

Climate Action in the United States and China

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The United States and China together produce almost 40 percent of the greenhouse gas emissions that now threaten to alter the global climate. Any successful global effort to reduce greenhouse gas emissions will therefore require the direct support and participation of both countries.

The United States and China are beginning to acknowledge their roles in shaping a response to the problem of greenhouse gas emissions and, intentionally or not, each country has taken steps to slow the growth rate of emissions. For example, both China and the United States have limited growth in greenhouse gas emissions through energy efficiency and energy conservation programs. If Chinese energy intensity had remained constant at the 1977 level, China would be emitting more than twice the greenhouse gas emissions that it currently does. Using the same measures and timeframe, the United States has limited growth in greenhouse gas emissions by approximately 25 percent. The United States is also leading the effort to better understand the science of climate change and the specific policy options available domestically and internationally.

However, emissions in both countries continue to grow and new efforts are needed. The December 1997 Kyoto Protocol is a possible starting point to achieve reductions in global greenhouse gas emissions. While both the United States and China have signed the Protocol, neither has ratified it yet.

Negotiations between the two countries on whether and how to implement the Kyoto Protocol continue. One barrier is a lack of recognition by each country about the accomplishments of the other. A better understanding of each country's activities³⁴ and each country's negotiating stance

The Context for Action

The People's Republic of China and the United States are both parties to the United Nations Framework Convention on Climate Change (UNFCCC) and signatories to the Kyoto Protocol, but they have significantly different obligations under these commitments. As an Annex I party (developed country) to the UNFCCC, the United States voluntarily agreed in 1992 to aim to hold greenhouse gas (GHG) emissions at 1990 levels by the year 2000. If ratified, the Kyoto Protocol (completed in December 1997) would require the United States to reduce GHG emissions 7 percent below 1990 levels in the 2008-2012 timeframe.

China, as a non-Annex I party (developing country), has “common but differentiated” responsibilities as outlined in Article 4 (a-j) of the UNFCCC. These commitments require China to survey sources and sinks of greenhouse gases, account for changes in sources and sinks in economic planning, and take steps to reduce the likelihood of climate change. Unlike Annex I countries, China is not obligated to reduce GHG emissions, nor will it be required to do so even if the Kyoto Protocol is enacted. The Protocol, however, encourages non-Annex I countries such as China to take voluntary action to limit their emissions as quickly as possible. Two non-Annex I countries, Argentina and Kazakhstan, have currently volunteered to adopt targeted emissions reductions.

China's greenhouse gas emissions—the most important of which is carbon dioxide (CO₂)—are increasing rapidly. These emissions will likely surpass those of the United States within 25 years (see Figure 1). Much of this growth can be attributed to China's massive population—

Figure 1 - Energy-related carbon dioxide emissions from the U.S. and China, 1970–2020



four times that of the United States—and the fact that China has quadrupled personal income levels over the past twenty years. It is important to keep in mind that China is still a developing country. China's gross domestic product (GDP) per capita in purchasing power parity is, optimistically, only one-eighth that in the United States, and many rural Chinese citizens still live in abject

Table 1 - Basic indicators for China and the United States

	<u>China</u>	<u>USA</u>
Population (millions), 1998	1,243	270
Population Growth Rate (%), 1997	1.1	0.9

Although its carbon dioxide emissions will most likely continue to increase, China deserves recognition for an energy conservation program that has already reduced carbon emissions by hundreds of millions of tons each year when measured against a baseline scenario. Over the past two decades, China has held growth in energy consumption at half the level of economic growth, unlike other developing countries such as India, South Korea, and Brazil, in which growth in energy consumption has exceeded economic growth. China has managed to uncouple energy growth from economic growth more effectively than even most developed countries.

