Global Greenhouse Emissions
TRADER

A newsletter dedicated to climate change abatement and greenhouse gas emissions trading

UNCTAD and Earth Council to launch Greenhouse Gas Trading Policy Forum

Frank Joshua

After several years of research by UNCTAD into the design and implementation of international greenhouse gas emission trading systems (published in 7 Volumes between 1992 and 1996), UNCTAD and Earth Council have agreed to launch a Policy Forum on Greenhouse Gas Emissions Trading. The Forum will provide competent institutional support for a process of consultation, coordination and action among governments and other parties interested in taking timely steps towards the establishment of an international GHG emissions trading system. The Forum will assist interested countries to examine the technical issues and practical steps involved in setting up a limited-scale international GHG trading system, possibly starting with a few interested countries, with allowances based on CO_2 from major fixed sources, and with adequate provisions for the expansion of the trading system to include additional countries, gases, sources and sinks.

Both UNCTAD and Earth Council see the Forum as a timely move in view of the progress to date in the negotiations on a protocol to the Framework Convention on Climate Change. International GHG emissions trading now figures prominently among the policies and measures which will be available to governments to enable them to implement legally-binding emission limitation and reduction obligations in accordance with the Kyoto Protocol. However, the introduction of a viable and effective GHG trading system will require a high degree of coordinated action among participants in the trading programme to ensure that a coherent, compatible and stable market emerges.

Emissions trading has proven to be an effective tool for achieving environmental goals at minimum cost. A market for greenhouse gases could help to mobilize private capital for investment in poorer countries.

The Forum will consist of two tracks: Firstly, an Informal Study Group of governmental experts will consider the key issues and practical steps involved in implementing an international GHG trading system. This Group will consider specific matters such as the allocation of allowances and budgets, emissions monitoring, allowance issuance and trading, certification procedures, regulatory regimes, compliance, enforcement, reporting, data-gathering and dissemination, technical assistance, etc.. Secondly, an Expert Group on Market Issues, will seek to harness the knowledge and experience of the private sector in areas such as organizing and administering the trading markets, internal regulation, supervision and control over trading organizations, trading contracts, compliance, metering, reporting, data services, software systems development, technical assistance, etc.

The Forum will be serviced by UNCTAD's Greenhouse Gas Emissions Trading Project. Mr. Maurice Strong, Chairman of Earth Council, will act as Convener of the Forum. The first session of the Forum is tentatively scheduled to take place on 19/20 June 1997 in Chicago. Several leading Annex1 countries, including countries in transition, and selected non-Annex 1 countries will participate in the work of the Forum.

***Frank Joshua** is Head, Greenhouse Gas Emissions Trading, UNCTAD Secretariat, Geneva.*

Earth Council's support for the Policy Forum on Greenhouse Gas Emissions Trading

Maurice Strong

The Earth Council was founded subsequent to the 1992 Earth Summit, as a non-profit organization dedicated to monitoring progress and following up on implementation of the Rio accords and promoting sustainable development. At that time, we envisioned our role to include sponsorship of path-breaking initiatives like the Policy Forum on Greenhouse Gas Emissions Trading, which is in line with one of Rio's outcomes, the Framework Convention on Climate Change and its endorsement of activities jointly implemented as one of the mechanisms

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that could be used to stabilize concentrations of greenhouse gases. The Earth Council sees this Forum as a vital instrument for helping countries develop cost-effective policies for reducing greenhouse gas emissions. We are pursuing this initiative, in collaboration with UNCTAD and with the support of Chicago-based Centre Financial Products Limited, because we believe in the need to accelerate the policy implementation process associated with the introduction of a GHG trading system.

I believe that a powerful role can be played by the private sector as a source of innovation and action in promoting market-based climate protection policies and mechanisms. Given the large differences in the marginal abatement costs for carbon emission reductions and carbon sequestration between developed and developing countries, there is a significant economic incentive to both developed and developing countries in carbon trading. Trading can result in the transfer of both advanced environmentally friendly technologies and a resource rent to developing countries while reducing costs in developed countries. Moreover, emissions trading schemes are not new—the sulphur dioxide trading programme involving power plants in the United States has provided some needed clarity. Both emissions and compliance costs have come down substantially and are transparent.

I believe the climate change problem must be attacked from many fronts, and several United Nations agencies, including UNCTAD, have been very effective already. However, my sense is that the private sector will have to take the lead in many areas. Private resources must be brought to bear since government budgets are strained. In the process of developing a market mechanism, it is imperative that we employ the expertise of those in the public, private and NGO sectors who have been instrumental in helping assure the success of other emissions trading programmes.

