation of countries into "developed" or "developing." It remains to be seen whether Parties will adopt new approaches or fall back on positions that have been in stalemate for many years.

Following up on other aspects of the Cancun Agreements, Parties also decided on

- the governing instrument for the Green Climate Fund (launched in 2012) to help finance mitigation and adaptation measures in low-income countries;[36]
- a technology expert panel, modalities of the Technology Executive Committee, and criteria and a process for selecting the host of the new Climate Technology Centre—the center of a global network of technology centers;
- methods to establish reference levels against which to measure avoided deforestation as a basis for market payments, rules to count reductions from peatlands, and languages on reporting safeguards for indigenous people and other concerns with REDD+ projects; and

[34] For more detail on the Durban meeting, see CRS Report R42101, *International Climate Change: What to Expect at the Durban Conference, December 2011*, by (name redacted).

[35] The United States, which declined to ratify the Kyoto Protocol, has no quantitative and binding GHG commitments.

[36] See CRS Report R41889, *International Climate Change Financing: The Green Climate Fund (GCF)*, by (name redac ted).

- guidelines for biennial reports by Parties, procedures for "international assessment and review," "international consultation and analysis," and other actions to increase the transparency of countries' emissions-cutting actions.

COP18 and the Doha Climate Gateway (2012)

The 18th session of the COP and the 8th Session of the CMP produced a set of decisions collectively dubbed the *Doha Climate Gateway*. The agreements formally closed processes under the *Bali Action Plan* (2007), such as the *Ad Hoc Working Group on Long-Term Cooperation* (AWG-LCA) and the *Ad Hoc Working Group on the Kyoto Protocol* (AWG-KP). These processes have given way to new paths forward focused

1. under the UNFCCC, on
    a. implementation of past agreements, and
    b. the search for a future accord to be hammered out by the *Ad Hoc Working Group on the Durban Platform for Enhanced Action* (ADP);
2. under the Kyoto Protocol, on adoption of the Doha Amendment, which established a second commitment period for GHG targets from 2013-2020, covering 37 countries and the European Union, and requiring reductions of GHG emissions to, on average, 18% below 1990 levels.

These are detailed below.

In addition, the Parties to the UNFCCC continue to operate without rules on voting. As a result, decisions must be made by consensus (without objection). This is increasing seen by some as a problem for further progress under the UNFCCC, as any one Party may block an agreement. For the second time in UNFCCC history, the Chair gaveled adoption of a decision over the objections of a Party (see Bolivia's experience in discussion of the *Cancun Agreements*). The Chair announced adoption of the Doha Amendment with language restricting sales of surplus AAUs over a delegation trying to object. This incident has raised questions about whether and how voting and consensus may evolve.

1. Actions Under the UNFCCC

1.a. Implementing Past Decisions Under the UNFCCC

GHG Mitigation Efforts

Past meetings produced many decisions and agreements to analyze issues, produce plans, establish institutions, and other activities generally aimed at reducing GHG emissions, including from deforestation, forest degradation, and other activities. Themes of deliberations to reduce GHG emissions include

- **Closing the "gap" between current pledges and the maximum 2°C vision:** Beyond urging countries to increase their ambition, much of the work is to clarify GHG pledges and compare them, with an eye toward encouraging all Parties to

take on "comparable" efforts. Under the 2010 *Cancun Agreements,* more than 85 Parties—both Annex I and non-Annex 1(including China,[37] India,[38] Indonesia,[39] Mexico,[40] and many others)—made non-binding pledges to abate national GHG emissions. These pledges are stated with different base years, scopes, and other conditions that make comparison and evaluation challenging. Work continues on "clarification," "common elements", "comparability", and assistance to developing countries in making pledges.

- **Supporting mitigation and adaptation actions by developing countries:** Many non-Annex I Parties are working on low-carbon development strategies and *Nationally Appropriate Mitigation Actions* (NAMAs) that address multiple policy objectives in GHG mitigation, energy supply, water management, provisions of sanitation, and social development. Work continues to prepare and carry out NAMAs, and to match these efforts to technical, financial, and capacity-building support.
- The work program on *Reducing Emissions from Deforestation and Forest Degradation, plus Conservation (REDD+)* continues to struggle with questions about how to verify and validate GHG reductions.

Finance

The COP in Doha extended the work program on long-term finance for an additional year. Discussion of a "mid-term gap" from 2012 to 2020, from the end of fast-start financing to the 2020 named in the $100 billion pledge, led to a decision encouraging developed countries to increase efforts to provide finance from 2013 to 2015. The *Standing Committee on Finance (SC)* was charged with identifying options to mobilize financial resources that are adequate, predictable, sustainable, and accessible. Industrialized countries were urged to "provide resources of at least to the average annual level of the fast-start period for 2013-15." Denmark, France, Germany, Sweden, the United Kingdom, and the EU Commission pledged as much as $8.5 billion for the period to 2015.