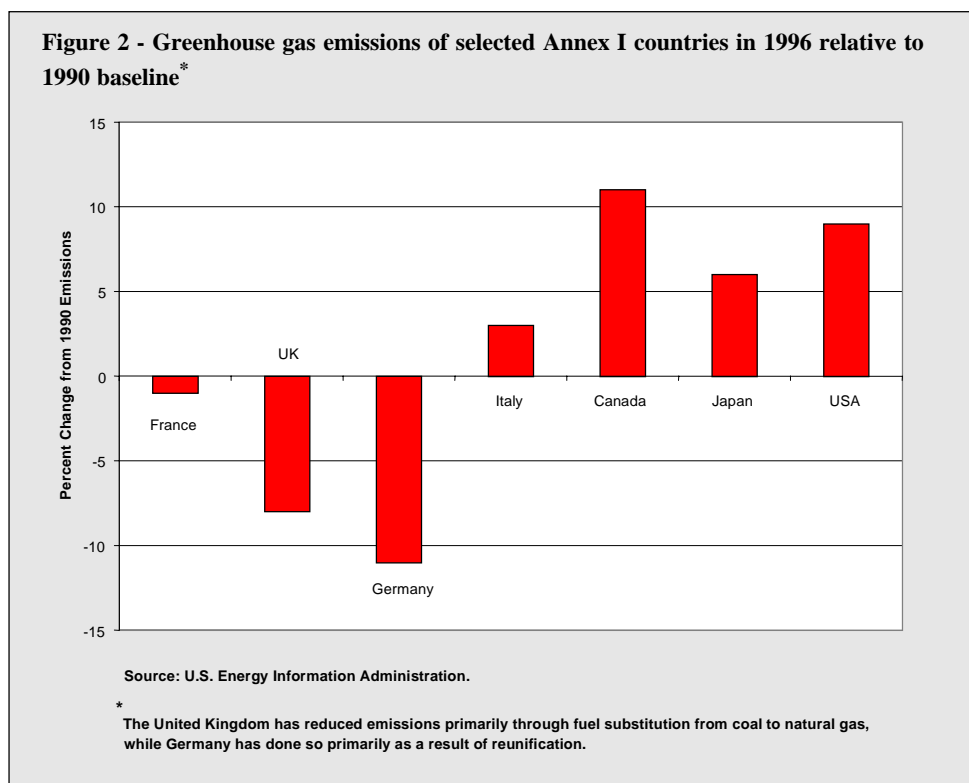
The United States should also be recognized for its greenhouse gas emission reduction efforts. Over the past two decades, the United States has carried out a variety of energy-efficiency efforts that have resulted in hundreds of millions of tons of reduced carbon emissions each year when measured against a baseline scenario. Additionally, the United States is spending billions of dollars at home and abroad to research essential questions regarding climate change.

Some Annex I countries criticize China, as an influential member of the developing country community, for not playing a more constructive role in international climate change negotiations. These countries argue that global efforts to reduce GHG emissions will be meaningless unless both developed and developing countries take joint action. This belief is based on three concerns. First, emissions from developing countries are growing rapidly and will eventually offset any mitigation efforts from Annex I nations, resulting in little net change in atmospheric concentrations. Second, Annex I nations could lose competitive advantage to non-Annex I countries if they incur the added costs of emission mitigation unilaterally. Finally, energy-intensive industries in Annex I countries could simply transfer production to non-Annex I countries if unilateral reductions are required.

Non-Annex I nations, however, claim that industrialized countries have created most of

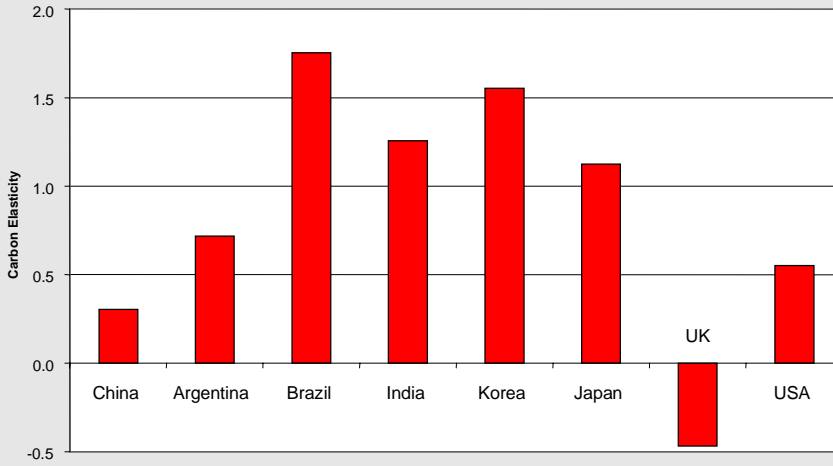
the global climate change problem and therefore have the historical responsibility, and resources, to act first. Data in Table 1 show that the United States is responsible for almost five times the amount of carbon emissions as China over the course of the twentieth century. Other stakeholders in the negotiations have also criticized the United States for pushing the trade of permits for “hot air” emissions.² These critics claim that the United States would buy these emission permits as a substitute for reducing emissions domestically. While carbon trading is an economically efficient tool for reducing greenhouse gas emissions, trading hot air would not benefit the global climate in the short term.

