

Clearing the Air

*The Facts About
Capping and Trading Emissions*



In 1980, rising public concern about the extensive health and environmental impacts of acid rain prompted Congress to commission a ten-year study on its causes and effects. After years of debate and extensive research under the study, Congress established the Acid Rain Program under Title IV of the 1990 Clean Air Act Amendments. The program called for major reductions in electric-generating facilities' emissions of sulfur dioxide (SO₂) and nitrogen oxides (NO_x)—the key components of acid rain—while establishing a new approach to environmental protection through the use of market incentives.

The Acid Rain Program's centerpiece is a market-based system for capping and trading SO₂ emissions. (The program's NO_x control component is more traditional and not the focus of this brochure.) The SO₂ requirements are structured in two phases. Phase I, which began in 1995, limited emissions from the largest, highest-emitting electric-generating facilities. Phase II, which began in 2000, tightened the annual limits on the large plants, and set restrictions on smaller, cleaner plants and all new plants. As of 2001, the program encompassed nearly 2,300 units at 1,000 plants.

The significant environmental progress and cost savings resulting from this nationwide experiment in capping and trading SO₂ emissions have attracted worldwide attention. This brochure explains how and why this system works, clears up some common misunderstandings, and presents the outlook for future programs based on this model.

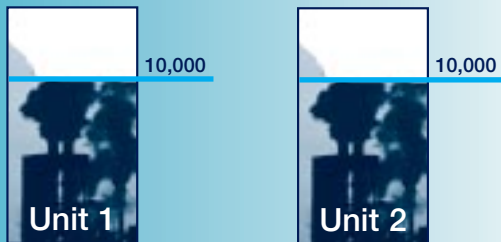
Capping and Trading Emissions: The Concept

BEFORE THE PROGRAM



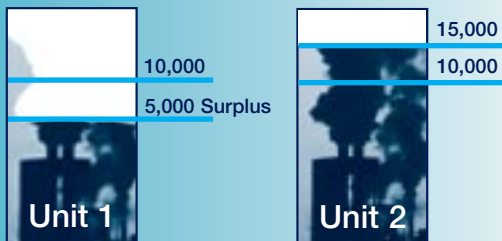
With no reductions required, Unit 1 and Unit 2 each emits 20,000 tons a year.

THE “CAP”



The cap requires a 50 percent cut in emissions—e.g., from 20,000 to 10,000 tons.

EMISSIONS TRADING UNDER THE CAP



If Unit 1 can efficiently reduce 15,000 tons of emissions and Unit 2 can only efficiently reduce 5,000 tons, trading allows each unit to act optimally while ensuring achievement of the overall environmental goal. Unit 1 can hold on to (and “bank”) its excess allowances or can sell them to Unit 2, whereas Unit 2 must acquire allowances from Unit 1 or from another source in the program.

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How It Works

The “Cap” Puts a Ceiling on Emissions

The Acid Rain Program sets a nationwide cap on SO₂ emissions from electric-generating facilities. Already, emissions have been reduced by more than 6.5 million tons from 1980 levels, measuring approximately 10.6 million tons in 2001. By 2010, the program will lower the cap to 8.95 million tons—a 50 percent reduction from 1980 SO₂ emissions.

Emission Allowances Reinforce the Cap

Each allowance authorizes one ton of SO₂ emissions. Limiting the number of available allowances ensures the cap’s integrity. Allowances are allocated among sources based on emission performance standards and representative fuel use. At the end of each year, every source must have enough allowances to cover its emissions for that year. Unused allowances may be sold, traded, or saved (banked) for future use.

Sources Have Many Options for Reducing Emissions

Sources may choose from many alternatives that best meet their needs, including installing pollution control equipment; switching from high-sulfur coal to medium- or low-sulfur coal, fuel blends, or natural gas; employing energy-efficiency measures and/or renewable generation; buying excess allowances from other sources that have reduced their emissions; or using a combination of these and other options.

