

China CO2 Emissions Growing Faster Than Anticipated

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for [National Geographic News](#)

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China's greenhouse gas emissions are rising much faster than expected and will overshadow the cuts in global emissions expected due to the Kyoto Protocol, according to a new study.

Forecasts from the Intergovernmental Panel on Climate Change (IPCC) had predicted that China's carbon dioxide (CO2) emissions would rise by about 2.5 to 5 percent each year between 2004 and 2010.

(Related: ["Global Warming Can Be Stopped, World Climate Experts Say"](#) [May 4, 2007].)

But the estimates are two to four times too low, according to new research led by Maximilian Auffhammer of the University of California, Berkeley.

The study calculated that for the period from 2004 to 2010, [China's](#) CO2 emissions will have grown by at least 11 percent a year.

"The emissions growth rate is surpassing our worst expectations, and that means the goal of stabilizing atmospheric CO2 is going to be much, much harder to achieve," Auffhammer said.

Kyoto Concerns

The new findings threaten to throw a damper on the Kyoto Protocol, an international agreement to reduce emissions of carbon dioxide into the atmosphere.

Most countries—including all major industrialized countries except the U.S.—have signed on to the Kyoto Protocol. (Related: ["Australia Signs Kyoto Protocol; U.S. Now Only Holdout"](#) [December 3, 2007].)

But a major sticking point for the U.S. is that the agreement only mandates reductions for developed countries, mostly in North America and Europe. These areas are currently responsible for most of the CO2 that's causing [global warming](#).

Developing nations such as China, India, and Brazil are exempt from any reduction targets.

But China, the world's most populous country, has been developing at lightning speed—perhaps faster than any country in history.

Since most of its electricity comes from coal, for instance, China has been building coal-fired power plants at a rate of roughly two a week for the past few years.

The country recently surpassed the U.S. to become the world's single leading emitter of CO₂, according to another recent study. (China has more than four times the population of the U.S., however, so China's emissions per person are much lower.)

China's greater-than-anticipated emissions may completely nullify the Kyoto reductions, raising the pressure to find ways for the country to grow cleanly, according to experts.

"Making China and other developing countries an integral part of any future climate agreement is now even more important," Auffhammer said.

Getting Provincial

To create the updated forecast, the new study took the novel approach of looking at each of China's provinces individually.

"Everybody had been treating China as single country," said study co-author Richard Carson of the University of California, San Diego.

But each of its more than 20 provinces is large, with populations bigger than many European countries, Carson pointed out. The areas have different standards of living and different rates of development and population growth—all of which the new study factors in.

Also, many of the new coal-fired power plants that have been built in the past few years are low-cost designs, which are less efficient and therefore emit more CO₂.

"The problem is that power plants, once built, are meant to last for 40 to 75 years," Carson said. "Our forecast incorporates the fact that much of China is now stuck with power plants that are dirty and inefficient."

The new study will be published in the May issue of the *Journal of Environmental Economics and Management*.

Future in Doubt

"The results are quite persuasive," said Richard Morgenstern of Resources for the Future, a nonprofit think tank based in Washington, D.C. "It confirms what we had thought based on strictly anecdotal evidence.

"China is not managed in the monolithic way that people imagine," so it is important to focus on trends in various provinces, as in the new study, he said.

"The abundance of cheap coal available in China and the phenomenal increases in energy consumption [are] cause for concern," added Jay Gregg of the University of Maryland in College Park.

"However, there are many reasons for hope," Gregg said. These include "a rising environmental consciousness in China, large afforestation efforts, [and] high vehicle fuel efficiency standards."