Other participants, both Annex I and non-Annex I, note that the United States is failing to meet even the voluntary target agreed upon in 1992 of holding emissions in the year 2000 to their 1990 level (Figure 2). Most of these participants, including China, believe that the United States should first demonstrate its concern about global climate change by lowering emissions domestically before it can expect developing countries to accept targeted emission reductions.



Finally, it is instructive to examine the nature of carbon emissions across countries relative to economic growth. Carbon elasticity measures the percentage change in carbon emissions per unit change in economic activity. Figure 3 demonstrates that while China’s carbon emissions have grown about one-third as quickly as its economy this decade, developing countries typically have ratios greater than 1. In the United States, carbon emissions have grown slightly more than half as quickly as the economy.

Figure 3 - Carbon elasticity of major greenhouse gas producers, 1990-97³



Source: BP Statistical Review of World Energy 1998; Energy Information Agency; Battelle Memorial.

Actions and Accomplishments

This section presents a side-by-side display of climate change actions and accomplishments in China and the United States. Information is provided under two headings: treaty activities and domestic activities. These headings do not always allow for precise classification. We focus on concrete achievements that have already occurred; future plans are not discussed to maintain an objective, rather than speculative, approach. Finally, it is not possible to record every activity in each country due to space limitations. For more details, see the references at the end of this document.

Treaty Activities

China

- Ratified the United Nations Framework Convention on Climate Change in 1992.
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Treaty Activities

United States

- Ratified the United Nations Framework Convention on Climate Change in 1992, the first industrialized country to do so.
- Signed, but has yet to ratify, the Kyoto Protocol in November 1998.

Bilateral Technical Assistance

The United States has assisted developing countries in understanding the science of climate change and in taking actions to address the impacts of climate change. The following are examples of two such activities:

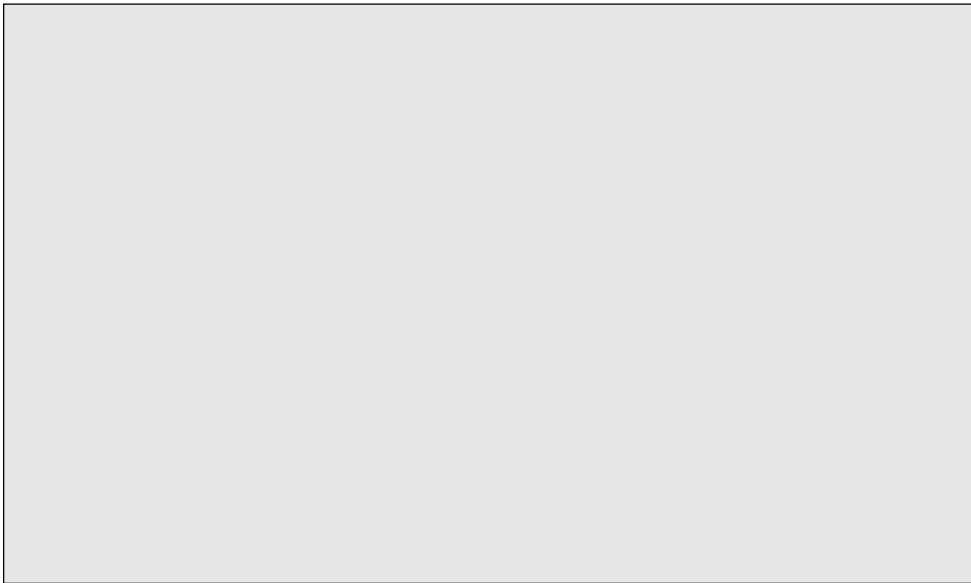
- Contributes technical assistance worth hundreds of millions of dollars to developing countries through the U.S. Agency for International Development (USAID), U.S. Department of Energy (DOE), and U.S. Environmental Protection Agency (EPA). USAID has made mitigation of climate change one of two global environmental priorities and works with over ten leading greenhouse gas producing countries on these issues.⁴

