

# Carbon Offsets: No Sure Bet to Prevent Climate Change

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*The 1997 Kyoto Protocol requires developed countries to reduce greenhouse gas emissions to below 1990 levels. In 2005, the European Union implemented a “cap-and-trade” scheme based on an arguably successful U.S. program to lower sulfur dioxide emissions.*



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Participating countries have set upper limits (“caps”) on greenhouse gas emissions and allow companies to sell (“trade”) unused emissions rights to other firms. The caps are supposed to be gradually reduced to reach Kyoto’s emissions reduction targets.

A second way a country (or company) can meet its emission targets is to pay others to reduce their emissions. To facilitate this process, the United Nations created the Clean Development Mechanism (CDM), an international market where buyers who need to offset their emissions can purchase carbon credits from developing countries — effectively paying for emission reductions by others.

These programs have not lowered overall emissions in developed countries. In the European Union (EU), emissions of carbon dioxide (CO<sub>2</sub>) have gone up, not down. By contrast, CO<sub>2</sub> emissions in the United States, which did not ratify the Kyoto treaty, have grown much more slowly than in the EU. [See the figure.] U.S. emissions even declined in 2006.

**Problem: Verifying Emissions Cuts.** Typical emissions reductions include replacing old plant and equipment, adopting new agricultural practices, or sequestering CO<sub>2</sub> underground or in trees. The CDM converts proposed emissions reductions into tradable Certified Emission Reductions (CER) credits. The credits

are issued only for emissions reductions that would not have occurred otherwise.

How do we know the emissions cuts are reductions that would not have occurred anyway — without any offset payments? This is difficult to determine. For example, India’s largest exporter of Basmati rice, KRBL, was set to receive several hundred thousand dollars’ worth of CDM credits a year for installing a \$5 million generator to produce electricity from rice husks, a renewable energy source. Although the company claimed the biomass generator would not have been installed without funding from the credits, the senior manager at the plant admitted to a reporter for the British Broadcasting Corporation that KRBL “would have done the project anyway.”

According to the nongovernmental advocacy group International Rivers:

- “Almost three-quarters of registered [CDM] projects were already complete at the time of approval,” and thus did not need carbon credits to be built.
- A report by Lambert Schneider of Germany’s Institute for Applied Ecology found that 40 percent of CDM projects registered by 2007 represented “unlikely or at least questionable” emissions cuts.
- David Victor, the head of Stanford University’s Energy and Sustainable Development Program, recently stated that “between a third and two-thirds” of CDM offsets do not represent actual emissions cuts.

