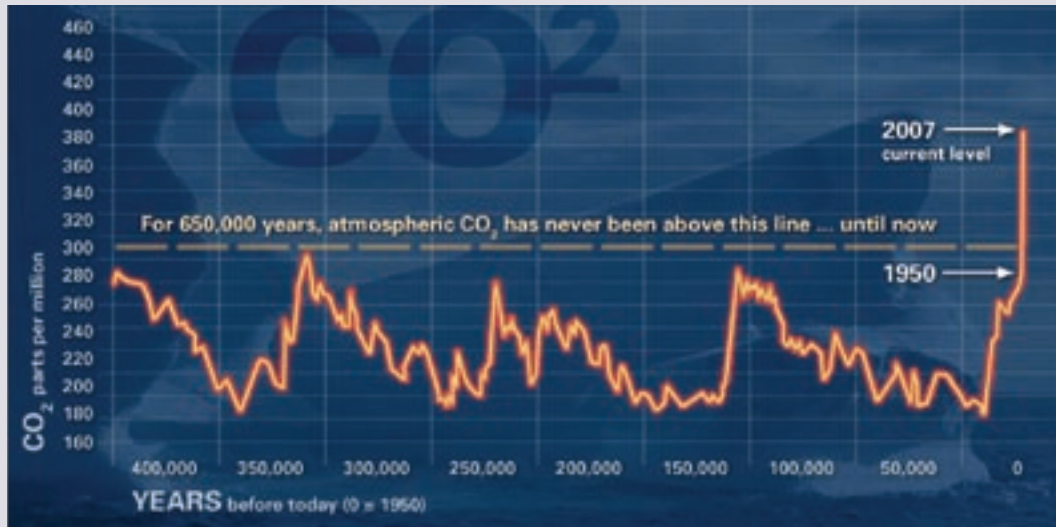


## Chapter 2: CLIMATE

### BACKGROUND



*This graph, based on the comparison of atmospheric samples contained in ice cores and more recent direct measurements, provides evidence that atmospheric CO<sub>2</sub> has increased since the Industrial Revolution. (Source: NOAA)*

- The [Intergovernmental Panel on Climate Change](#) (IPCC) has concluded that atmospheric temperatures must be held to 2.8°C above pre-industrial levels. Other leading climate scientists, non-governmental groups and the European Union have called for keeping the average temperature increase below 2°C to improve the chances of averting the worst consequences of climate change.
- Atmospheric temperatures already have increased 0.8°C and will increase another 0.5-1.0°C because of greenhouse gases in the atmosphere today. Computer models project that on our current trajectory, atmospheric temperatures could increase as much as 4.5°C this century.
- The world has a 50-50 chance of remaining at or below a 2.8°C level if global atmospheric concentrations of CO<sub>2</sub> are stabilized at 440 parts per million or less.<sup>1</sup> Atmospheric concentrations are now 385 parts per million and are growing at a rate of 2 parts per million annually worldwide. Under its most optimistic emissions projections, the IPCC says CO<sub>2</sub> concentrations will rise to 500 parts per million; with a less ambitious effort by the world community, concentrations will rise to 700-1,000 parts per million.
- The world community will have its best chance to remain below these levels if carbon emissions stabilize and begin to decline in industrial economies during the 2015-2020 period and worldwide by 2020.
- In December 2007, the European Union and other nations gathered at [Bali](#) proposed that the emissions-reduction target for industrialized nations should be 25-40 percent below 1990 levels by 2020 and 80 percent by 2050. Today, U.S. emissions are 40 percent *above* 1990 levels.<sup>2</sup>
- The goals proposed by both presidential candidates for U.S. emissions are considerably lower than the Bali target – 1990 levels by 2020 (or 11 percent below 2000 levels). None of the climate bills Congress has considered so far would reach the Bali target.