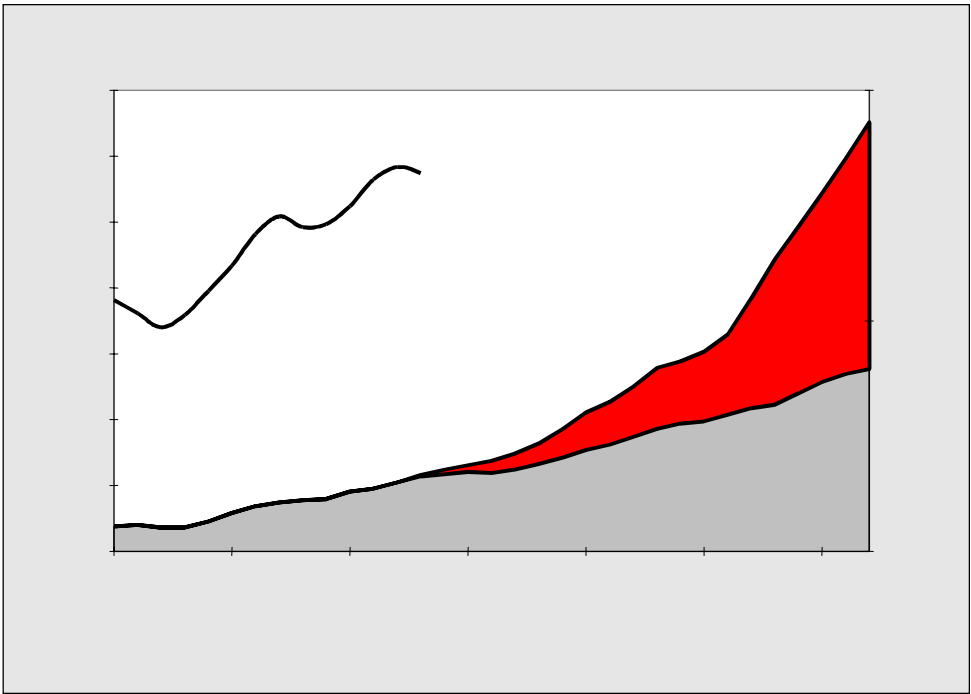
Domestic Activities

China's domestic greenhouse gas activities, like those in most nations, have focused on “no-regrets” strategies in energy efficiency and conservation, clean energy supply, and reforestation. In addition to mitigating greenhouse gas emissions, these efforts cut energy costs and reduce local pollution. Intentional or not, China's greatest accomplishment in addressing climate change has been the success of energy conservation and energy-efficiency programs first established almost two decades ago. These efforts continue to play an important role in the country's energy policy.⁵ We outline these successes after highlighting three domestic actions directly related to climate change:

- Established the National Climate Change Coordinating Group in 1990 to study policy issues and interagency coordination
- Created China's Agenda 21, a strategy to put China on a sustainable development path in the 21st century. This strategy has not yet been widely utilized or implemented in China's economic planning process
- Expanded the role for environmental NGOs to promote education and demonstrate energy saving technologies.

Domestic Activities





Domestic Activities - United States (continued)

Research & Development

The United States has placed an emphasis on new technologies and research to help reduce greenhouse gas emissions. The following are examples of these efforts:

- Created a five-year, \$6.3 billion initiative in 1998 combining research and development with selective tax cuts to create a bigger market for climate-friendly products. Approximately \$1 billion was funded during 1999 and more is targeted for spending in 2000.
- Invests over \$1.8 billion annually in the U.S. Global Change Research Program that provides the national and international communities with scientific research on climate change, and with information and innovative solutions for achieving emissions reductions.

State and Local Efforts

Some states and municipalities have enacted their own energy efficiency programs that supplement federal activities.¹¹ Examples include:

- Creating tax credits for purchasing efficient equipment
- Assisting homeowners to insulate and weatherize their residences
- Planning climate-friendly urban transportation development
- Partnering with electric power utilities to lower demand
- Developing local government networks to share information and success stories.

Figure 5 – U.S. energy consumption and energy intensity, 1965-1997



Clean Energy Supply

China

Coal, which causes heavy local pollution and produces almost twice as much carbon dioxide per unit of usable energy as natural gas, accounts for three-quarters of China's energy supply. China is struggling to accelerate the development of cleaner fuels such as natural gas and coalbed methane, yet coal will continue to play a major role in the near future because it often has the cheapest up-front costs. China is currently:

- Developing natural gas and coalbed methane infrastructure to offset coal consumption
- Boosting combined heat and power installations, which now account for over 10 percent of installed electrical generation capacity
- Adding approximately 3,000 megawatt (MW) of hydropower plants annually, although some, like the massive Three Gorges project, are controversial
- Attempting to increase nuclear power capacity despite high costs and financing problems
- Developing renewable energy sources such as wind power and photovoltaics in off-grid regions and where they are competitive with other options. Installed wind capacity is now 240 MW, and units under construction will double this value by 2000.