Monitoring and Penalties Ensure Compliance

An EPA-certified monitoring system at each source continuously measures and records mass emissions of SO₂ to account for every ton of SO₂ emitted. Sources must then retire one allowance for each ton emitted. Those that don’t have enough allowances to cover their annual emissions are automatically fined and must surrender future year allowances to cover any shortfall.



Trade

Why It Works

The Cap Provides Environmental Certainty

Even in the case of high growth in the electricity industry, the cap restricts total emissions. This provides a distinct advantage over traditional command-and-control regulatory methods that establish source-specific emission rates and can't ensure that aggregate emissions don't rise as new sources come on line or as existing sources are used more.

Limiting Allowances Creates Economic Value

A limit on allowances creates scarcity; scarcity ensures economic value for allowances; and value provides incentive to reduce emissions.

Lower Compliance Costs Raise the Environmental Bar

Because a cap-and-trade system allows companies to choose the lowest-cost compliance option, regulators can pursue more ambitious environmental goals for a given expenditure. For example, before Congress agreed to a 10-million-ton reduction goal under the Acid Rain Program, most alternative proposals sought only an 8-million-ton reduction using conventional approaches.

Banking Encourages Early Reductions

By allowing companies to save unused allowances for future use, banking creates a tangible, quantifiable, economic incentive to decrease emissions beyond allowable levels. Early emission reductions result in earlier human health and environmental benefits.

Accurate Monitoring Improves Accountability

Accurate monitoring of all emissions and timely reporting ensure that a ton from one source is equal to a ton from any other source and that the integrity of the cap is maintained. Participating sources must fully account for each ton of emissions according to stringent protocols. The resulting compliance information is unprecedented in its accuracy and comprehensiveness. All data are publicly available on the Internet, providing complete transparency.

State and Local Authorities Retain Flexibility

States and localities may impose stricter limits on sources to address specific local air quality concerns. These limits must be met regardless of a source's accumulated allowances.

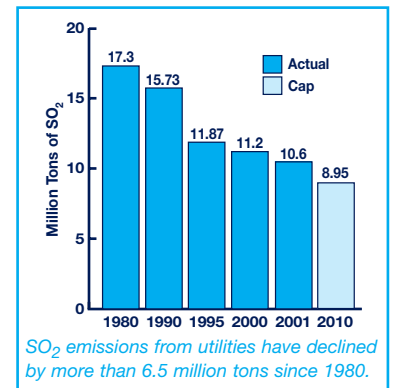
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Because the Acid Rain Program's cap-and-trade system has achieved greater SO₂ reductions than controlling other environmental problems. For example, northeastern states began implementing a Midwest and Southeast will also use this model to address a broader area of ozone transport by using a trading system. Despite the successes and growing use of cap-and-trade programs, the public questions and answers should help clarify these common misunderstandings.

Question Answer

Aren't sources just shifting their emissions around instead of reducing them?

In fact, under a cap-and-trade system, all trading occurs under a nationwide "cap" that represents a reduction in total emissions. The Acid Rain Program requires a 50 percent reduction in total U.S. SO₂ emissions compared to 1980 SO₂ levels—larger than any reduction previously required by the federal government. Already, SO₂ emissions have decreased by more than 30 percent from 1990 levels. And under the NO_x cap-and-trade program that began in 1999, NO_x emissions in the Northeast have decreased by 60 percent from 1990 levels.



The flexibility under a cap-and-trade system isn't about *whether* to reduce emissions. Rather, it's about *how* to reduce them at the lowest possible cost. Sources may buy and sell allowances, but trading is generally only one small component of an overall strategy for meeting emission limits. In fact, the largest polluters have chosen to significantly reduce their emissions before buying allowances from other sources.

Does the Acid Rain Program really address human health risks?