The Earth Council sees a potentially strong relationship between market-based climate protection policy and development issues. We need to do whatever we can to make sure developing economies can use the cleanest possible energy technologies. There may be viable ways to use an emissions trading market as a tool for helping with resource transfer. Over time, the emissions trading market should be expanded in a way that recognizes that per capita emissions in developing countries are relatively low, and that many countries are providing environmental services to the entire planet but are not being justly compensated for those services. We all benefit from healthy forests and biodiversity. The international system should work to reward those who protect these globally important resources.

Maurice Strong is Chairman of the Earth Council, Executive Coordinator for UN Reform, and Senior Advisor to the President of the World Bank. Mr Strong was Secretary-General of the 1992 United Nations Conference on Environment and Development ('The Earth Summit').

Climate change talks continue towards Kyoto

Doug Russell

Negotiations are ready to begin in earnest in the eight remaining months before the Kyoto meeting of the Conference of the Parties to the UN Framework Convention on Climate Change. With the deadline for reaching agreement looming, negotiators from around the world met in Bonn on 3–7 March to lay out proposals for the Protocol or other legal instrument to be agreed to in Kyoto this December.

The week was highlighted by the European Union proposal regarding emission targets (QELROs). Following a meeting of EU Environment Ministers in Brussels, an agreement emerged on allocation of caps among themselves, resulting in a European-wide reduction target of –10 per cent below 1990 by 2010 for a basket of three greenhouse gases, namely carbon dioxide, methane, and nitrous oxide. They further suggested, that if all other members of the Annex I group were to agree as well, the EU would go to –15 per cent by 2010.

Other Annex I countries remained cautious. While many seem willing to support legally binding targets, numerous proposals were advanced to allow for differentiated commitments based on unique national circumstances and to provide flexibility on how targets may be reached. Most non-European countries have yet to disclose the numbers they have in mind.

Within this context, emissions trading and joint implementation have risen to the top of the list of 'flexibility providers'. Interest continues to run high as witnessed by the plethora of reports and studies made available at the meeting by business and environment groups. While intuitively recognizing the long term environmental and economic value of having emissions trading and joint implementation recognized in the Kyoto Protocol, the challenge remains to design and implement a working system that is verifiable, functional and cost effective.

Norway has suggested a form of emissions credit trading involving transfer of 'carbon equivalent emissions reductions' in return for cash among Annex I Parties and those non-Annex I countries who choose voluntarily to participate. Russia hints at this as well in their proposal which opens up joint implementation to a 'group of Parties'. The Swiss propose that Parties could fulfil up to 50 per cent of their commitments via joint implementation

once the pilot phase on activities implemented jointly (AIJ) ends in 2000 and agreement is reached on the 'modalities for emissions crediting'. Meanwhile, the USA is standing firm behind its proposal for emissions trading between Annex I countries and JI with credits between developing countries and Annex I Parties.

Negotiations are about where one would expect them to be at this juncture. Virtually all positions are on the table, now in one text. The next session, scheduled to begin in Bonn on July 30th, heralds the beginning of real negotiations. Look for:

- increased calls for the non-EU OECD countries to reveal what targets they are willing to put on the table
- more OPEC resistance to the Protocol
- USA and Norwegian leadership on emissions trading and joint implementation, and
- increased scrutiny by ENGOs and business NGOs.

Doug Russell *is a Principal of Global Change Strategies International Inc., Ottawa, Canada. He was formerly co-head of Canada's delegation to the UNFCCC negotiations, and Chairman of the OECD/IEA Annex I Experts Group of the FCCC.*

The US SO_2 allowance programme

Brian McLean

(This article is the first of two installments on the US sulphur dioxide allowance programme).

The Sulphur Dioxide (SO_2) Allowance Programme, created under Title IV of the Clean Air Act Amendments of 1990, represents a radical departure from the traditional command and control approach to environmental policy and regulation and from previous emissions trading efforts. It contains the first statutorily-mandated, national, market-based approach to environmental management. Its implementation, therefore, provides a unique opportunity to assess the effectiveness of such an approach. Although initial emissions reductions were not required until 1995 with full implementation not until the year 2010, the first six years since enactment provide a wealth of experiences from which some early lessons can be learned about designing and implementing market-based approaches for protecting the environment.