Partial assistance from the World Bank, GEF, and UNDP is helping China carry out the following clean energy projects:

- Natural Gas Transmission and Distribution Line Rehabilitation (\$123m)
- Methane Recovery and Utilization (\$20m)
- Commercialization of Renewable Energy (\$28m)
- Renewable Energy Development (\$408m).

Forestry Issues

China

While the effectiveness of its reforestation efforts has been questioned, China is taking dramatic steps to increase its forest coverage and to protect forested areas in some regions of the country, as is evidenced by the following:

- Over 10 billion trees were planted in China during the 1980s and forest coverage increased to almost 14 percent of landmass by 1997.
- Powerful floods during the summer of 1998 have led to new land protection policies in some regions of China and contributed to the banning of logging activities by state owned enterprises in especially sensitive regions of China.

Forests and Climate Change

The role of forests in global climate change is still relatively uncertain. However, it is clear that trees uptake carbon dioxide while growing, thereby reducing the concentration of greenhouse gases in the atmosphere. Reforestation and forest conservation efforts in both the United States and China could consequently play a significant role in determining the concentration of atmospheric greenhouse gases and in calculating each country's overall emissions reductions.

Clean Energy Supply

United States

Coal consumption in the United States is now limited almost exclusively to power generation and coking operations. Natural gas consumption and hydroelectric output in the power sector is increasing while nuclear output is stable or declining slowly. Hydropower currently generates approximately 10% of the nation's electricity. The United States has:

- Restructured the natural gas sector beginning in the early 1980s, resulting in expanded gas supplies and lower costs
- Installed wind energy capacity amounting to over 1,650 MW in 1997 with assistance from federal subsidies
- Tripled coalbed methane production since 1990 (30 billion cubic meters a year in 1997), avoiding the release of this potent greenhouse gas into the atmosphere
- Spent millions of dollars researching photovoltaic, biomass, and other forms of renewable energy
- Provided tax credits for efficient vehicles
- Converted tens of thousands of vehicles to operate on natural gas and other alternative fuels
- Demonstrated that environmental goals can be met cost-effectively with market incentives. For example, the Clean Air Act has reduced sulfur dioxide emissions with tradable permits at one-tenth the estimated cost of non-market mechanism reductions.

Forestry Issues

United States

Over the past century, the United States has acted to protect its forested areas and manage forests open to commercial logging. Although these efforts have sometimes been unsuccessful, U.S. forests cover approximately 30 percent of the country's land area and are a significant sink for greenhouse gas:

- Forest growth has outpaced consumption for several decades; the ratio of growth to harvest is 1.37.
- Forestland has increased since the 1960s, from 251 million hectares to 298 million hectares in 1992.

Both China and the United States have reduced greenhouse gas emissions from expected levels through energy efficiency and energy conservation programs. The United States has led the effort to better understand the science of climate change and the specific policy options available domestically and internationally. The United States has also invested significant effort and resources to assist developing countries to begin meeting the challenges of global climate change. China has instituted a successful energy conservation program over the last two decades,

For more information on climate change activities in the two countries, see these Internet references:

Bilateral and Multilateral References

Framework Convention on Climate Change and Kyoto Protocol
<http://www.unfccc.de>

Working Group on Environment in U.S.-China Relations (Woodrow Wilson Center)
<http://ecsp.si.edu/china.htm>

Global Environment Facility
<http://www.gefweb.com>

Carbon Dioxide Information Analysis Center (Oak Ridge National Laboratory)
<http://cdiac.esd.ornl.gov/home.html>

References on U.S. Activities

U.S. Global Change Research Program
<http://www.usgcrp.gov/>

U.S. Environmental Protection Agency Site on Global Warming
<http://www.epa.gov/globalwarming/>

U.S. Climate Action Report (State Department)
http://www.state.gov/www/global/oes/97climate_report/

References on Chinese Activities

Case studies of Chinese climate change mitigation
<http://www.pnl.gov/China/pubs.htm>

The Professional Association for China's Environment (PACE)
<http://www.chinaenvironment.net/>

The Beijing Energy Efficiency Center
<http://www.gcinfo.com/becon>

Chinese scientific perspectives on climate change
<http://www.usembassy-china.gov/english/sandt/index.html>

China Energy, Environment and Sustainable Development (UNDP)
<http://www.edu.cn/undp/shd/sustain.htm>

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