The SC reported that developed countries had delivered more than $33 billion in fast-start climate finance between 2010 and 2012. This was greater than the pledge for $30 billion in fast-start finance they made in Copenhagen in 2009. Many Parties and observers questioned, however, whether all the financing counted is "new and additional" or recounted financing that would have been available anyway. The SC will continue to debate proposals for taxes on international aviation, international shipping, and/or international financial transactions as possible, more reliable sources of funding than periodic, voluntary replenishments from public coffers. The SC will also prepare biennial reports assessing financial flows, and developing methods for improved reporting of financial flows.

The Green Climate Fund (GCF) moved forward. The COP agreed to a governing instrument for the Green Climate Fund (GCF) but some Parties and stakeholders expressed disappointment that

[37] China: https://unfccc.int/files/meetings/cop_15/copenhagen_accord/application/pdf/chinacphaccord_app2.pdf.

[38] India: https://unfccc.int/files/meetings/cop_15/copenhagen_accord/application/pdf/indiacphaccord_app2.pdf.

[39] Indonesia: https://unfccc.int/files/meetings/cop_15/copenhagen_accord/application/pdf/indonesiacphaccord_app2.pdf.

[40] Mexico: https://unfccc.int/files/meetings/cop_15/copenhagen_accord/application/pdf/mexicocphaccord_app2.pdf.

more progress had not been made in operationalizing the GCF. They also sought more clarity on how much money will be available in the GCF, the role of the private sector, and the balance of mitigation and adaptation pay-outs. Parties selected Songdo, South Korea, as the host of the GCF. Considerable discussion revolved around the relationship between the Governing Board and the COP.

Technology

Parties continued to discuss the roles and linkages between the Technology Executive Committee (TEC) and the Climate Technology Centre and Network (CTCN), both established in the *Cancun Agreements*. Parties continued to disagree on whether intellectual property rights should be discussed in the TEC, given that they are covered in fora other than the UNFCCC.

1.b. Negotiating the New ADP Agreement Under the UNFCCC

Parties agreed to meetings to support two "workstreams" of the ADP, relating to

1. the 2015 agreement, to take effect in 2020;[41] and
2. "pre-2020 ambition"—or increasing the reduction of GHG emissions in the period to 2020.

"Balance" has become a key concept, concerning relative priorities between the two workstreams, and among the subjects of adaptation, "enhanced ambition" in GHG mitigation, means of implementation (finance, technology development and transfer, and capacity-building), and transparency of actions and support for actions.

Decisions in Doha included several further items:

- Parties agreed to consider managing *Loss and Damage* through an institutional mechanism. Some characterize this as agreement to a process to address "loss and damage" while the United States does not contemplate participating in any arrangement based on blame or liability for past actions, including GHG emissions.
- Parties agreed to consider the possible roles of both market mechanisms and non-market mechanisms in the new 2015 agreement.[42]

[41] The 2015 agreement, as spelled out in the Durban Platform, should be "a protocol, another legal instrument or an agreed outcome with legal force applicable to all Parties."

[42] New approaches to market mechanisms: The market-based flexibility mechanisms included in the Kyoto Protocol for the first time established means for Parties to achieve their commitments more cost-effectively by allowing emissions trading in various forms. Under the KP, Parties, or entities in Party countries, may sell emission allowances or certified emission reductions to other Parties or entities; these traded allowances, or *Certified Emission Reductions* (CERs), may be surrendered to help meet emission compliance obligations.

Lessons learned from the first commitment period's experience with the market mechanisms raised concerns about credits issues that did not represent "real" emission reductions; the institutional and transactional burdens of the processes, and questions left unresolved about carrying credits over from one period to use against subsequent commitments. In addition, questions are being raised about whether market mechanisms, including insurance, may help to support actions to adapt to climate change.

Options raised by various stakeholders include decentralized approaches, such as bilateral crediting, nation-based (continued...)

- At the request of Saudi Arabia, Parties agreed to work to consider diversification of economies, suggesting a vision beyond reliance primarily on production of fossil energy.

