

Discussion Paper

**INECE-Environment Agency (England and Wales)**

**Conference on Compliance and Enforcement for**

**Emissions Trading Schemes**

*Worcester College, Oxford, England  
16 - 18 March 2004*

*Prepared by  
INECE Expert Workgroup on  
Emission Trading*



<b>1</b>	<b>INTRODUCTION TO THE GOALS OF THE WORKSHOP .....</b>	<b>3</b>
<b>2</b>	<b>BACKGROUND ON EMISSIONS TRADING SCHEMES.....</b>	<b>3</b>
2.1	Existing Cap and Trade Markets .....	4
2.2	The European Union Emissions Trading Scheme.....	4
<b>3</b>	<b>ESTABLISHING SUCCESSFUL COMPLIANCE AND ENFORCEMENT PROGRAMS TO SUPPORT EMISSIONS TRADING.....</b>	<b>5</b>
3.1	Develop Enforceable Program Requirements.....	5
3.2	Identify the Regulated Community .....	5
3.3	Promote Compliance within the Regulated Community .....	5
3.4	Monitor Compliance .....	5
3.5	Develop a Methodology to Respond to Violations .....	6
3.6	Evaluate Successfulness and Weakness of the Program .....	6
<b>4</b>	<b>WORKSHOP STRUCTURE AND PURPOSE .....</b>	<b>7</b>
<b>5</b>	<b>ABOUT INECE .....</b>	<b>7</b>
	<b>APPENDIX A: QUESTIONS TO CONSIDER PRIOR TO THE WORKSHOP .....</b>	<b>8</b>
	<b>APPENDIX B: UK EMISSIONS TRADING SCHEMES (UK ETS).....</b>	<b>9</b>
	<b>APPENDIX C: USEPA CLEAN AIR MARKETS PROGRAM .....</b>	<b>12</b>
	<b>APPENDIX D: THE KYOTO PROTOCOL AND THE MARRAKECH ACCORDS.....</b>	<b>13</b>
	<b>APPENDIX E: THE USE OF TRADABLE PERMITS IN COMBINATION WITH OTHER ENVIRONMENTAL POLICY INSTRUMENTS.....</b>	<b>14</b>
	<b>APPENDIX F: ADDITIONAL ONLINE RESOURCES .....</b>	<b>16</b>

**INECE-Environment Agency (England and Wales)  
Conference on  
Compliance and Enforcement for Emissions Trading Schemes<sup>1</sup>**

**1 INTRODUCTION TO THE GOALS OF THE WORKSHOP**

Since the Intergovernmental Panel on Climate Change published its findings on the significant negative impact that anthropogenic activities are having on the Earth's climate system,<sup>2</sup> countries have been exploring methods to efficiently and cost-effectively reduce carbon dioxide and other greenhouse gas (GHG) emissions.

Emissions trading, which is one such method, is a market-based instrument that allows emitters (countries, companies, or facilities) to buy emissions from or sell emissions to other emitters.<sup>3</sup> Emissions trading programs reward those with low emissions by defining a level of permissible emissions and a market price for unused units.

Strong enforcement mechanisms are critical to the success of trading schemes. The development of a comprehensive strategy to ensure full compliance with emissions reduction commitments and with trading regulations is a necessary first step.

This Workshop will bring together experts from around the world to share experiences on the compliance and enforcement aspects of trading schemes and develop strategies to strengthen enforcement and compliance practices as they relate to emissions trading market systems.

**2 BACKGROUND ON EMISSIONS TRADING SCHEMES**

Emission trading is at the forefront of discussions of greenhouse gas reduction techniques. The recent European Council Directive 2003/87/EC,<sup>4</sup> the United States' Clean Air Act,<sup>5</sup> and the Kyoto Protocol<sup>6</sup> all authorize emission trading as a means to comply with emissions reduction obligations. Emission trading market strategies have received wide acceptance from both industry, because of the potential for financial rewards for emissions reductions, and from governments, because of the cost-effective regulatory structure emissions trading provides.

In an emissions trading program, the government establishes a market by limiting emissions, thereby creating a value for the right to emit. This right to emit becomes a tradeable commodity, usually referred to as "tradeable permits," "emission allowances," or "emission credits." Companies may buy these tradeable permits for compliance purposes. However, in many emissions trading schemes, traders, environmental groups, or others may also purchase the permits. For companies participating in an emissions trading program, any excess emissions over the amount of permits held results in a penalty. Firms that reduce emissions below allocated levels can sell their excess permits. Supply and demand will drive the market price of the permits. Firms without enough permits to cover their emissions will face financial penalties – thus creating an economic incentive to reduce emissions and to invest in emissions-cutting technologies.

Environmental agencies have experimented with three types of emissions trading market patterns since the early 1980s: cap and trade markets (allowance trading system), rate-based markets,

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<sup>1</sup> This paper was prepared by the INECE Secretariat and its Expert Working Group on Emissions Trading: Neil Davies, Environment Agency (England/Wales); Geert van Grootveld, VROM (The Netherlands); Nick Johnstone, OECD; Joe Kruger, Resources for the Future; Kenneth Markowitz, Earthpace and the INECE Secretariat; Brian McLean, USEPA; and Durwood Zaelke, Institute for Governance and Sustainable Development and Director of the INECE Secretariat.

<sup>2</sup> IPCC, Third Assessment Report - Climate Change 2001. Available online at <http://www.ipcc.ch/>.