*(continued on next page)*

- According to the [U.S. Energy Information Administration](#) (EIA), U.S. carbon emissions are growing at about 1.6 percent annually in the United States and are projected to increase 36 percent above 1990 levels by 2030 – if we continue business as usual. Emissions would grow 50 percent by 2030 under the EIA’s high-growth forecast. Emissions come from the following sources (2006 data):
  - a) Electricity generation – driven largely by the nation’s buildings and appliances – accounts for nearly 34 percent of U.S. emissions. Generation accounted for 94 percent of the coal consumed in the United States in 2006;
  - b) Transportation accounts for 28 percent. Personal vehicle use is responsible for more than 60 percent of the CO<sub>2</sub> emissions from this sector;
  - c) The industrial sector is responsible for 19.4 percent of total greenhouse gas emissions. The most carbon-intensive industries are iron and steel, refining, cement, lime and chemical manufacturing;
  - d) Residential and commercial buildings respectively produce 4.8 and 5.6 percent of U.S. greenhouse gas emissions; and
  - e) Agriculture is responsible for 6.4 percent of greenhouse gas emissions, primarily from methane and nitrous oxide from livestock, soil cultivation, crop production and burning of agricultural residues.
- [Land uses and forestry served](#) as net sinks for greenhouse gas emissions in 2006, sequestering 12.5 percent of total U.S. emissions. McKinsey & Company projects that on its current course, the United States will lose 7 percent of its carbon absorption capacity by 2030.
- The United States is the source of 20 percent of the carbon emissions in the atmosphere today. Carbon dioxide emissions linger in the atmosphere for hundreds and even thousands of years. Today’s emissions will continue having impacts on the Earth’s climate for generations to come.
- Although the United States is not party to the [Kyoto Protocol](#), the United States signed and ratified the [United Nations Framework Convention on Climate Change](#), which went into force in 1994. Under the Convention, nations agreed to launch strategies to mitigate greenhouse gas emissions and adapt to climate change; to share national policies and best practices; and to take other actions necessary to stabilize emissions at a level that would prevent “dangerous anthropomorphic interference” with the climate system. Nations agreed to “common but differentiated responsibilities” and agreed that developed nations should take the lead with the goal of reducing and stabilizing emissions at 1990 levels by the year 2000.
- It is now widely recognized that [climate change is underway today in many parts of the world](#), including the United States. It can no longer be considered a problem that will affect only future generations.

## FRAMEWORK FOR FEDERAL POLICY

- U.S. policy should support the goal of holding global temperature increase to no more than 2°C above pre-industrial levels.
- Although the United Nations Framework Convention on Climate Change is nonbinding, the United States should pledge to comply fully with its provisions, including collaboration with other nations on greenhouse gas mitigation and climate adaptation and the principle of universal but differentiated action by developed and developing nations.
- The United States must accept its obligation to become a global leader in reducing greenhouse gases because we are the nation most responsible for the gases in the atmosphere today, as well as one of the nations most responsible for current emissions.
- [Carbon pricing](#) through a tax or a trading system is essential for mobilizing the marketplace against climate change, but it is not enough. Some needs, such as adaptation, would not be covered; some barriers are driven by non-market factors. Federal, state and local governments should use a mix of market mechanisms, standards, regulations and incentives to rapidly reduce the nation's greenhouse gas emissions.
- While putting these mechanisms in place, the nation must prevent carbon lock-in – the construction of new carbon-intensive power plants, inefficient buildings and low-efficiency petroleum-powered vehicles that commit the United States to decades of additional greenhouse gas emissions.
- [Federal, regional, state and local leaders should coordinate their programs and authorities.](#) In general, the federal role should be to establish minimum requirements and to encourage states, as the nation's policy laboratories, to exceed them.
- However, leaders in government and civil society must recognize that public welfare and national security trump concerns about federal preemption or government regulation. The federal government should closely monitor the nation's progress toward meeting its emission reduction targets to determine whether stronger federal action is necessary.
- Federal policymakers should avoid imposing unfunded mandates on states and localities. Revenues from carbon trading, eliminating fossil energy subsidies and redirecting other public subsidies that result in carbon emissions should be used, in part, to provide resources and incentives for aggressive state and local action.
- National policy should maximize the use of forests, farmland and soils to serve as carbon sinks.
- National policy should emphasize early reductions. Later reductions are more costly and difficult to achieve.