Emission reductions under the Acid Rain Program are significant: EPA projects they will prevent thousands of premature deaths, and the annual human health benefits in 2010 will exceed \$50 billion. In addition, because trading assigns a monetary value to reducing emissions below the allowable limit, sources are choosing to cut their emissions sooner than required, resulting in earlier achievement of human health and environmental benefits.

Doesn't trading result in hot spots (areas of heavy, localized emissions) and higher health risks?

Actually, in addition to the reductions required by the cap, all areas of the country must meet national, health-based, air quality standards that are separate from the Acid Rain Program's requirements. No source may use allocated or purchased allowances to emit more SO₂ than the level specified for protecting human health. Recent analyses show that emissions trading has not adversely affected attainment of air quality standards. In fact, under the Acid Rain Program, the greatest reductions were achieved in the highest-emitting states.

Trade

h earlier than expected and at lower cost to society, it is increasingly seen as a superior option for con- a cap-and-trade program to address regional ozone problems in 1999; numerous additional states in the beginning in 2004; and dozens of countries around the world have agreed to reduce greenhouse gases by debate reveals that some aspects of emissions trading are not fully understood. The following ques-

Question Answer

Isn't the real purpose of emissions trading to save sources money?

While a cap-and-trade system reduces compliance costs, it also creates incentives to reduce emissions below allowable levels, spurring technological innovation and energy efficiency. In the 1990s, scrubber costs dropped by 40 percent, and the sulfur removal efficiencies of scrubbers improved from 90 to 95 percent. Additionally, the cap provides environmental certainty, which is absent in other regulatory programs.

Isn't trading increasing acidity in acid-sensitive lakes?

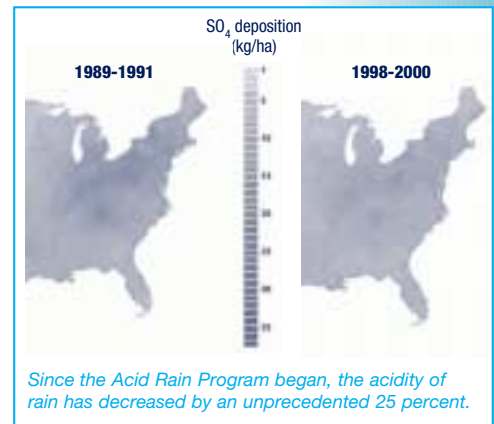
In fact, the early SO₂ reductions that sources chose to make are resulting in faster removal of sulfur from sensitive ecosystems. The delay in recovery of acid-sensitive lakes is more likely due to decades of very high levels of nitrogen deposition.

Aren't older, dirtier sources exempt—or "grandfathered"—from the Clean Air Act?

There are no "grandfathered" sources in the Acid Rain Program. The source of this misconception is the 1977 Clean Air Act, which imposed new-source performance standards on sources built after the Act's passage. Although sources built before 1977 are grandfathered from these standards, these sources are subject to the Acid Rain Program's emission reduction requirements. Large, older sources are among those that have reduced their emissions by the greatest amounts.

Won't the future use of banked allowances undo much of the progress achieved by early reductions?

On average, the Acid Rain Program's Phase I sources emitted about 28 percent less than the allowances allocated to them. During Phase II, which has more stringent emission limits, many utilities seeking low-cost compliance options may turn to their bank of unused allowances. While this may delay the achievement of an annual emission reduction target, the cumulative reductions over the first fifteen years of the program will be identical.



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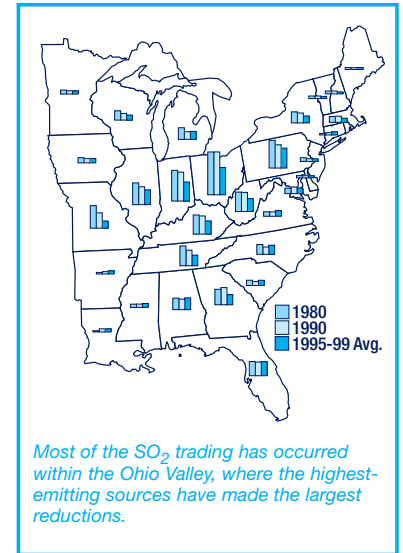
Question Answer

Is restricting emissions trading to within a state's border the only way to protect vulnerable ecosystems?