Goals and results

For the first phase of the programme (1995–99) only 263 boilers out of the more that 2000 fossil fuel-fired boilers and combustion turbines used to generate electricity in the United States were subject to emissions limitations. However, because of provisions in the law which allowed Phase II combustion units to voluntarily participate in Phase I, 182 additional units, or a total of 445 units were affected in 1995, the first year of the programme.

In 1995, the 445 Phase I affected utility units reduced their SO_2 emissions to 5.3 million tons from their 1980 level of 10.9 million tons, with most of that reduction occurring in 1995. Since 8.7 million allowances were issued to these sources for 1995, they emitted 3.4 million tons (or 39 per cent) below their allowable emission level for that year. The 5.6 million ton reduction from Phase I utility units coupled with a reduction of more that 2 million tons from non-utility sources led to a total reduction in SO_2 emissions of 7.9 million tons from the 1980 level.

The expected costs of the programme have declined since it was debated in Congress. Early estimates of the cost ranged from US$374 to US$981 per ton during Phase II. Tracking allowance prices, we see that for the past year the cost of buying a ton of SO_2 reduction (either for Phase I of Phase II compliance) has been less than US$100.

In 1990, total annualized costs were estimated by EPA to be US$5 billion by the year 2010 if no trading were permitted, and US$4 billion per year with

Forthcoming events

May 22, Washington, D.C., USA
Offsets Forum, sponsored by the Center for Clean Air Policy, Washington, D.C.
Contact: Christine Vanderlan,
Tel: (1) 202 408 9260 Fax: (1) 202 408 8896

May 22–23, Oslo, Norway
Climate Change Negotiations—Burden Sharing and Cost-effective Implementation Mechanisms and Protocols, organized by the Nordic Council of Ministers
Contact: Hege Lysaker, Hovik, Norway,
Tel: (47) 6 757 8810 Fax: (47) 6 57 8805

May 26–29, 1997, Vancouver, Canada
Technologies for Activities Implemented Jointly, organized by the International Energy Agency (IEA) Greenhouse Gas R&D Programme, United Kingdom
Contact: Dr. Pierce Reimer,
Tel: (44) 1242 680 753 Fax: (44) 1242 680 758
e-mail: aij@green.demon.co.uk

June 12–13, Washington, D.C., USA
Meeting of Invited Experts on the Design of a Domestic Greenhouse Gas Emissions Trading System in the United States, sponsored by the Center for Clean Air Policy.
Contact: Tim Hargrave, Washington, D.C.
Tel: (1) 202 408 9260 Fax: (1) 202 408 8896

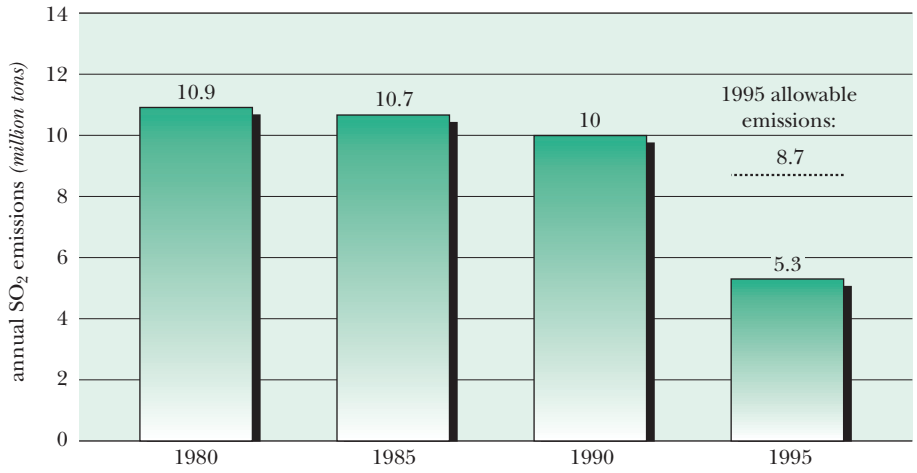
June 19–20, Chicago, USA
Policy Forum on Greenhouse Gas Emissions Trading, organized by UNCTAD and the Earth Council.
Contact: Frank Joshua, UNCTAD, Palais des Nations, 1211 Geneva 10, Switzerland.
Tel: (41) 22 917 5834/5831 Fax: (41) 22 907 0274
e-mail: frank.joshua@unctad.org