2. The Doha Amendment to the Kyoto Protocol

The *Doha Amendment to the Kyoto Protocol* established the second commitment period, from 2013-2020 for the Kyoto Protocol, with GHG targets for 37 countries plus the EU averaging a reduction of 18% below 1990 levels. Japan, New Zealand, and the Russia Federal declined new GHG targets because all major emitters did not participate. Canada formally withdrew from the Kyoto Protocol. Because some Parties were disappointed with what they considered to be a low level of ambition for GHG reductions in the second commitment period, the Doha Amendment provided for a voluntary review in 2014 of Annex I Parties' *Quantified Emission Limitations and Reduction Commitments (QELRCs)*.[43]

The first commitment period of the KP, in 1997, covered more than 55% of the 1990 "basket of six" GHG emissions globally. The second commitment period covers approximately 15%, given the growth of emissions by a number of non-Annex I countries and without the participation in second commitment period GHG targets by the Russian Federation, Japan, and New Zealand, the United States, or Canada.[44]

The *Doha Amendment* modified several rules for the KP's second commitment period:

- Only Annex I Parties taking on GHG targets in the second commitment period may transfer and acquire emission reduction credits from the Clean Development Mechanism (CDM) and Joint Implementation, two of the three flexibility mechanisms under the Kyoto Protocol.[45]
- Parties that have not used all their Assigned Allowance Units (AAUs)[46] from the first commitment period may sell to other Parties. Nonetheless, the EU, Japan, and other countries vowed they would not acquire any, as they do not consider that the "surplus" AAUs represent real GHG emission reductions.[47]
- Disagreement continued over whether AAUs unused in the first or second commitment periods should be cancelled from 2020.

(...continued)

crediting, and/or continuing with the more centralized approach of the Clean Development Mechanism, one of the three mechanisms for emissions trading under the Kyoto Protocol.

[43] QELRCs are the GHG emission reduction commitments for countries, as listed in Annex B of the Kyoto Protocol. The term is also used with reference to new GHG commitments being negotiated under the Doha Platform.

[44] The United States never ratified the Kyoto Protocol, and Canada's withdrawal was effectuated in December 2012.

[45] For more information on the emissions trading mechanisms of the Kyoto Protocol, see CRS Report RL33826, *Climate Change: The Kyoto Protocol, Bali "Action Plan," and International Actions*, by (name redacted) or the related UNFCCC web page: http://unfccc.int/kyoto_protocol/mechanisms/items/1673.php.

[46] AAUs are the "currency" of Kyoto Protocol Parties' allowed emissions. They are tracked under the KP and may be traded among Parties to the Protocol, in a market-like system.

[47] The "surplus" AAUs are a consequence of the Russian Federation and other Economies in Transition (EITs) having generous GHG targets in the KP's first commitment period. These countries' AAUs in excess of emissions were considered, at the time, an inducement to participation as well as a mechanism to help finance actions that would reduce GHG emissions in the EITs.

Some observers have noted vagaries in the text that may create uncertainties in the likely size of credit supplies and market demand under the market mechanisms.[48]

Congressional Interests in International Climate Issues

Members of Congress may seek to monitor and provide input to the Doha Platform (ADP) negotiations, due to reach an agreement in 2015 to take effect in 2020, with a vision of avoiding a 2°C (3.6°F) increase of global average temperature above pre-industrial levels. The United States will be among the countries under most pressure also to provide financial and other assistance to low-income countries, to help them take on and adhere to commitments to GHG mitigation and adaptation.

In preparation for the 2015 ADP negotiations, Congress may wish to provide advice regarding the United States' position at summit of world leaders, to be convened by UN Secretary General Ban Ki-Moon in September 2014; he has challenged leaders to bring "bold pledges."[49]

Members of Congress hold divergent views about the value of international cooperation to address climate change. While some Members are convinced that human-induced climate change is a high priority risk that must be addressed through federal actions and international cooperation, others are not convinced of significant risk. Some are wary, as well, of international processes that could impose costs on the United States, undermine national sovereignty, or lead to trade advantages for other countries.

Regardless of current views, the United States is a Party to the UNFCCC and has certain obligations, however unenforceable, under that treaty.[50] The United States' behaviors in that context are likely to continue to draw great attention on the world stage.[51] Arguably, U.S. credibility is impaired to the degree that it has not followed through on earlier commitments, is unable to negotiate for unambiguous commitments due to lack of domestic consensus, and cannot assure others that any agreements made by an Administration would be accepted by Congress.

The Executive Branch continues international negotiations and implementation of the UNFCCC obligations. Committees of Congress engage in oversight (from home and at the international meetings), providing input to the Administration formally and informally, and deciding program authorities and appropriations for these activities. Given the continuing public and legislative debate over whether and how to address climate change, the 113th Congress may engage on the international aspects.