<sup>3</sup> Pew Center Climate Change, Glossary. Available online at [http://www.pewclimate.org/global-warming-basics/full\\_glossary/terms\\_d.cfm](http://www.pewclimate.org/global-warming-basics/full_glossary/terms_d.cfm).

<sup>4</sup> European Parliament and Council Directive 2003/87/EC. Available online at <http://europa.eu.int/comm/environment/climat/emission.htm>.

<sup>5</sup> Title IV of the 1990 Clean Air Act Amendments, 42 U.S.C. 7651-7651o. Available online at <http://www.epa.gov/air/caa/title4.html>.

<sup>6</sup> Kyoto Protocol, Article 17. Available online at <http://unfccc.int/resource/docs/convkp/kpeng.pdf>.

and offset trading markets.<sup>7</sup> Cap and trade market systems have emerged as the most effective trading scheme in terms of both cost and amount of pollution reduction. Rate-based markets do not set a total overall cap on emissions, but set a rate standard for each source, which allows for the potential for emissions to increase if new sources are built.<sup>8</sup> Offset trading markets often have high administrative and transaction costs and require greater oversight than cap and trade market systems.<sup>9</sup>

## 2.1 Existing Cap and Trade Markets

Under a cap and trade market, an annual area-wide emissions cap is established for a defined region of air pollution sources, with a reduction schedule set over time. Shares of this cap are usually distributed to sources of emissions in the form of allowances. Allowances can be allocated in several different ways, but traditionally have been allotted to each participating source based on a performance standard (benchmark) and historic fuel use information. Each participating source must have enough allowances at the end of the annual compliance period to cover their total emissions for that period. The sources meet their allowed emissions amount by implementing emissions control measures, by buying emissions allowances in the trading market, or by a combination of these two approaches. Companies that are able to significantly decrease their emissions will benefit from this program by selling unused allowances on the market. Unused allowances can be banked for future use, traded, retired, or sold.

For example, the USEPA's Acid Rain Program (Title IV of the 1990 Clean Air Act Amendments)<sup>10</sup>—established to reduce emissions of sulfur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>)—uses a cap and trade policy system to control emissions.<sup>11</sup>

The Kyoto Protocol also uses the framework of a cap and trade system as one of the flexibility mechanisms designed to allow Parties with legally-binding obligations to meet their reduction targets. Under the Protocol's emissions trading provision, Annex I parties may trade their "assigned amount units" with other Annex I parties.<sup>12</sup> Further information about the US trading system, the Kyoto Protocol, and other programs is available in the Appendices to this paper.

## 2.2 The European Union Emissions Trading Scheme

One of the drivers of this Workshop is the newly-created EU ETS, which is scheduled to come into effect on 1 January 2005. The EU ETS is one of the policies being introduced across Europe to help the EU meet its commitment made in the Kyoto Protocol to reduce greenhouse gas<sup>13</sup> emissions to 8 percent of their 1990 levels by 2010.<sup>14</sup>

The EU ETS, which is also a cap and trade scheme, was established by the European Parliament and Council Directive 2003/87/EC, signed on 13 October 2003.<sup>15</sup> All EU Member States are required to set emissions caps for firms covered by the Directive and to allocate permits to these firms in National

<sup>7</sup> EPA, A Guide to Designing and Operating a Cap and Trade Program for Pollution Control, 2003. p. 2-7.

<sup>8</sup> EPA, A Guide to Designing and Operating a Cap and Trade Program for Pollution Control, 2003. p. 2-9.

<sup>9</sup> EPA, A Guide to Designing and Operating a Cap and Trade Program for Pollution Control, 2003. p. 2-8.

<sup>10</sup> A. Denny Ellerman *et al* note, "Title IV mandates that electric utility sources achieve a 50% reduction from their 1980 levels of acid-rain precursor emissions—both sulfur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>). The major part of the reduction, which concerns SO<sub>2</sub>, is to be achieved entirely by marketable emission permits. The initial limitation of SO<sub>2</sub> emissions took effect in 1995, when major generating units with relatively high emission levels were issued permits, or "allowances," requiring an intermediate aggregate reduction of emissions during a five-year 'Phase I' period. The full reduction will be implemented in Phase II: in the year 2000, all electricity-generating units will be issued allowances limiting SO<sub>2</sub> emissions nationally to about 9 million tons—roughly 50% of their 1980 emissions." See Ellerman *et al*, EMISSIONS TRADING UNDER THE US ACID RAIN PROGRAM, 1997.

<sup>11</sup> For more information on USEPA's Acid Rain SO<sub>2</sub> Trading Program, see the Agency's Web site at <http://www.epa.gov/airmarkets/>. In 2002, SO<sub>2</sub> emissions were 41% lower than 1980 levels and NO<sub>x</sub> emissions were 33% lower than 1990 emissions.

<sup>12</sup> Kyoto Protocol, Article 17. Available online at <http://unfccc.int/resource/docs/convkp/kpeng.pdf>.

<sup>13</sup> In the EU Directive, the term "greenhouse gases" refers to carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride.

<sup>14</sup> EU Member States ratified the Kyoto Protocol on 31 May 2002, and despite ratifications from 120 Parties representing two-thirds of the world's population, the Protocol will not enter into force until Russia or the United States ratifies. The Protocol commits the EU to reduce its greenhouse gas emissions by 8 percent of 1990 levels by 2012.