July 27–August 8, Bonn, Germany
Seventh Session of the Ad Hoc Group on the Berlin Mandate; Sixth Session of the Subsidiary Body on Scientific and Technical Advice; and Fifth Session of the Subsidiary Body on Implementation.
Contact: UNFCCC, Bonn, Germany
Tel: (49) 228 815 1000 Fax: (49) 228 815 1999
e-mail: secretariat@unfccc.de

October 20–31, Bonn, Germany
Eighth Session of the Ad Hoc Group on the Berlin Mandate
Contact: UNFCCC, Bonn, Germany
Tel: (49) 228 815 1000; Fax: (49) 228 815 1999
e-mail: secretariat@unfccc.de

December 1–13, Kyoto, Japan
Third Conference of the Parties to the FCCC
Contact: UNFCCC, Bonn, Germany
Tel: (49) 228 815 1000 Fax: (49) 228 815 1999
e-mail: secretariat@unfccc.de

SO_2 emissions (445 Phase I affected utility units)



unrestricted trading. These estimates were considered low by the utility industry. In 1994, the programme was reviewed by the US General Accounting Office and compliance costs were re-evaluated. At that time, the programme without trading was estimated to cost US$4.9 billion per year by 2010, but only US$2 billion per year if full trading occurred. This new estimate placed the cost of the programme at less than half the cost of a programme without trading.

The lower than expected compliance costs have become the focus of attention, both to understand the SO_2 programme better and, also to understand the implications of applying this approach to other environmental problems. There appear to be several explanations for the low compliance costs. First, the allowance system facilitates competition across all emission reduction options. Flue gas desulphurization, a major control technology option, costs 40 per cent less than before the 1990 Clean Air Act; removal efficiencies have also increased from 90 per cent to 95 per cent or more. Productivity at both low and high sulphur coal mines has continued to improve at rates exceeding 6 per cent per year, and rail transport tariffs, which had declined somewhat before the Clean Air Act, dropped by 40 per cent after the Act was passed.

Second, market systems with their competition and flexibility provide incentives for innovation. Companies are experimenting with fuels for which their boilers were not designed and blending fuels to minimize SO_2 emissions. Also, coal suppliers are 'bundling' allowances with coal sales to increase their attractiveness. Market instruments, like options and swaps are being employed to reduce risk.

Third, in addition to trading, which allows the units with the lowest compliance costs to bear the burden of control, the banking provision has provided considerable flexibility in timing emissions reductions, minimizing operational disruptions and allowing capital expenditures to be delayed. Finally, a market system can reveal the true costs of compliance, informing the market participants, who, in turn, can make cost-effective compliance choices.

It is, of course, the revelation of compliance costs through the allowance price that has prompted the question of why compliance costs are so low. But the low cost being revealed only a few years after the high estimates were made raises other important questions. Why were the estimates of almost all economists and analysts so high? How can we do a better job of predicting costs for future programmes? And what weight should estimates by the regulated industry be given in debating and designing future programmes?

Besides being less expensive for sources to meet their emissions reduction obligations, the programme can be less expensive for the government to administer. In the first five years of the SO_2 allowance programme (which included programme development and the first year of operation), government expenditures totalled less than US$60 million out of an estimated total of US$3.5 billion for air pollution control activities. Approximately 15,000 people work on air pollution control for federal, state, and local governments. Because the allowance programme is heavily automated, less than 150 workyears per year are expected to be needed to operate the programme. It is likely that about three-quarters of that workforce would focus on auditing the performance of emissions monitors and quality assuring data reports. The remainder would handle all other functions including permitting, allowance transfers, allowance auctions, data system operations and enhancements, end-of-year allowance reconciliation, programme evaluation, and general administration.

Key Features

Goals

The difference between the SO_2 allowance programme and previous air pollution control efforts begins with how the goals and source obligations are stated. To achieve the emission reduction goal for utilities of 8.5 million tons from their 1980 level of 17.5 million tons, the programme objective was established as a maximum annual emissions level (or permanent 'cap') of 8.95 million tons. To constrain emissions to 8.95 million tons, only 8.95 million allowances (the legal authorization to emit a ton of SO_2) would be issued each year, and a source would have to hold an allowance for each ton it emitted. This is the first air programme to limit total emissions. This 'cap' on emissions not only ensures the environmental integrity of the programme, it also encourages the lowest possible emissions and highest possible efficiency from facilities.