International cooperation would be required to curtail human-induced climate change and to facilitate successful adaptation to its projected impacts. Many U.S. legislators seek assurance of

[48] Examples include conditions for Ukraine's participation in commitments.

[49] United Nations, "Ban Ki-Moon Invites World Leaders to a Climate Summit in 2014." September 24, 2013. http://www.un.org/climatechange/blog/2013/09/24/ban-ki-moon-invites-world-leaders-to-a-climate-summit-in-2014/.

[50] CRS Report R41175, *International Agreements on Climate Change: Selected Legal Questions.*

[51] See, for example, a summary of related discussions at the annual Davos summit: http://www.physorg.com/news/2011-01-climate-focus-davos-forum.html.

comparable actions by all major emitters prior to committing the United States to actions.[52] Additional issues that may be important to Congress include the compatibility of any international agreement with U.S. domestic policies and laws; the adequacy of appropriations and fiscal incentives to achieve any commitments under the agreement; the desirable form of any agreement; and any requirements for potential ratification and implementing legislation, should a formal treaty emerge from the negotiations.

Many Members of Congress are especially attentive to questions of parity of GHG actions among major trading partners, and especially to the potential for adverse competitiveness effects if some countries do not mandate GHG reductions while others move ahead. Most other major countries (including China, Brazil, and others) are taking actions, and some are measurably altering their GHG emission trajectories.[53] The United States has taken some actions, such as establishing GHG emission limits for motor vehicles and providing fiscal incentives for energy efficiency, renewable, and other energy technologies, etc. The Environmental Protection Agency (EPA) has proposed carbon dioxide emission standards for future electric generating units as well.[54] With existing programs and regulations, and the addition of the expected EPA regulation of GHG, the Administration believes the United States will accomplish its pledge of reducing U.S. GHG emissions to at least 17% below 2005 levels by 2020. Still, the cumulative effects of measures taken may be unlikely to achieve the deep, absolute reductions of GHG emissions considered necessary by many to stabilize atmospheric concentrations or to substantially increase rates of carbon removals from the atmosphere and sequestration (e.g., by forests and agricultural activities).

Many observers have noted other risks to the U.S. economy relating to GHG abatement: some major competitors are undertaking rapid development and deployment of advanced energy technologies, justified by their domestic commitments to abating GHG emissions, enhancing energy security, reducing environmental impacts of industrial systems, and achieving additional policy objectives. Some of the countries have, correspondingly, emerged as the leading inventors and/or manufacturers of new technologies that are gaining global market shares. While fossil fuel use is unlikely to decline in the next two decades, markets for alternative technologies are expanding. Some in Congress may continue inquiries into the relationship of climate change policies to other national interests, including technological competitiveness and energy and water security.

[52] See for example, H.R. 3140, Ensure Reliable and Affordable American Energy Act of 2013, which would prohibit any regulation of carbon dioxide emissions from electric generating units unless the Administrator of the Environmental Protection Agency were to certify that countries emitting at least 80% of global (non-U.S.) carbon dioxide emissions have put into effect regulations at least as stringent, and in the same or sooner timeframe, as those under the Clean Air Act.

[53] See, for example, *post hoc* analysis of the effects of EU policies in Mantzos, Leonidas, *Quantification of the effects on greenhouse gas emissions of policies and measures*, EcoFys, December 2009; or for China, Yuan, Jiahai, Junjie Kang, Cong Yu, and Zhaoguang Hu, "Energy conservation and emissions reduction in China—Progress and prospective," *Renewable and Sustainable Energy Reviews* 15, no. 9 (December 2011): 4334-4347.

[54] EPA, Standards of Performance for Greenhouse Gas Emissions from New Stationary Sources: Electric Utility Generating Units. 40 C.F.R. Part 60. September 20, 2013.

Table 1. U.S.-Centric Chronology of International Climate Change Negotiations, 1979-2015