<sup>15</sup> Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emissions allowance trading within the Community and amending Council Directive 96/61/EC.

Allocation Plans (NAP). The NAPs must be produced by 31 March 2004. Firms that reduce emissions below allocated levels can then sell their excess permits.<sup>16</sup>

The first phase of the trading scheme will run through 2007 and affect approximately 12,000 installations in the EU across a range of industries, including: power generators, oil refineries, glass and cement manufacturers, steelworks, and paper mills.<sup>17</sup> The second phase will run from 2008-2012 to coincide with the first Kyoto Commitment Period.<sup>18</sup> The trading program may be expanded to cover other sectors (e.g., transportation, chemical manufacturers, aluminum industry) during this second period. The European Commission is due to report on expanding the trading scheme to these and other sectors by June 30, 2006.

### **3 ESTABLISHING SUCCESSFUL COMPLIANCE AND ENFORCEMENT PROGRAMS TO SUPPORT EMISSIONS TRADING**

Emissions trading programs must be supported by reliable enforcement mechanisms to ensure that the program targets are met. The INECE *Principles of Environmental Enforcement* outlines the following components of a successful enforcement programs.<sup>19</sup>

#### **3.1 Develop Enforceable Program Requirements**

The first step in fostering compliance is to ensure that the program requirements are enforceable, i.e., that laws provide the necessary authority for enforcement and that the requirements are clear and practical. Trading program developers may wish to consider whether the program has sufficient authority and capacity to equitably enforce sanctions. One of the challenges may be finding a balance between program costs and adequate enforcement actions (including on-site visits, data processing, etc.).

#### **3.2 Identify the Regulated Community**

By clearly defining the regulated community early in the process, policymakers can effectively set program priorities, develop the most efficient compliance strategy, and target enforcement actions and inspection resources.

Information that policymakers may wish to obtain includes: facility identifying information, geographic location, existing licenses and permits, quantity of emissions produced by the facility, and the facility's history of compliance.

#### **3.3 Promote Compliance within the Regulated Community**

Compliance promotion is any activity that encourages voluntary compliance with environmental requirements.<sup>20</sup> Promotion activities include: providing education through workshops, guidance documents, and other means; offering technical assistance to the regulated community; building public support; publicizing success stories; and strengthening environmental management (auditing) capability within the regulated community.<sup>21</sup>

#### **3.4 Monitor Compliance**

Compliance monitoring – collecting and analyzing information on the compliance status of the regulated community<sup>22</sup> – is a particularly important component of a successful emissions trading market. Monitoring is essential to detect violations, provide evidence to support enforcement actions, and to

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<sup>16</sup> Firms that do not have enough permits to cover their emissions will face a fine of 40 euro per ton in the first phase of the scheme and 100 euro per ton in 2008-2012.

<sup>17</sup> Annex I lists the categories of activities subject to the trading scheme, and Annex II lists the greenhouse gases, which are: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride.

<sup>18</sup> EU emissions credits are expected to transfer to any international schemes arising under the Protocol.

<sup>19</sup> Components of a successful compliance and enforcement program adapted from USEPA, *Principles of Environmental Enforcement*, 1992. The *Principles of Environmental Enforcement* were developed by the USEPA in consultation with the Netherlands' Ministry of Housing, Spatial Planning and the Environment; the Polish Ministry of Environmental Protection, National Resources, and Forestry; and the Katowice Ecology Department in Poland. The full text of the *Principles* is available on the INECE Web site at <http://inece.org/enforcementprinciples.html>.

<sup>20</sup> *Principles of Environmental Enforcement*, 1992. p. 5-1.

<sup>21</sup> *Principles of Environmental Enforcement*, 1992. pp. 5-1, 5-2.

<sup>22</sup> *Principles of Environmental Enforcement*, 1992. p. 6-1.

evaluate program progress.<sup>23</sup> Effective emissions trading systems must be supported by rigorous emissions measurement and verification. In addition, public access to transparent emissions data further facilitates compliance. For example, the US SO<sub>2</sub> Trading Programs rely heavily on information technologies to facilitate electronic reporting and auditing of emissions data. The program requires many sources to have continuous emissions monitors (CEMs), which must be tested regularly for accuracy. The CEMs measure emissions and record the quantities digitally. The data can then be entered into a quarterly report format and be submitted electronically to the USEPA. EPA conducts electronic audits on virtually 100% of the data, and may follow-up with on-site inspections to ensure compliance.<sup>24</sup> All emissions data is available to the public on the Internet.

### 3.5 Develop a Methodology to Respond to Violations

For any regulatory program to be effective, strong enforcement mechanisms must be in place to ensure compliance with the regulation.<sup>25</sup> For this approach to be effective, the enforcement agency must ensure that regulations are strictly enforced and that there is an immediate levying of sanctions to ensure deterrence.<sup>26</sup> Furthermore, the government must consistently apply the enforcement mechanisms to all facilities in non-compliance when conducting enforcement activities.

For example, the USEPA Acid Rain program levies fines against facilities in non-compliance with emissions reduction targets. Fines reached \$2849 per excess ton of SO<sub>2</sub> in 2002, and are adjusted each year for inflation.<sup>27</sup> The Marrakech Accords, which establish enforcement mechanisms for the Kyoto Protocol, uses non-financial sanctions, e.g., decreasing the amount of tonnage a party is allowed for the subsequent compliance period; temporarily banning the party from international emissions trading<sup>28</sup> as the consequence for non-compliance.