Trading

Instead of the credits being calculated as reductions (either projected reductions, or after they occur) as in previous trading programmes, the trading unit is defined

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Recent news

US Proposal for Kyoto Protocol,
2 April 1997, Washington, D.C.

In January 1997 the United States released a 'draft protocol framework' as part of its contribution to the negotiations on a Protocol to the Framework Convention on Climate Change. The framework proposal, presented last March to the climate negotiations by Ambassador Mark Hambley, chief US representative to the treaty negotiations, is predicated on the following core ideas:

- legally binding emissions targets (in the form of an emissions budget);
- measurement, reporting, and compliance (key to the legally binding character of the agreement);
- emissions trading and joint implementation (as fundamental elements of a flexible and cost-effective regime); and
- advancing the implementation of commitments by all parties (developed and developing).

Legally binding emissions budgets

Building on the concept of cumulative and averaged emissions, the US proposal establishes an 'emissions budget' i.e. the total amount of greenhouse gases that can be emitted over a period of several years. Multiple emissions budget periods are proposed, including a second period in which emissions are equal to or less than the first period. For a given period, each developed country party would be allocated an emissions budget. The budget would be the same for all Annex I Parties (the so-called 'developed' countries, including Russia and Eastern Europe, designated as 'Annex A'). Neither the size of the budgets nor the duration of the budget periods have been identified as yet.

Parties would be allowed to 'bank' for future use emissions not used during the given period. This provision would allow a party to take more aggressive actions and reduce emissions beyond the level required during one budget period—and save those reductions for use at a future time. In this way, the instrument both provides an incentive to take early reduction actions and offers each party the opportunity to maximize the cost-effectiveness of its own reduction programme. The US believe it is appropriate to allow parties to 'borrow' a very limited amount of emissions (with a penalty) from a subsequent period. The penalty (automatically applied to any borrowing party) provides the first step in a non-compliance procedure. Borrowing also makes it possible for a party to plan its emissions trajectory beyond the established budget period.

A new category of parties is proposed to encourage rapidly developing countries to voluntarily adopt emissions budgets. This group, designated as 'Annex B', would have a different budget than that assigned to Annex A countries. Membership in Annex B would be voluntary.

Measurement, reporting and compliance

The US proposal establishes procedures to ensure adequate measurement, reporting, review and compliance. A binding agreement is only meaningful if it contains appropriate reporting and compliance mechanisms. The proposal calls for Annex A and B countries to set national systems for measuring emissions accurately, achieving compliance, and ensuring enforcement. It also obligates Annex A and B countries to provide annual reports on measurement and compliance and enforcement efforts for the relevant budget period and to make these available to the public. Consequences of non-compliance could include denial of emissions trading/joint implementation rights or the loss of voting and other decision-making rights.

Emissions trading and joint implementation

The US proposal seeks to minimize the costs associated with emissions reductions. To this end, it includes both flexibility in setting the target year (through the use of a multi-year budget), and flexibility through allowing emissions trading and joint implementation. Emissions trading, as described in Article 6 of the US proposal, is only allowed between parties that each have budgets and that are in compliance with their measurement and reporting obligations under the agreement. While the private sector may engage in trading (and we expect most trades to take place through private sector activity), the parties themselves retain full responsibility for the emissions traded. Compliance with budget obligations remains with the government.

Because the US proposal contains substantial detail on reporting and monitoring obligations for Annex A Parties (required to insure compliance with the budget even in the absence of trading), there need be no additional complex scheme to monitor trades. It becomes largely an accounting exercise. But the benefits of trading are enormous—trading reduces the cost of compliance substantially, and equalizes the incremental cost to all annex A parties of the next unit of greenhouse gas emissions reductions.

The US proposal distinguishes joint implementation from emissions trading. Emissions trading should be allowed only between parties with budgets, and would be based on existing reporting and monitoring already required. Joint implementation, on the other hand, would be allowed between parties with budgets and those without budgets (e.g., developing countries). Emissions reductions created through joint implementation projects could then be traded.

Advancing implementation of Article 4.1 (on the commitments of all parties)

The US proposal also calls for all parties to continue to advance the implementation of commitments such as the identification and adoption of 'no regrets' measures to mitigate net greenhouse gas emissions. These measures, such as installing energy-efficient lighting systems, have additional benefits including long-term cost savings and reduced local air pollution. Article 4.1 (of FCCC) also sets an obligation for all parties to inventory and report on their emissions. However, neither the timing nor the frequency of these inventories have been set; the US suggest that the period be annual, to provide the international community with an accurate baseline for its total emissions levels.