## EXECUTIVE ACTIONS

1. Issue a presidential directive<sup>3</sup> establishing **aggressive new goals** for economy-wide greenhouse gas reductions in the United States. The goals should be to stabilize national CO<sub>2</sub> emissions by 2015; to achieve a 25-30 percent reduction compared to 1990 emission levels by 2020 (consistent with the goal of the European Union); and to reduce emissions at least 80 percent by mid-century.
2. Issue an executive order directing the administrator of the U.S. Environmental Protection Agency (EPA) to expedite a “determination on endangerment” regarding greenhouse gas emissions and, if such a determination is made, to proceed expeditiously in the process of regulating **greenhouse gases** under the Clean Air Act.<sup>4</sup>

Preliminary work on greenhouse gas regulation was begun at the EPA after the U.S. [Supreme Court](#) ruled in 2007 that the agency has the necessary authority. The EPA issued an “[Advance Notice of Proposed Rulemaking](#)” that analyzed the issues involved in regulation. The Bush Administration decided to leave the issue for the next administration to resolve.

While the lengthy process usually involved in regulation – including rulemaking, public comment and potential litigation – may not be concluded before the international community agrees upon a greenhouse gas reduction plan to succeed the Kyoto Protocol, initiating the process will signal the United States’ commitment to climate action. More importantly, regulation under the Clean Air Act may facilitate emissions reductions not reached by a national or international carbon trading program. If greenhouse gases are regulated using State Implementation Plans, each state could tailor its carbon reduction plan to fit its political environment, resources and economic conditions.

This executive order also should direct the EPA administrator to determine how the Clean Air Act can best be used to regulate carbon emissions from existing coal-fired power plants; how to regulate emissions not covered by cap-and-auction legislation; how to integrate the regulation of CO<sub>2</sub> with the regulation of criteria pollutants and mercury; how to integrate State Implementation Plans with State Energy Plans and each state’s climate change action plans; and how the Clean Air Act might address non-market barriers to greenhouse gas reductions.<sup>5</sup>

3. Issue a presidential proclamation that the atmosphere is a **public commons** that is the responsibility of federal officials to protect as a public trust. Accompany this proclamation with an executive order directing the Office of Personnel Management to work with federal employee unions, program supervisors and agency management to incorporate this principle into position descriptions, performance standards and the performance ratings used to determine salary increase, bonuses and promotions for federal employees.<sup>6</sup>
4. Restore the **integrity of federal climate** science.<sup>7</sup> The federal government has formidable scientific resources to help the nation understand and address global climate change. It employs some 100,000 scientists and engineers and operates 700 research institutions. Thirteen federal agencies participate in the federal [Climate Change Science Program](#) (CCSP), charged with researching the causes and effects of global warming and providing critical information to decision-makers in the United States and around the world.

The [Bush Administration](#) has systematically undermined the strength and integrity of federal climate science, filling key positions with lobbyists from the fossil energy industries; authorizing them to edit and censor scientific reports; reducing funding for earth sciences; failing to honor congressional deadlines for scientific reports; and even deleting the phrase “understand and protect the home planet” from the mission statement of the National Aeronautic and Space Administration (NASA).

The Congressional Research Service (CRS) reports that since 2005, [funding for climate change research and analysis at NASA has declined](#). The [National Research Council](#) (NRC) reports that NASA's funding for earth sciences has declined 30 percent since 2000. According to the NRC, cuts proposed by the Bush Administration in the budget for earth sciences would result in "severe impacts on the long-term strategy and capacity building" in climate research. Federal scientists report there is a critical need for new satellites and terrestrial instruments to monitor climate change; more sophisticated computer programs to analyze data and predict climate impacts; and for basic and applied climate research.