### 3.6 Evaluate Successfulness and Weakness of the Program

Developing a system to measure and manage the program's enforcement actions is critical to the program's success. Information about compliance assurance is necessary to measure and manage the effectiveness of a compliance and enforcement program. The development of meaningful and robust environmental compliance and enforcement indicators helps to meet these demands.

There is a significant body of knowledge and experience concerning environmental indicators – measurable pieces of information that inform about the status of an area's environmental health. Policy makers have used these indicators for years to assess and report environmental program performance. They have also been used to communicate information about the state of the environment to the public.<sup>29</sup> More recently, led by the efforts of INECE, environmental compliance and enforcement (ECE) indicators have been gaining prominence as distinct, but related, measures of program efficiency and effectiveness.<sup>30</sup> ECE indicators can serve as effective measures of compliance promotion, compliance monitoring, and non-compliance response.

ECE indicators aid enforcement practitioners by:

- Assisting in monitoring operations of their compliance and enforcement programs, to help ensure that personnel and resources are being used effectively.

<sup>23</sup> Principles of Environmental Enforcement, 1992. p. 6-1.

<sup>24</sup> See Sonja Peterson, Monitoring, Accounting and Enforcement in Emissions Trading Regimes. OECD, 2003. Available online at [www.oecd.org/dataoecd/11/56/2957646.pdf](http://www.oecd.org/dataoecd/11/56/2957646.pdf).

<sup>25</sup> See USEPA, Principles of Environmental Enforcement, 1992, p. 7-1.

<sup>26</sup> See: John K. Stranlund et al, Enforcing Emissions Trading Programs, Theory, Practice, And Performance, <http://www.rff.org/rff/News/Coverage/2003/April/Enforcing-Emissions-Trading-Programs-Theory-Practice-and-Performance.cfm>.

<sup>27</sup> USEPA Acid Rain Program, 2002 Progress Report. Available online at <http://www.epa.gov/airmarkets/cmprpt/arp02/2002report.pdf>

<sup>28</sup> Wang and Wiser, The Implementation and Compliance Regimes under the Climate Change Convention and its Kyoto Protocol

<sup>29</sup> For further information on ECE indicators, please visit the INECE Indicators Web Forum at <http://www.inece.org/forumsindicators.html>. Refer specifically to the Background paper and presentations of the INECE-OECD Workshop at <http://inece.org/indicators/workshop.html>.

<sup>30</sup> INECE-OECD, Background Paper to a Workshop on Environmental Compliance and Enforcement Indicators: Measuring What Matters, 3-4 November, 2003. Available online at <http://inece.org/IndBackPaper.pdf>.

INECE-Environment Agency (England And Wales) Workshop on  
Compliance and Enforcement for Emissions Trading Schemes  
16 -18 March 2004

- Enhancing program accountability by serving as a record of the number and type of enforcement operations.
- Helping to assess the performance of environmental compliance and enforcement programs. These indicators help program managers learn what is working and what is not working and determine what needs to be done differently to achieve desired results.<sup>31</sup>

By building capacity for ECE indicators early in the program development process, enforcement practitioners will ensure that a methodology is in place to capture the effectiveness of their compliance and enforcement activities.

#### **4 WORKSHOP STRUCTURE AND PURPOSE**

In response to the European Union's (EU) decision to cap greenhouse gas emissions and establish an emissions trading scheme, the Environment Agency (England and Wales) and the International Network on Environmental Compliance and Enforcement (INECE) are co-sponsoring this Workshop to discuss and debate enforcement and compliance issues associated with emissions trading schemes.

The Workshop will convene experts on the development of emissions trading schemes, as well as leaders in the field of environmental enforcement. Key speakers will include the Chairman and Chief Executive of the Environment Agency, government ministers, senior officials from the European Commission, high-level officials from environmental agencies, executives from the industrial sector, and representatives of civil society groups. All of the continents will be represented at the Workshop.

Workshop participants will be invited to participate in breakout sessions to discuss and debate issues including how to identify best practices for compliance and enforcement for trading schemes; organizational issues and institutional barriers to successful enforcement of emissions trading; and how regulatory authorities can work together to co-ordinate compliance and enforcement internationally.

The Workshop will provide an opportunity for key stakeholders to engage in significant learning and networking opportunities and will elucidate methods for INECE to provide assistance in the creation of necessary knowledge and other support for developing compliance and enforcement mechanisms to implement emissions trading programs.

#### **5 ABOUT INECE**

The International Network for Environmental Compliance and Enforcement (INECE) is a partnership that promotes compliance and enforcement of domestic and international environmental laws by raising awareness, building capacity, and creating networks for enforcement cooperation. Made up of leading practitioners from governmental agencies, international institutions, non-governmental organizations, and regional enforcement networks, INECE is a "network of networks." It is the only global network focused on environmental enforcement and compliance at the national, regional, and international levels. The Dutch and US environmental agencies, who founded INECE in 1989, remain key funders, with additional support from the United Nations Environment Programme (UNEP), Environment Canada, the Environment Agency (England and Wales), the World Bank, and the European Commission.

For more information about INECE and its activities, visit the INECE Web site at <http://inece.org>. Please contact Durwood Zaelke, Director of the INECE Secretariat, by phone at 1.202.338.1300 or by e-mail at [inece@inece.org](mailto:inece@inece.org) if you have any questions or would like to become more involved with INECE.