1979	The concentration in the atmosphere of carbon dioxide (CO_2) is about 334 parts per million (ppm), compared to pre-industrial concentrations of about 280 ppm in 1750. World emissions of CO_2 from energy use are about 18.8 billion metric tons, of which the United States emits about 26%.
	First World Climate Change Conference estimates that a doubling of CO_2 concentrations over pre-industrial levels would eventually lead to a 1.4-4.5°C (2.5-8.1°F) increase in global mean temperature (GMT), compared to an average of about 14°C (57°F).
1985	Major scientific conference in Villach, Austria, reviews decades of observations and research, and calls for policy analysis and actions to slow the rate of GHG-induced climate change.
1987	In the Montreal Protocol, 57 governments agree to phase-out production of substances that deplete stratospheric ozone. Many of these substances, such as CFCs are also powerful and long-lasting greenhouse gases (GHG), implicated in climate change.
October 1988	Experts to the Toronto Conference on the Changing Atmosphere call for a reduction of global CO_2 emissions by 20% from 1988 levels by the year 2005.
November 1988	Governments establish the Intergovernmental Panel on Climate Change (IPCC) under the joint auspices of the UN World Meteorological Organization and the UN Environment Programme, to assess climate change research for governmental decision-making.
1990	Global CO_2 concentrations in the atmosphere are about 354 ppm. Global CO_2 emissions from energy are 21.5 billion tons annually, with 72% from industrialized countries (23% from the United States). Developing countries, home to 80% of the world's population, emit 28% of global GHG emissions, and are not projected to reach 50% of the total until around 2025. Public and congressional attention is riveted by unusually severe, regional heat waves and droughts in the summers of 1986, 1988, and 1989.
1990	First Assessment Report of the IPCC concludes that human activities emit greenhouse gases (GHG) that have increased atmospheric concentrations; these may be causing observed increases in global mean temperature (GMT), and could drive future global warming. The human contribution could not be confirmed, however, for up to a decade.
1990	The United Nations General Assembly establishes the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change (UNFCCC).
June 1992	The UNFCCC opens for signature at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, Brazil. The treaty cites *common but differentiated responsibilities and respective capabilities* of all Parties, with an *objective* of *avoiding dangerous anthropogenic interference with the climate system*. It includes commitments of developed country "Annex I" Parties to establish national action plans with measures that aim (i.e., non-binding) to reduce GHG emissions to 1990 levels by the year 2000. Includes obligations for Parties listed in Annex II (including the United States) to provide technical and financial assistance, report GHG emissions, and additional obligations. The Global Environment Facility (GEF) is named the interim financial mechanism of the UNFCCC. Non-Annex I Parties have general obligations, including for GHG mitigation, adaptation planning, and reporting.
1 October 1992	The United States becomes the first industrialized nation to ratify the UNFCCC. (Treaty Doc. 102-38, S. Exec. Rept. 102-55.)
21 March 1994	Entry into Force of the UNFCCC, following ratification by 50 countries. (As of January 2011, 194 governments have ratified the UNFCCC.)
March-April 1995	In Berlin, Germany, the first meeting of the Conference of the Parties to the UNFCCC (COP-1) reviews the *adequacy of commitments* under UNFCCC Articles 4.2(a) and (b) and concludes they are inadequate. It therefore adopts the *Berlin Mandate*, initiating negotiations for the post-2000 period to strengthen the GHG commitments of Annex I Parties, but *no new commitments for non-Annex I Parties*. The COP also agrees to a Pilot Phase for Joint Implementation, and to establish two entities: the Subsidiary Body on Implementation (SBI) and the Subsidiary Body on Scientific and Technological Advice (SBSTA).