The National Center for Atmospheric Research (NCAR) – one of the U.S. institutions that participated in the IPCC's Nobel Prize-winning studies – announced in August 2008 that [budget cuts had forced it to shut down a program designed to help poor countries anticipate and survive droughts](#), floods and other severe impacts of climate change. The program was terminated<sup>8</sup> just two months after the [National Intelligence Council issued an assessment](#) that climate change is a serious threat to U.S. national security, in part because of the disruptions it will cause in those same impoverished and volatile regions. In addition, NCAR reportedly has lost more than 100 scientists to budget cuts in the last two to three years.

Today, 70 percent of American adults believe the United States is no longer a world leader in science achievement and the [integrity of federal science](#) is in question. The next president must re-establish the credibility, reputation and resources of federal science programs, most urgently those that help us understand and find solutions to climate change.

- a) End **political interference in scientific inquiry**. The president should issue an executive order that clearly states the importance of federal climate science and reinstates the principles of scientific freedom in the federal government. The order should forbid any public official from undue interference in scientific inquiry and reporting; make clear that scientists have the right of final review of the technical content of federal reports; allow scientists free access to the media; and allow them to release scientific reports to the public in draft form if an agency doesn't give the report timely approval.
- b) **Appoint the nation's best experts to climate-critical positions in the federal government**. The Presidential Climate Action Plan (PCAP) has created an inventory of climate-critical positions in the administration and a ["Who's Who in Climate Action"](#) – a list of experts in climate science, policy and communications who the president can consider for those jobs. The president should seek an agreement from the outgoing administration to prevent "burrow ins"<sup>9</sup> by freezing hiring throughout the government during the transition period. The president's transition team should meet with Senate leaders to coordinate and expedite Senate confirmation of the president's climate-critical appointees.
- c) **Raise the science profile the federal government**. The president should reestablish the position of Assistant to the President for Science and Technology as a direct report to the chief executive.
- d) **Restore the government's leadership role in climate science and technology**. The president should direct the administrator of NASA to restore the phrase "understand and protect the home planet" in the agency's mission statement.<sup>10</sup> The president should direct that in their fiscal year 2010 budget requests, the 13 agencies involved in the CCSP should request full funding for [research, staff and capacity related to global climate change](#).

- e) **Launch a [National Climate Change Preparedness Initiative](#)** as proposed by [Climate Science Watch](#) to make the federal research programs more relevant to all levels of government and civil society. The initiative would provide stakeholders with engagement and decision-support, helping them assess vulnerabilities to climate change and to develop effective adaptation and mitigation strategies.
- f) **Comply with the provisions of the [Global Change Research Act](#).** The Act makes the president responsible for “developing and proposing to Congress a coordinated national policy on global climate change.” In August 2007, a federal court [rebuked the Bush administration](#) for failing to issue reports that Congress required on the impacts and consequences of global warming in the United States. Plaintiffs alleged that the administration had suppressed two reports meant to guide Congress and federal agencies on climate research. The president should direct agencies to fully comply with the requirements and timetables in the Act. The president-elect’s transition team should incorporate PCAP proposals into a national climate policy plan the president announces during the State of the Union address and introduces as part of the administration’s first legislative package.
- 5. Make carbon visible.** Issue an executive order requiring agencies to include climate impact statements in their budget submissions to the Office of Management and Budget, legislative proposals and reports to Congress and the public.<sup>11</sup> The president should direct the Council on Environmental Quality to issue guidance requiring federal agencies to prepare climate impact statements for all federally funded projects under the [National Environmental Policy Act](#). In addition, where agencies have been delegated authority by Congress, direct them to add greenhouse gas information to appliance efficiency labels (anticipated annual emissions) and automobile efficiency labels (average carbon production per mile).
- 6.** Issue an executive order establishing a presidential policy that **the federal government should encourage states to be aggressive in reducing their greenhouse gas emissions**. On Feb. 29, 2008, EPA Administrator Stephen Johnson [denied a waiver](#) that would have allowed California and other states to establish greenhouse gas emissions standards for new vehicles. California and several other states that wanted to implement the standard have sued. While the president cannot affect Johnson’s ruling, he can influence future waiver requests by establishing the policy that states should be encouraged to be more aggressive than federal law.<sup>12</sup>
- 7.** Instruct the [Council on Environmental Quality](#) to enter into talks with congressional leaders to define “**climate change emergency**” and whether the executive branch has adequate authority to respond to such emergencies and the threat of such emergencies. Direct CEQ to prepare recommendations on any new authority the president or members of his administration should be granted by Congress to deal with climate change emergencies.<sup>13</sup>
- 8.** Rally the nation to **improve ecological, science and technology education**. In the same survey cited in Action No. 4 above, nearly [80 percent](#) of American adults believe that science is not receiving the attention it deserves in our schools. The urgency of global climate change clearly has not created the surge of interest in science that President John F. Kennedy created when he announced that America would go to the moon. Yet, climate change is a challenge that’s here to stay. Future generations will have to understand and address it. Reminiscent of President Kennedy’s Apollo program, the president should rally the nation’s educators to give new emphasis to improving ecological, science and technology education, including the dynamics and causes of global warming.