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<sup>31</sup> INECE-OECD, Background Paper to a Workshop on Environmental Compliance and Enforcement Indicators: Measuring What Matters, 3-4 November, 2003. Available online at <http://inece.org/IndBackPaper.pdf>.

## APPENDIX A: QUESTIONS TO CONSIDER PRIOR TO THE WORKSHOP

1. In your experience, what are the key elements of “best practices” for compliance and enforcement for trading schemes?

- Which schemes are you familiar with?
- What do you consider to be the crucial aspects of the scheme for ensuring that credible compliance measures are in place, e.g., approving monitoring proposals, use of verification?
- Which data and information systems do you have available to support the development of these enforcement mechanisms?
- Which enforcement measures are in place and which ones have proven to be most successful?
- Which criteria could be developed for assessing the success of the compliance and enforcement regime (success criteria)?

2. What are the challenges to implementing an enforcement program to support emissions trading?

- What are the significant challenges to overcome when applying traditional enforcement measures within the context of an emission trading system?
- What are the potential hurdles to compliance and enforcement officials if trading schemes are added on to an existing regulatory program?

3. How do regulatory authorities work together to co-ordinate compliance and enforcement internationally?

4. What are necessary institutional arrangements for compliance and enforcement (for example, who should do what)?

- Which organizations are best suited to perform each of the following compliance and enforcement activities?
- What are the implications of using third party verification of emissions data?
- What might be the resource, legal, and political implications of centralizing versus decentralizing these functions?
  - For an allowance-based system: Allocation and tracking of allowances and allowance transfers
  - For a project-based system: Determination (or certification) of baselines, verification of credits created, and tracking of credit transfers
  - Processing and administration of emissions data submissions
  - Reconciliation of end-of-year (or end-of-period) emissions with allowances and/or credits
  - Quality assurance and auditing of emissions data
  - Providing compliance communications, outreach, training, and guidance to reporting sources, enforcement entities, and other relevant parties
  - Determining and issuing penalties (financial or surrendering of allowances/credits)
  - Collecting penalties
  - Taking severe enforcement actions

## **APPENDIX B: UK EMISSIONS TRADING SCHEMES (UK ETS)**

### **1 BACKGROUND**

The UK Emissions Trading Scheme, launched in April 2002, is the world's first economy-wide national-level greenhouse gas trading scheme. Emissions trading is designed to allow businesses to reduce their emissions of greenhouse gases in the most economically efficient way. The UK's ground-breaking scheme is designed to give Government, UK business and the City of London early experience of emissions trading and a first-mover advantage. The UK's national climate change target is a 20 percent reduction in carbon dioxide below 1990 levels by 2010.

The UK emissions trading scheme operates on a voluntary basis, and is open to all organizations operating in the UK. The trading scheme is not just an isolated policy instrument - it is be used to complement and to inject flexibility into other related policy instruments. For example, energy-intensive companies that have entered into Climate Change Agreements in order to receive an 80% discount from the Climate Change Levy will also be able to trade to meet emissions targets.

### **2 PENALTIES FOR NONCOMPLIANCE**

The main risk for a firm participating in the scheme is failing to meet its emissions reduction targets. If, at the end of an annual compliance period, a firm has not met its target by reducing its emissions or by buying allowances from other firms, there is a three-month reconciliation period. In this period, firms must have their emission levels independently verified. They can also buy sufficient allowances to meet their target and qualify for their incentive payment.

At the end of the reconciliation period, firms that still have not met their target will be subject to the following compliance penalties: (1) the financial incentive will not be paid and (2) the number of allowances allocated for the next year will be reduced by the shortfall plus a penalty factor of 1.3 tons.

Failure to meet the full five-year emissions reduction target will require the repayment with interest of any incentive monies received for meeting earlier annual targets. In addition, the Government intends to publish a list of those firms failing to meet their annual targets.

The scheme is expected to have statutory backing, including financial penalties. The Government is proposing that, for each commitment year, the penalty will be 20 per ton of CO<sub>2</sub> or twice the mean average market price of an allowance during the reconciliation period, whichever is the higher. The Government believes that this penalty will be effective, whilst not excessively high. It will not be applied retrospectively. When statutory penalties are in force, the penalty factor of 1.3 tons mentioned above will be removed.

In January 2004, the British Government became the first to develop its National Allocation Plan, a requirement under the new EU scheme designed to used market-based mechanisms to reduce GHGs. While the UK is the first country to release its plan, all 15 EU member countries must do so by 31 March, while the 10 eastern European countries soon to join the EU have a deadline of 1 May. The EU-wide program goes into effect on 1 January 2005.

### **3 UK IMPLEMENTATION OF THE EU EMISSIONS TRADING SCHEME (EU ETS)**

The Greenhouse Gas Emissions Trading Scheme Regulations came into force in the UK on 31<sup>st</sup> December 2003. In just under one year's time on January 1<sup>st</sup> 2005 approximately 1300 installations in the UK, and 12,000 – 20,000 installations across Europe will have to operate within constraints imposed on their carbon dioxide emissions as part of the 1<sup>st</sup> phase of the EU wide greenhouse gas emissions trading scheme (EU ETS). The EU ETS is one of the policy instruments that the Department for Environment, Food, and Rural Affairs (Defra) expects to deliver some of the reductions in greenhouse gas emissions it committed itself to in the 2003 Energy White Paper. The Energy White Paper reflects the UK's legally binding commitments under the Kyoto Protocol to reduce greenhouse gas emissions by 12.5% from 1990 levels by 2008-12, and the UK's domestic goal under the 2000 UK Climate Change Programme to reduce emissions of carbon dioxide by 20% from 1990 levels by 2010.