July 1997	The U.S. Senate passes (95-0) the *Byrd-Hagel Resolution* that the United States should not enter into any international agreement that does not include obligations for developing countries in the same period, or that would seriously harm the U.S. economy.
December 1997	The *Kyoto Protocol* to the UNFCCC is adopted, signed by more than 150 countries. It sets a goal of reducing industrialized countries' GHG emissions to 5% below 1990 levels during the first commitment period of 2008-2012, and lists *assigned amounts* of allowable GHG emissions by Parties in Annex B. It provides for flexibility mechanisms, including trading of assigned amounts, Joint Implementation, and the Clean Development Mechanism. It outlines a compliance mechanism, and requires reporting by Parties. Many implementing rules remain to be negotiated, covering operations of the flexibility mechanisms, how to account for land-based carbon sequestration, the nature of the compliance regime, etc. The Protocol would enter into force when 55 countries, including at least 55% of 1990 GHG emissions, have submitted papers of ratification.
12 November 1998	The United States signs the Kyoto Protocol.
December 1998	The COP agrees to the *Buenos Aires Plan of Action*, with a deadline of 2000 to finalize rules to implement the Kyoto Protocol. The United States continues to press developing countries to take on voluntary commitments to reduce GHG emissions.
1998	Sets record as highest average global surface temperature, associated with strong El Nino conditions. (Since then, 1998 has been exceeded by 2005 and 2010).
November 2000	In the Hague, Netherlands, the sixth COP discussions collapse, suspended without agreement on rules to implement the *flexibility mechanisms* in the Kyoto Protocol. Parties agree to resume talks at "COP-6bis" in July 2001.
January-May 2001	The IPCC releases its Third Assessment Report, concluding that global temperature and precipitation continue to increase, and effects can be observed in decreasing snow and ice extent, melting glaciers, altered seasonality, and other indicators of climate. The observed CO_2 concentration has not been exceeded during the past 420,000 years and likely not during the past 20 million years. Most of the observed warming over the last 50 years is likely due to the increased GHG concentrations, most of which results from fossil fuel use. Without concerted actions to abate GHG emissions, atmospheric CO_2 concentrations could rise to 540 to 970 ppm by 2100—90%-250% above the 280 ppm level in the year 1750. Associated global average temperature could rise over 1990 by 1.4° to 5.8°C (3.2°F to 14.4°F) by 2100; some regions would change more than others.
March 2001	President George W. Bush announces the United States' intention not to ratify the Kyoto Protocol.
July 2001	At COP-6bis, the United States participates for the first time as an observer, not a party to the Kyoto Protocol discussions. Decisions are made on use of the flexibility mechanisms (emissions trading, joint implementation and the Clean Development Mechanism), carbon sinks, emission penalties for non-compliance, and to establish three new financial mechanisms: the Special Climate Change Fund, the Least Developed Country Fund, and the Adaptation Fund.
December 2001	COP-7 adopts the *Marrakesh Accords*, establishing most rules and guidelines for the Kyoto Protocol to operate, especially for the three flexibility mechanisms: the Clean Development Mechanism, Joint Implementation, and Allowance Trading. To support adaptation in developing countries, agreements include: (1) replenishment of GEF to address needs of developing countries due to adverse effects of climate change or of response measures; (2) establishment of Special Climate Change Fund (SCCF) to support adaptation and technology transfer; (3) establishment of a Least Developed Country Fund (LDC Fund), with guidance on its operation; and (4) establishment of an Adaptation Fund under the Kyoto Protocol. The Parties also establish an LDC work program and the LDC Expert Group (LEG), funding for National Adaptation Programs of Action and additional implementation support.
November 2002	COP-8 issues a *Delhi Declaration on Climate Change and Sustainable Development.*
Summer 2003	Exceptional heat and air pollution in Western Europe are associated with more than 70,000 extra deaths. Scientific research indicated that global warming had at least doubled the chance of occurrence of the extreme heat wave.

30 October 2003	The first U.S. Senate vote on legislation to control GHG through a cap-and-emissions trading system, the McCain-Lieberman Climate Stewardship Act, fails (43-55), but gains more support than had been expected.
December 2003	COP-9 reaches several breakthrough decisions on credits for carbon absorption by forest sinks, as well as the Special Climate Change Fund (SCCF) and the Least Developed Countries Fund (LDC Fund).
November 2004	The Arctic Climate Impact Assessment concludes "Climate change, together with other stressors ... presents a range of challenges for human health, culture and well-being of Arctic residents ... as well as risks to Arctic species and ecosystems." Indigenous peoples link climate change impacts to human rights.
December 2004	COP-10 increases focus on adaptation and approves the Buenos Aires Programme of Work on Adaptation and Response Measures. Brazil and China submit their first National Communications to the UNFCCC.
1 January 2005	The European Union's Emissions Trading System (ETS) begins, permitting GHG allowance trading among 12 thousand companies.
16 February 2005	The Kyoto Protocol enters into force after Russia's ratification meets the requirement for ratification by Parties representing at least a 55% super-majority of CO_2 emissions (the requirement for at least 55 Parties to the UNFCCC having already been met).
2005	China announces ambitious energy efficiency and renewable energy policies.
25 June 2005	The U.S. Senate passes a Sense of the Senate Resolution (amendment to H.R. 6) calling on Congress to enact "comprehensive and effective ... mandatory, market-based limits" to slow, stop, and reverse the growth of GHG emissions, at a rate and in a manner that would not "significantly harm" the U.S. economy.
27 July 2005	The United States announces the Asia-Pacific Partnership on Clean Development and Climate (APP), to cooperate on reducing the GHG intensity of their economies through voluntary technology exchanges. The APP includes the United States, Australia, Canada, China, India, Japan, and South Korea, and includes participation by the private sector.
November-December 2005	In Montreal, Canada, the first "Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol" (CMP) meets. After the U.S. delegation walks out of the meeting, the COP agrees to two parallel tracks to consider actions in the post-2012 period, the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol (AWG-KP), and another dialogue to be established under the UNFCCC.
6 June 2006	After a week of debate, the U.S. Senate rejects (38-60) the McCain-Lieberman proposal to establish a system of tradable allowances to reduce GHG emissions in the United States.
November 2006	In Nairobi, Kenya, COP-12 and CMP-2 reach agreements concerning the Adaptation Fund, the Nairobi Work Programme on Adaptation, and the Nairobi Framework on Capacity Building for the CDM.
10 January 2007	Commission of the European Union states a new policy of limiting global warming to 2° Celsius to reduce its GHG emissions unilaterally by 20% below 1990 levels by 2020, and to 30% below if other countries join in.
February-May 2007	The IPCC releases its Fourth Assessment Report, concluding that "warming of the climate system is unequivocal" and that "[m]ost of the observed increase in globally averaged temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic GHG concentrations." By 2005, the global atmospheric concentration of CO_2 is 379 ppm, up 25 ppm since 1990, and up more than 35% over the pre-industrial level; the primary source of that increase is fossil fuel use and the second is land use change. While the United States adds about 18% of global GHG emissions, the emissions from China may have become the highest of any country.
April 2007	U.S. Supreme Court decides in *Massachusetts v. EPA* that GHG are air pollutants and that EPA must exercise the authority granted to it by the Clean Air Act to consider regulating these emissions.