## LEGISLATIVE ACTIONS

9. Introduce an **upstream cap-auction-invest** bill to the Congress. The president should meet early with Congressional leaders to agree on U.S. climate action before the international meeting in Copenhagen in December 2009.<sup>14</sup> At that time, the president should send a proposal for carbon pricing to Congress to establish his position on that issue.

The approach with most momentum in the 110<sup>th</sup> Congress was a cap-and-auction system that would issue emission allowances to large polluters – utilities and large industries – referred to as a “mid-stream” regime. The president should advocate pure “[upstream](#)” trading, in which allowances are auctioned to the 1,500-2,000 producers of fossil fuels in the United States (as opposed to emitters).

Midstream trading would create a strong motive for utilities and industries to innovate and cut their emissions to profit from carbon trading. However, the upstream approach has other advantages. It would be more transparent and easier to administer, and it would provide a relatively simple way to price carbon throughout the entire economy.

The president should insist that whatever architecture is approved by Congress, it must fulfill a number of criteria to gain his signature:

- a) cover all six greenhouse gases;
  - b) produce emission reductions of at least 80 percent below 1990 levels by 2050, and 20-30 percent by 2020;
  - c) auction 100 percent of the emission allowances;
  - d) be transparent, simple and relatively inexpensive to administer;
  - e) cover the entire economy;
  - f) be flexible, with some mechanism to regularly review its performance and to adjust carbon caps and prices as necessary to meet emission-reduction goals, without requiring further Congressional action;
  - g) be compatible with whatever international carbon-control mechanism the international community develops to succeed the Kyoto Protocol;
  - h) measure carbon reductions in absolute tons rather than in carbon intensity (emissions per dollar of Gross Domestic Product). Absolute reductions are required to bring climate change under control;
  - i) reward early adopters.
10. Create an independent **Earth Systems Science Agency** (ESSA) by merging selected functions of the National Oceanic and Atmospheric Administration and the U.S. Geological Survey. The agency would conduct and sponsor research in, and disseminate knowledge about, climate impacts on atmospheric, terrestrial, cryosphere, freshwater and ecological processes, and provide stakeholders with comprehensive information on earth processes, including natural disasters and extreme weather.<sup>15</sup>