#### **3.1 How will the Scheme Operate**

The National Allocation Plan (NAP): By 31<sup>st</sup> March 2004 Defra has to decide on the quantity of carbon dioxide (the Cap) that will be allowed to be emitted by installations covered by the Directive, and critically, how the overall Cap on emissions will be divided up. This will constitute the UK's National

Allocation Plan (NAP). Defra's consultation document on the draft NAP published on 19<sup>th</sup> January 2004 proposes a provisional level of allowances for each installation within the scheme for the first phase. Total emissions of CO<sub>2</sub> in 2010 has been set at 506.9 MtCO<sub>2</sub>; equivalent to an overall reduction of 16.3% on 1990 levels.

The allocations included in this Plan will be only be finalised after the Commission has approved it. The final decision on allocations will be taken by September 30<sup>th</sup> 2004. In order to receive an allocation from the NAP an "existing" installation must hold a valid permit by 31<sup>st</sup> March 2004. "Existing" installations are those that were operational before 31 December 2003. Installations that become operational after this date will be eligible for a free allocation from the "New Entrant" reserve; this will comprise 5.7% of the total allowances available in Phase One.

### 3.2 Who Is Involved

It is mandatory for installations that fall within the remit of the Directive to hold a permit and an allocation of carbon dioxide by 1<sup>st</sup> January 2005 to operate. Installations included within the scheme are defined by activity type and input or capacity thresholds and include:

- Energy activities (with a rated thermal input exceeding 20 MW);
- The production and processing of ferrous metals;
- The production of cement clinker or lime;
- The manufacture of glass and glass fibre;
- The manufacture of ceramic bricks;
- The production of pulp from timber or other fibrous materials; and
- The manufacture of paper and board.

### 3.3 Monitoring and Verification

In order for the EU ETS to have the requisite level of integrity Operators of installations will have to monitor and report on their annual emissions. The verification of this monitoring report must be undertaken by a competent third-party verifier. The monitoring and reporting process for an installation must include all emissions of carbon dioxide from all sources belonging to activities listed in Annex I to the Directive. The Directive also requires that greenhouse gas emissions permits shall contain a condition requiring Operators to specify their monitoring methodology.

### 3.4 Monitoring Standards

The EU Monitoring and Reporting guidelines, were adopted in February 2004. The guidelines currently provide for a choice between measurement and calculation of emissions as well as setting out a range of "tiered" methodologies for each industry sector within the Regulations. The default position from the Commission's point of view is that Operators should use the highest (and most accurate) tier unless "it is shown to the satisfaction of the competent authority that the highest tier approach is technically not feasible or will lead to unreasonably high costs...". There is limited provision within the guidelines to apply less stringent or "de minimis" standards to minor sources within sites that contribute to less than 5% of total emissions from that site.

The guidelines also confirm that biomass fuels will be zero-rated, and includes a list that identifies fuels that are carbon neutral for the purposes of the scheme. These include:

- Wood wastes
- Sewage sludge
- Bio-fuels
- Landfill gas
- Biomass fractions of paper, cardboard, municipal waste, and cardboard waste.

The Operator must submit a verified report for the preceding calendar year to the relevant Regulator by 31<sup>st</sup> March each year. By April 30<sup>th</sup> of each year, each Operator will have had the opportunity to buy, sell, or bank allowances, and must have surrendered a number of allowances from their account equal to their annual verified emissions for the time period in question. The first time this must happen will be by 30<sup>th</sup> April 2006.

INECE-Environment Agency (England And Wales) Workshop on  
Compliance and Enforcement for Emissions Trading Schemes  
16 -18 March 2004

3.5 Enforcement: Penalties and Opportunities

The Regulations provide for a number of offences including failure to hold a valid permit whilst operating, failing to comply with monitoring and reporting conditions, and failing to have surrendered sufficient allowances following the annual monitoring and verification rounds.

3.6 Penalties

During the first phase of the scheme from 1st January 2005 – 31st December 2007 failure to have surrendered enough allowances will result in a fine of 40 Euros for each tonne by which reported emissions exceed allowances held. For example, a medium sized company with annual carbon dioxide emissions of 100,000 tonnes equivalent (te) that is allocated allowances of 90,000te could be liable for a fine of 400,000 Euros if it does not retire sufficient allowances, either by reducing its emissions or purchasing more allowances.

3.7 Opportunities

Conversely, companies that are in a position to reduce their emissions cost-effectively will be in a position to trade, and with the current price of a tonne of carbon at around 12.5 Euros in the futures market a company with 10,000 allowances to trade could expect to receive an income of 125,000 Euros from their sale.

Web sites:

- Defra Emissions Trading Website:  
<http://www.defra.gov.uk/environment/climatechange/trading/index.htm>
- Defra Guidance on Emissions Trading Policy Issues:  
<http://www.defra.gov.uk/environment/climatechange/trading/eu/index.htm>
- Further information and guidance for Operators on the EU:  
<http://environment-agency.gov.uk/emissionstrading>
- UK National Allocation Plan (NAP):  
<http://www.defra.gov.uk/environment/climatechange/trading/eu/nap.htm>

## **APPENDIX C: USEPA CLEAN AIR MARKETS PROGRAM**

### **1 BACKGROUND**

The USEPA Clean Air Markets Program is comprised of various market-based regulatory programs designed to improve air quality. The most well-known of these programs is USEPA's Acid Rain Program, which has the overall goal of achieving environmental and public health benefits through reductions in emissions of sulfur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>)—compounds produced by fossil fuel combustion that adversely affect air quality, the environment, and public health.