Source: USIS Geneva

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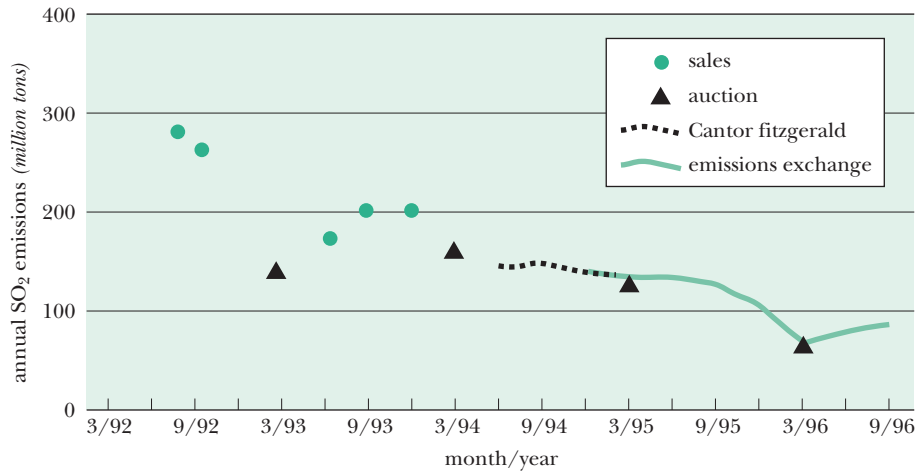
as an allowance, i.e., one ton of allowable emissions. Allowances are issued to sources based on a series of formulas reflecting recent historical utilization and desired emissions rates, generally issued in perpetuity, and before the trading of allowances or emission reductions begins. In this way, the cost of the trading infrastructure is moved up front. To maintain the emissions cap, new sources are not allocated allowances but must acquire them from existing allowance holders or through the government auctions (which sell 2.8 per cent of allocated allowances). To promote the use of market intermediaries and to create an incentive for early compliance with the emission reductions, allowances may be traded to any party and may be banked for use in subsequent year, but may not be brought forward for use in an earlier year.

SO_2 allowances prices



Emissions measurement

Along with the improvements in the allowance market is the creation of a common measurement metric through continuous emissions monitoring systems (CEMS), with quarterly reporting of hourly emissions to EPA. After the end of each year the total number of tons of SO_2 emitted by each boiler are then deducted from allowances contained in each electric utility unit's account, with any excess allowances rolled into the next year's account.

Permitting

Because all emissions are measured and no detailed compliance schedules are needed, permit applications are greatly streamlined compared to traditional operating permits. For the allowance programme, the applicant must simply provide the name of the plant, commit to measure emissions, and commit to hold sufficient allowances to cover annual emissions. These changes dramatically reduce the cost of permitting for both the source and the government and increase the likelihood of sources seeing the allowances as a full compliance alternative.

Automatic non-compliance penalties

Coupled with the requirements to measure emissions accurately is the mandated, immediate penalty for non-compliance. If annual SO_2 emissions exceed the number of allowances held at the end of the year, statutory penalties of US$2000 per ton exceeded (indexed to inflation) and an offset of one allowance per excess ton is imposed automatically, thereby assuring that the environmental goal is met.

Default limits

If EPA failed to put implementing regulations in place, emission limitations stated in the law would apply to every source (with no reallocation of emissions limitations possible). Coupled with the automatic non-compliance penalties, this provision encouraged the industry to support the timely promulgation of regulations to avoid the more costly statutory fallback. The requirement to measure all emissions and the automatic non-compliance penalties and default limits were not part of the existing air pollution control infrastructure. They not only are critical to the credibility and efficiency of the emissions trading aspect of the allowance programme, but they enhance its environmental integrity.

Other protections

Because emissions trading allows for flexible emissions patterns, a common concern with programmes of this type is that a 'hot spot' of emissions will occur through trading, impairing the health or welfare in the local area, even as the larger goal of regional emission reductions is attained. All utilities regulated under this programme are also required to comply with all other requirements of the Clean Air Act, in particular the requirement to meet the health-based National Ambient Air Quality Standards, New Source Performance Standards, and Prevention of Significant Deterioration provisions. These requirements are independent of the trading programme and cannot be circumvented through purchase of allowances.

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In our next issue:
SO_2 programme implementation: lessons learned

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