May 2007	President George W. Bush initiates the Major Economies Meetings (MEM) to negotiate a new post-2012 framework among a small group of countries, to develop a long-term global goal and "to complement ongoing UN activity."
31 August 2007	In Vienna, Parties to the Kyoto Protocol agree to consider a range of GHG reduction targets of 25%-40% below 1990 levels for industrialized countries by 2020, though this range is resisted by Canada, Japan and Russia.
23 September 2007	At the first Major Economies Meeting (MEM), hosted by the United States, U.S. President George W. Bush pledges $2 billion over three years for a Clean Technology Fund (CTF) under the World Bank, expecting to raise $10 billion among donors to support concessional financing for energy projects in developing countries. Some environmental groups oppose inclusion of coal electricity in permitted project types.
December 2007	COP-13 agrees to the "Bali Action Plan"—establishes the Ad Hoc Working Group on Long-term Cooperative Action (AWG-LCA) with a mandate for Parties to the UNFCCC to negotiate toward new GHG mitigation actions and commitments in the post-2012 period and to reach agreement by the end of 2009 (at COP-14 meeting in Copenhagen, Denmark). The Bali Action Plan calls for "a shared vision for long-term cooperative action" and identifies 4 main elements: mitigation, adaptation, technology, and finance. Additional decisions place management of the Adaptation Fund under the World Bank, and initiate demonstrations and commitments to reduce deforestation.
15 May 2008	The U.S. Senate votes (55-40) that no new mandates on GHG should be enacted without effectively addressing imports from China, India and other nations without similar programs.
August 2008	In Accra, Ghana, exchange of views under the AWG-LCA continues on alternative approaches to "shared vision," mitigation, adaptation, technology and finance. Any question of differentiation among non-Annex I Parties continues to be contentious, with China and the G-77 maintaining solidarity. Some developing countries argue that the AWG-LCA and AWG-AP are not mandated to consider amendments to the UNFCCC or Kyoto Protocol, only implementation of them. Some delegations support worldwide sectoral approaches, which some developing countries argue would be inappropriate for them. Developing countries frequently call for new mechanisms for each issue, and oppose "conditionality" on financial and technology transfers (such as protection of intellectual property rights). The AWG-KP agree on a comprehensive "basket approach" to including multiple GHG in the second commitment period, and notes new groups of gases and new gases (e.g., nitrogen trifluoride) identified by the IPCC Fourth Assessment Report. It notes that the Montreal Protocol phases out production of CFC and HCFC, but not their emissions. Analysis will proceed on various "spillover" effects of mitigation actions.
September 2008	The government of Japan proposes that all Parties adopt a "shared vision" of achieving at least 50% reduction of global GHG emissions by 2050. Global GHG emissions should peak in the next 10 to 20 years. It proposes criteria for entering additional countries into Annex I (i.e., to become countries with commitments), to create comparability of efforts for GHG targets among Annex I Parties, according to sectoral emissions, efficiencies, and reduction costs, and for new GHG commitments among three groups of developing countries.
December 2008	In Poznan, Poland, a high-level segment of COP-14 witnesses political statements on a "shared vision for long-term cooperative action," and agrees to intensify negotiations. Parties agree that a full negotiating text should be available by June 2009. Parties also resolve issues regarding the Adaptation Fund, though developing countries did not achieve commitments for additional adaptation monies. The government of Mexico, among the first non-Annex I Parties to offer a GHG reduction commitment, announces a goal to halve GHG emissions from 2002 levels by 2050. Brazil pledges to cut deforestation by at least 50% by 2017.