### **2 THE US ACID RAIN PROGRAM**

The overall goal of the Acid Rain Program is to achieve significant environmental and public health benefits through reductions in emissions of SO<sub>2</sub> and NO<sub>x</sub>, the primary causes of acid rain. To achieve this goal at the lowest cost to society, the program employs both traditional and innovative, market-based approaches for controlling air pollution. In addition, the program encourages energy efficiency and pollution prevention.

The Acid Rain Program allows sources to select their own compliance strategy. For example, to reduce SO<sub>2</sub>, an affected source may repower its units, use cleaner burning fuel, or reassign some of its energy production capacity from dirtier units to cleaner ones. Sources also may decide to reduce electricity generation by adopting conservation or efficiency measures. Most options, like fuel switching, require no special prior approval, allowing the source to respond quickly to market conditions without needing government approval. For NO<sub>x</sub>, the source may meet the performance standard on a utility-unit basis, enter into an emissions averaging plan, or apply for an alternative emissions limitation. In either case, the program allows affected utilities to combine these and other options in ways they see fit in order to tailor their compliance plans to the unique needs of each unit or system.

The Acid Rain Program's compliance and enforcement provisions give it environmental integrity and provide the incentive for an effective trading program. These provisions include (1) accurate and complete monitoring, reporting, and verification of emissions data; (2) tracking of tradable allowances with an electronic registry, (3) automatic financial penalties for excess emissions and a requirement to offset these emissions; (4) a credible threat of enforcement action if requirements of the compliance regime are violated; and (5) public access to emissions and trading data. The program makes extensive use of information technologies in carrying out many of the activities related to monitoring and compliance.

### **3 NEW PUBLICATION**

#### **3.1 Tools of the Trade: A Guide to Designing and Operating a Cap and Trade Program for Pollution Control**

This Guidebook is intended as a reference for policymakers and regulator considering cap and trade as a policy tool to control pollution. It is intended to be sufficiently generic to apply to various pollutants and environmental concerns; however, it emphasizes cap and trade to control emissions produced from stationary source combustion. In the United States, SO<sub>2</sub> and NO<sub>x</sub> are controlled with cap and trade programs. The guidebook is available at <http://www.epa.gov/airmarkets/international/tools.pdf>.

*Excerpted from the USEPA Air Markets Website*

#### **Websites:**

- USEPA Air Markets Program Website: <http://www.epa.gov/airmarkets/>
- USEPA Acid Rain Program Progress Report:  
<http://www.epa.gov/airmarkets/cmprpt/arp01/2001report.pdf>
- USEPA Introductory Materials on Cap and Trade Programs:  
<http://www.epa.gov/airmarkets/trading/>

## APPENDIX D: THE KYOTO PROTOCOL AND THE MARRAKECH ACCORDS

**The Kyoto Protocol to the United Nations Framework Convention on Climate Change will strengthen the international response to climate change.** Adopted by consensus at the third session of the Conference of the Parties (COP-3) in December 1997, it contains legally binding emissions targets for Annex I (industrialized) countries. By arresting and reversing the upward trend in greenhouse gas emissions that started in these countries 150 years ago, the Protocol promises to move the international community one step closer to achieving the Convention's ultimate objective of preventing anthropogenic interference with the climate system.

**The developed countries are to reduce their collective emissions of six key greenhouse gases by at least 5%.** This group target will be achieved through cuts of 8% by Switzerland, most Central and East European states, and the European Union (the EU will meet its group target by distributing different rates among its member states); 7% by the US; and 6% by Canada. Hungary, Japan, and Poland. Russia, New Zealand, and Ukraine are to stabilize their emissions, while Norway may increase emissions by up to 1%, Australia by up to 8%, and Iceland 10%. The six gases are to be combined in a basket, with reductions in individual gases translated into CO<sub>2</sub> equivalents that are then added up to produce a single figure. Each country's emissions target must be achieved by the period 2008-2012.



**Countries will have some flexibility in how they make and measure their emissions reductions.**

In particular, an international emissions trading regime (cap and trade system) will be established allowing industrialized countries to buy and sell emissions credits amongst themselves. They will also be able to acquire emission reduction units by financing certain kinds of projects in other developed countries. In addition, a clean development mechanism for promoting sustainable development will enable industrialized countries to finance emissions-reduction projects in developing countries and to receive credit for doing so. The use of these three mechanisms is to be supplemental to domestic action.

Under the COP7 in Marrakesh, the Parties to the Kyoto Protocol agreed to establish enforcement mechanisms, and thus created two bodies responsible for implementing these mechanisms when Parties are not in compliance with their commitments: a Facilitative Branch and an Enforcement Branch. The Enforcement Branch has the power to apply sanctions to Parties not meeting their commitments.

