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SO₂ auction shows power of markets

They don't have trading pits in Chicago for sulphur dioxide (SO₂) or vast arcades for environmental derivatives. The talk on the floor centres around the potential impact of foot-and-mouth disease on grain and animal prices, or whether the Dow Jones Industrial Average has bottomed.

But at a press conference in the boardroom at the Chicago Board of Trade (CBOT) and by teleconference in Washington DC and Atlanta, Georgia, there's a genuine interest in the outcome of the ninth annual auction of SO₂ allowances conducted by CBOT on behalf of the Environmental Protection Agency (EPA).

The 1990 Amendments to the Clean Air Act provided the enabling legislation for the 'cap and trade' programme designed to curtail US emissions of pollutants that cause acid rain in the US and Canada. Title IV of the Amendments provided the basis for two separate phases of implementation. The first began in 1995. Following instructions established by Congress, the EPA allocated emissions allowances to the 110 highest emitting power plants, affecting 263 combustion units. Each year the plants are required to cut aggregate emissions to conform to steadily declining quantified emission limits. The second phase of the programme began in January 2000. It extended the limits to include another 2100 units and the national emission cap was set at approximately 9 million tons. This represented a 50% reduction from the 1980s.

It is well documented that sulphur emissions fell faster than required and positive conclusions from early scientific impact reports have recently been confirmed. Importantly, the evidence of economic success is also overwhelming.

The passage of the legislation depended on the hotly debated forecasts of the price of allowances. Table I presents a sample of some of the forecasts of Phase I prices.

It is important to emphasise that while the optimistic projections of Phase I prices were at or just below \$300, many predicted that allowance prices would double by Phase II. Yet the results of the first EPA annual SO₂ allowance auction, conducted by the CBOT in 1993, had a spot market clearing price of just \$131. The results for the next five auctions further confirmed that early forecasts were significantly higher than observed prices. The apologists continued to assert that the early forecasts for Phase I were correct, and that they would ultimately be proven right when we entered Phase II. In fact, allowance prices in the 1999 auction reached \$207. The chart shows the history of spot and seven-year advance market clearing prices in the annual auctions.

Table I. Pre-1992 forecasts of Phase I SO₂ allowance prices

| Source | Price forecast (\$/ton) |
|-----------------------------------|-------------------------|
| United Mine Workers | 981 |
| Ohio Coal Office | 785 |
| Electric Power Research Institute | 688 |
| Sierra Club | 446 |
| American Electric Power | 392 |
| Resource Data International | 309 |

Source: Hahn and May, *The Electricity Journal*, March 1994

While the spot market clearing prices from the auction have remained consistent with prices in the private market, the advanced 'forward' auctions have revealed an interesting shift in recent years. Between 1993 and 1998, the average spread between the spot market price and the forward market price has been tight at around \$6. However, in the past three years, this differential has risen significantly to \$57 on average. A low forward price for allowances may be due to uncertainty concerning regulation or a forecast that mitigation will be cheaper later in Phase II.

The success of the SO₂ programme sup-

ports the argument that its core elements should be applied to carbon trading. Clear rules on emissions monitoring and penalties for non-compliance, unimpeded trading, fully fungible trading instruments and transparent public-private partnerships are fundamental in the creation of a carbon market.

Already, voluntary initiatives such as the Chicago Climate Exchange are harnessing the successes of the SO₂ programme in the design of a carbon dioxide (CO₂) trading programme. This is further supported by recently proposed cap-and-trade and carbon biomass sequestration legislation introduced by both Republicans and Democrats in the US House and Senate, as well as domestic trading programmes in Europe.

These efforts are just precursors to a regulated CO₂ trading programme. The SO₂ programme has demonstrated the success of emissions trading in the US. A CO₂ trading programme can bring similar success on a global scale.

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SO₂ allowance clearing prices at EPA/CBOT annual auctions, 1993-2001

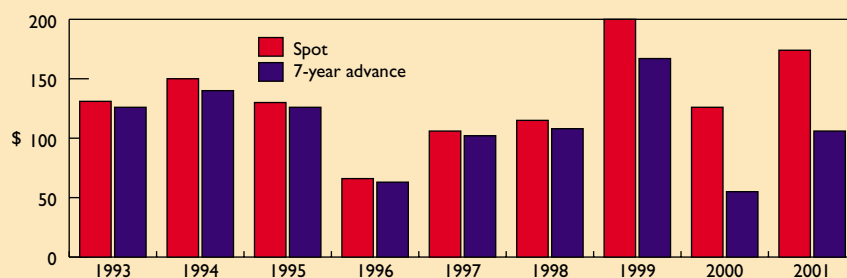


Table 2. 2001 acid rain allowance auction results

| I. Allowances available for auction | | |
|-------------------------------------|--------------|------------------------|
| Origin of allowances | Spot auction | 7-year advance auction |
| EPA | 125,000 | 125,000 |
| Privately offered | 2,788 | 2,388 |
| Total | 127,788 | 127,388 |

| II. Spot auction results | | | |
|--------------------------|------------------|-------------------|----------------------------|
| Allowances | Number of bids | Number of bidders | Bid price (\$) |
| Bids for: 480,995 | Successful: 14 | Successful: 12 | Highest: 225.00 |
| Sold: 127,788 | Unsuccessful: 71 | Unsuccessful: 15 | Clearing: 173.57 |
| | Total: 85 | Total: 27 | Lowest: 105.00 |
| | | | Average (weighted): 174.97 |

| III. Seven-year advance auction results | | | |
|---|------------------|-------------------|----------------------------|
| Allowances | Number of bids | Number of bidders | Bid price (\$) |
| Bids for: 355,500 | Successful: 6 | Successful: 1 | Highest: 115.07 |
| Sold: 127,388 | Unsuccessful: 14 | Unsuccessful: 4 | Clearing: 105.72 |
| | Total: 20 | Total: 5 | Lowest: 30.00 |
| | | | Average (weighted): 110.75 |

Source: US Environmental Protection Agency, Chicago Board of Trade