Actually, from 1995 to 1998 under the Acid Rain Program, more than 80 percent of allowances used for compliance originated from other in-state sources. Additionally, because the wind carries emissions across state borders, preventing sources from trading outside of their states doesn't appear to have any measurable environmental benefit. In fact, it could harm the competitiveness and profitability of in-state sources, which could result in higher compliance costs and higher consumer utility bills. Preventing sources from trading at all would remove any incentive for earlier or deeper in-state reductions. The most effective way to protect sensitive ecosystems is to further reduce cap levels.

Are all emission trading programs the same?

Not all emission trading programs have the same features. Critical features are the cap, accurate and complete measurement of emissions, and substantial and automatic penalties for noncompliance. Although a trading program cannot work in every circumstance, one with these features can be a very effective tool.



**See www.epa.gov/airmarkets
for more information on the
Acid Rain Program and other
capped trading programs.**

Trade

Moving Forward

During the first phase of the Acid Rain Program, SO₂ emissions were reduced further, faster, and cheaper than expectations, resulting in significant human health and environmental benefits over large areas of the country. However, while the program is achieving the goals of the 1990 Clean Air Act Amendments, air pollution continues to degrade human health and the environment, compelling additional reductions.

Additional Emission Reductions Are Necessary

The Acid Rain Program has enjoyed an unusually high level of emission reductions and near-perfect compliance. However, it is becoming increasingly clear that the program's emission targets may not be sufficient to achieve its environmental goal of ecosystem recovery. For example, some Adirondack and other sensitive ecosystems remain acidic, and visibility in the East, including the Great Smokies, remains impaired. Scientists believe that emissions from electric generating facilities that cause acid rain must be reduced by two-thirds or more beyond current requirements to allow ecosystems to recover. Also, the relative contribution of sources outside the power sector is increasing as emissions from power generation are decreasing.

Cap and Trade Will Be Important to Future Cost-Effective Reductions

The success of the Acid Rain Program has spurred the development of numerous cap-and-trade programs based on this model, from the regional to the international level. In addition to the domestic programs already planned or in progress, Congress is considering broader application of cap-and-trade programs. The flexibility and cost savings associated with cap-and-trade programs enable policymakers to consider approaches that will more expeditiously and cost-effectively address the human health and environmental problems caused by air pollution.



“We should build on the successes of the past ten years, particularly the Acid Rain Program’s cap-and-trade approach, which—through cost-effective, market-based approaches—has shown that environmental and economic interests can be aligned, rather than at odds.”

—Ken Colburn, New Hampshire Department of Environmental Services

“Cap-and-trade programs...will tend to create incentives for the dirtiest plants to clean up the most, as the per-ton cost of emission reductions may be expected to be the least....[The] data show that, if anything, trading may be expected to cool hot spots and not create them.”

—Environmental Law Institute

“The superior environmental and economic results of...the SO₂ program are precisely what should have been expected of a program that matched an explicit emissions limit with a market that turned pollution reductions into marketable assets.”

—Environmental Defense

“The flexibility of the trading program has encouraged utilities to capitalize on advantageous trends, such as changing fuel prices and technological innovation, that might have been delayed or discouraged by traditional regulatory approaches.”

—Resources for the Future

“Market-based incentives also clarify the environmental debate for the general public because they focus on environmental goals....”

—Robert Stavins et al., Harvard University

“EPA deserves significant credit for resisting opportunities to review and approve compliance and trading decisions by private parties and for focusing instead on the integrity of emissions monitoring and on a strict, no-excuse, banker-type accountability for emissions and allowances.”

—Denny Ellerman et al., Massachusetts Institute of Technology