The voluntary offset market in the United States faces the same problem

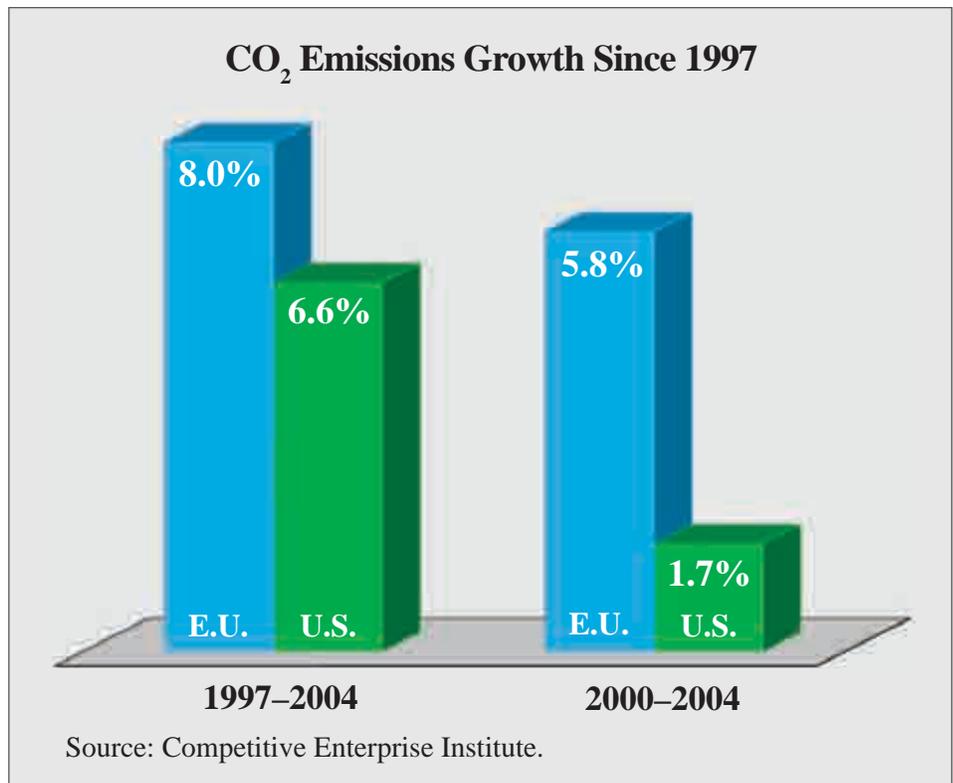
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as CDM projects. For example, to offset all the emissions from the 2007 Academy Awards, the company TerraPass bought offsets from a landfill project in Arkansas. *BusinessWeek* investigators later found that the project would have been undertaken even without offset funding.

**Problem: Measuring Emissions Reductions.** It is inherently difficult to measure the amount of emissions cut by a carbon offset project, and research yields different conclusions. Take carbon offsets for the absorption of greenhouse gases by planting new trees. Estimating greenhouse gas uptake depends on the age of the trees, their growth rate, and climate and soil conditions. Even after all these factors are considered, if the trees do not live as long as 100 years, they will not become net carbon absorbers.

**Problem: Wasting Valuable Resources.** Working within the CDM system is often an inefficient way of cutting emissions. For example, 30 percent of current carbon offset credits are paying for the capture and destruction of trifluoromethane (HFC-23), a greenhouse gas created as a byproduct of manufacturing refrigerant gases. A molecule of HFC-23 has 11,700 times the heat-trapping potential of CO<sub>2</sub>. The carbon offset credits sold to reduce HFC-23 emissions from refrigerant plants in developing countries are currently twice as valuable as the refrigerants those plants produce.

Researchers Michael W. Wara and David G. Victor estimate that HFC-23 emitters could receive as much as \$7.15 billion from the sale of carbon offsets through the CDM. By comparison, at a cost of less than \$155.4 million, companies in developed countries could pay refrigerant plants directly to install technology to capture and destroy the emissions. However, companies have little incentive to invest directly in projects to reduce HFC-23 emissions be-



cause such investments are outside the CDM system, which requires that companies buy certified offsets from sellers in developing countries. Thus, any reductions that result from direct investment would not count against the emissions cuts required by Kyoto. Indeed, some analysts fear that the opposite effect may be occurring. Refrigerant producers could be increasing their HFC-23 output just to sell more carbon offsets to reduce the additional waste gas.

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**Other Approaches.** Carbon credits are not the only way people seek to reduce or offset their own emissions. For example, in competitive U.S. electric power markets, firms

and individuals can voluntarily purchase electricity that is not produced by burning fossil fuels. Since electric power consumption and emissions from fossil-fuel power plants can be measured clearly, it is relatively easy to determine how much greenhouse gas emissions are avoided.

Although Europe’s cap-and-trade program is expensive and has failed to reduce emissions, proposed U.S. climate change legislation would set up a similar program. These proposals typically authorize U.S. firms to trade carbon offsets to meet a percentage of their greenhouse gas emissions cuts.

**Conclusion.** Congress should consider carefully the high costs of carbon offset schemes, and the problems of measuring and verifying reductions of greenhouse gas emissions under such systems, before including similar programs in domestic greenhouse-gas legislation.

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