- 11.** Increase the nation's investment in preparing the next generation of U.S. [scientists and technicians](#). The president should request robust funding for the federal government's national laboratories to develop curricula on energy and climate and to sponsor internships. In addition, the president should propose that Congress:
- a) Fully fund the [America COMPETES Act \(P.O.L. 110-69\)](#) approved by the 110<sup>th</sup> Congress to improve science, technology, engineering and mathematics education to provide the skills necessary for building a new energy economy.
  - b) Enact the proposed [No Child Left Inside](#) legislation to engage pre-, primary- and secondary-school children in environmental awareness and education. Strengthen the bills by including funding to develop curricula and support teacher training about climate change mitigation and adaptation.
  - c) Develop a **Climate Solutions Education bill** to provide scholarships, fellowships and grants to the nation's colleges and universities to support research and education, including curriculum development in climate science and solutions, social sciences, engineering and design.
  - d) Enact a **Climate Education and Readiness Act**, a comprehensive federal effort to build a climate and environmentally literate nation. This bill would:
    - i. direct existing federal education/extension programs such as the Sea and Land Grant programs, United States Department of Agriculture (USDA) extension and the [Centers for Ocean Sciences Education Excellence](#) to give appropriate attention and education resources to climate mitigation and adaptation;
    - ii. provide funding to expand existing federal programs to include climate change education such as the USDA's citizen science networks and youth programs such as 4H; the EPA's public-private partnership "[Climate Leaders](#)," "[Green Power Partnership](#)" and "[SmartWay Transport Partnership](#)" programs to include educating employees on climate/economy interrelationships; the federally supported community college [Partnership for Environmental Technology Education](#) to include educational programs and resources for an emerging green collar workforce; and the Department of Labor's [YouthBuild](#) and [Community-Based Job Training Grants](#) programs;
    - iii. create new programs such as a Climate Change Education Centers for Excellence program to integrate climate change education into professional education (including continuing education) and training in fields such as architecture, engineering, urban, coastal, transportation and community planning, natural resource management (agriculture, wildlife, and forestry sectors in particular), public health and business management;
    - iv. develop a National Science Foundation program to fund projects that increase public interest, understanding, engagement and lifelong learning in climate change
    - v. direct the National Institutes of Health program to fund methods for integrating climate change impacts on health issues into health curricula at all levels;
    - vi. fund a National Oceanic and Atmospheric Administration program to build the capacity and effectiveness of the climate change and environmental education sector by helping to identify and scale the best approaches;



- vii. fund a community outreach partnership centers program at the EPA for urban universities to develop research and education on climate adaptation and mitigation issues for distressed local communities; and
- viii. provide scholarships, fellowships and internships for undergraduates and graduates in climate science and solutions, including social sciences, engineering and design.

<sup>1</sup> Dr. James Hansen of the Goddard Institute for Space Studies at NASA believes atmospheric concentrations must return to 300-350 parts per million to have a reasonable chance of avoiding catastrophic climate change.

<sup>2</sup> For a more detailed discussion of U.S. policy on international climate negotiations, see the International section.

<sup>3</sup> The statutory authority for the president to take this action, and several others in PCAP, is identified in [“The Boundaries of Executive Authority,”](#) prepared for PCAP by the Center for Energy and Environmental Security at the University of Colorado Law School. See Page 20.

<sup>4</sup> [Boundaries](#), 45-48.

<sup>5</sup> A number of states already have begun to work on these issues. Contact Cliff Rechtschaffen of the California Department of Justice, [cliff.rechtschaffen@doj.ca.gov](mailto:cliff.rechtschaffen@doj.ca.gov).

<sup>6</sup> [Boundaries](#), 83-95.

<sup>7</sup> For additional reforms of federal science beyond climate change, see [“Saving Science from Politics”](#) by the Center for Progressive Reform.

<sup>8</sup> Shortly before this report was finalized, NCAR's [Center for Capacity Building](#) arrangements were made to establish the project at the University of Colorado, Boulder.

<sup>9</sup> When an outgoing administration gives political appointees permanent civil service positions, the practice is called “burrowing in.”

<sup>10</sup> “The Boundaries of Executive Authority,” 63-64.

[“The Boundaries of Executive Authority.”](#) 67-72.

<sup>11</sup> *Ibid*, 49-52

<sup>12</sup> *Ibid*, 65-66.

<sup>13</sup> See the International section for more background.

<sup>14</sup> For further details of the ESSA proposal, see Mark Shaefer et.al., [“An Earth Systems Science Agency,”](#) *Science* Vol. 321, No. 5885, July 4, 2008.