December 2009	COP-15 and CMP-5 deliberate on multiple proposed texts without agreement, and decide to extend the negotiating mandates of AWG-LCA and AWG-KP through 2010. Key disagreements include whether the product should be two agreements (one being amendment of the Kyoto Protocol) or one merged text; whether obligations should be legally binding; and whether developing countries' mitigation actions and results should be measurable. COP-15 also "takes note of" the "Copenhagen Accord" negotiated among United States and roughly 30 countries outlining process to pledge (by February 1, 2010) national targets or actions to mitigate GHG emissions; $30 billion of financing from 2010-2012; and to seek $100 billion annually of a variety of types of financing by 2020.
29 November-10 December 2010	COP-16, CMP 6, and Subsidiary Bodies in Cancun, Mexico, resulted in Decisions to extend the two-track negotiating mandates and to adopt the Cancun Agreements. These embody the GHG mitigation pledges made by all major emitting countries in accordance with the Copenhagen Accord; enhancements to monitoring, reporting, and international review of Parties' policies and GHG emissions; pledges and mechanisms for enhanced financing of mitigation and adaptation; and new committees to increase emphasis on technological advance and on adaptation.
2010	Ends the decade of the 2000s, the warmest decade in the record of widespread, direct land and sea surface temperature measurements (since around 1850). 2010 ties with 2005 as the warmest year on record.
	Concentration of carbon dioxide in the atmosphere reaches 390 ppm, more than 40% above the pre-industrial concentration of about 270 ppm $\pm$ 10 ppm.
28 November-9 December 2011	In Durban, South Africa, CMP-7 and COP-17 respectively agree to (1) set a second commitment period of the *Kyoto Protocol*, beginning 1 January 2013, and (2) the *Durban Platform for Enhanced Action* (DP), to negotiate by 2015 a new outcome "with legal force" that would be "applicable to all Parties" and begin implementation in 2020. Parties also decided on aspects of the Green Climate Fund, the Technology Mechanism, and REDD+ for carbon sequestration in vegetation.
26 November-7 December 2012	COP-19 and CMP-9, in Doha, Qatar, adopt the *Doha Climate Gateway*. The set of decisions includes the *Doha Amendment to the Kyoto Protocol* establishing the second commitment period, from 2013-2020 for the Kyoto Protocol, with GHG targets for 37 countries plus the EU averaging a reduction of 18% below 1990 levels. Japan, New Zealand, and the Russian Federation decline new GHG targets because all major emitters do not participate. Canada ends being a Party to the Kyoto Protocol.
1 January 2013	The second commitment period of the *Kyoto Protocol* begins, ending 2020.
4-15 June 2013	Sessional meeting of subsidiary bodies.
11-22 November 2013	COP-20 and CMP-10 meet in Warsaw, Poland.
	The ADP seeks "a balanced, focused and more formal mode of work," and considers the mandates, progress of work under institutions, mechanisms and arrangements under the Convention, and linkages of existing mechanisms to the options under the ADP.
September 2014	UN Secretary General Ban Ki-Moon convenes a meeting of world leaders to prepare for COP 21 later in 2014. With objections by some countries, he proposes that world leaders bring "bold pledges" to the summit.
3-14 June 2014	Sessional meeting of subsidiary bodies.
November-December 2014	COP-21 and CMP-11 meet in Latin America.
18-29 May 2015	Sessional meeting of subsidiary bodies.
November-December 2015	COP-22 and CMP-12 meet, possibly in France. Deadline for negotiating a new agreement via the Durban Platform for Enhanced Action.

Notes: Details regarding the UNFCCC can be found at http://unfccc.int/2860.php. Data on CO_2 concentrations can be found at http://cdiac.ornl.gov/trends/co2/. Data on CO_2 emissions from energy can be found at http://www.iea.org/co2highlights/. Research on the 2003 European heat wave includes Stott, Peter A., D.A. Stone, and Myles R. Allen. "Human contribution to the European heatwave of 2003." *Nature* 432 (December 2,

2004): 610-614; Jones, Gareth S., Peter A. Stott, and Nikolaos Christidis. "Human contribution to rapidly increasing frequency of very warm Northern Hemisphere summers." *Journal of Geophysical Research* 113 (January 24, 2008): D02109.; and Robine, J., S. Cheung, S. Leroy, H. Vanoyen, C. Griffiths, J. Michel, and F. Herrmann. "Death toll exceeded 70,000 in Europe during the summer of 2003." *Comptes Rendus Biologies* 331, no. 2 (February 2008): 171-178.

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