Compliance Mechanisms include:

- Reporting: Article 12 of the UNFCCC requires that parties report their GHG Inventories on an annual basis
- If an Annex 1 party fails to meet its reduction target, it will face the following consequences:
  - For every ton of emissions exceeded, the party will lose 1.3 tons from its allowance for the subsequent compliance period
  - The party must submit a plan for meeting the target
  - The party may be banned from international emissions trading until it has proven that it can meet the targets.

*Excerpted from the UNFCC Climate Change Information Kit*

Websites:

- The UN Framework Convention on Climate Change Website: <http://unfccc.int/index.html>
- UNFCCC Climate Change Information Kit: [http://unfccc.int/resource/iuckit/infokit\\_02\\_en.pdf](http://unfccc.int/resource/iuckit/infokit_02_en.pdf)
- The Kyoto Protocol Full Text: <http://unfccc.int/resource/docs/convkp/kpeng.pdf>
- The Marrakech Accords Full Text: [http://unfccc.int/cop7/documents/accords\\_draft.pdf](http://unfccc.int/cop7/documents/accords_draft.pdf)

## **APPENDIX E: THE USE OF TRADABLE PERMITS IN COMBINATION WITH OTHER ENVIRONMENTAL POLICY INSTRUMENTS**

The OECD Environment Directorate (and others) have frequently made reference to the environmental effectiveness and economic efficiency of using a mix of environmental policy instruments, rather than one single instrument, when seeking to address environmental concerns. However, very little work has been done on the conditions under which the use of multiple environmental policy instruments is likely to be preferable to the application of a single policy instrument. Moreover, little work has been done on examining the combinations of policy instruments which are likely to serve as effective and efficient complements. As such it is instructive to explore the conditions under which it is likely to be effective and efficient to use two instruments to hit one target.

A new work programme at the OECD Environment Directorate is exploring these issues. As an initial contribution toward this work, this report reviews the links between tradable permits and other instruments. The report concentrates on cases in which tradable permits are used as part of a policy mix to address negative environmental impacts associated with pollution emissions. It assesses the implications associated with the use of tradable permits in conjunction with environmentally-related taxes, subsidies, voluntary agreements, direct regulation, and other tradable permit systems.

The report finds that in many cases the use of a mix of policies will be at best redundant and at worst counter-productive. If a particular instrument is an economically efficient and environmentally effective means of meeting a given environmental objective, there is little sense in introducing an additional instrument. However, if it is not possible to introduce a 'first-best' instrument then a strong case can be made for the use of multiple environmental policy instruments. In particular, the report highlights the benefits of using tradable permits as part of a policy mix in the following four areas:

- *Dealing with spatial differentiation of impacts.* Work on tradable permits has revealed that it is important for the smooth and efficient functioning of the market that the permit market be very broad and deep. However, for pollutants whose impacts vary by place of emission, this implies that the permit price will only be incidentally associated with marginal damages for most emitters. There is, therefore, a trade-off between efficiency in the market for permits and the equalization of marginal abatement costs with marginal environmental damages. In order to mediate this trade-off it may be preferable to use direct regulations as constraints on trading, rather than complicating the permit regime itself.
- *Addressing technology market barriers and failures.* Most tradable permit regimes target emissions (or a close proxy). Under perfect market conditions, such a regime should "call forth" the optimal rate and direction of technological change to reduce these impacts. However, if there are significant market failures which adversely affect the development of technologies for abatement, then it may be necessary to introduce complementary policies to overcome such failures if the environmental damages are to be reduced at least costs.
- *Expanding regulatory scope and reach.* The flexibility of tradable permit regimes allows them to play an important role in expanding the scope of the regulatory authority's reach, particularly when used in conjunction with other instruments. For instance, effective combinations can be devised to allow for voluntary adherence to tradable permit systems or to encourage regulated firms to improve environmental performance in unregulated firms. Using tradable permits can be a lower-cost option than extending regulatory reach by expanding the scope of direct regulations to areas which are difficult to reach.
- *Reducing compliance cost uncertainty.* Tradable permits have the singular advantage of environmental effectiveness. Unlike any other instrument - including direct regulations - the achievement of a particular environmental objective (if expressed in terms of emissions) can be achieved with certainty. However, they have uncertain cost implications. Using taxes as a cap on permit prices and subsidies as a floor, can reduce this uncertainty. By reducing risk, this can have benefits for both affected firms and for the regulatory authority.

INECE-Environment Agency (England And Wales) Workshop on  
Compliance and Enforcement for Emissions Trading Schemes  
16 -18 March 2004

However, in all cases the objective of each instrument must be clearly defined, and the relationship between the two instruments must be properly understood. As noted above, if the objectives are the same and one or the other instrument is 'first-best', the additional instrument will be at best redundant but more administratively costly, and at worst the combination will be economically inefficient and environmentally ineffective. Thus in order for the use of an additional policy instrument to increase efficiency and effectiveness in the presence of a tradable permit system, the "complementary" instrument must:

- Meet a legitimate policy objective which can not be met directly through the tradable permit system;
- Be the best instrument available to the regulatory authority if it is to meet that policy objective;
- Be administratively feasible and be introduced at reasonable cost by the public authorities; and,
- Be an effective complement to the tradable permit system.

The difficulties involved in satisfying all of these conditions is a reflection of the difficulties involved in putting in place an effective and efficient policy mix.

Excerpted from *The Use of Tradable Permits in Combination with Other Environmental Policy Instruments*, written by OECD by Nick Johnstone

Websites and other resources:

- Full text of *The Use of Tradable Permits in Combination with Other Environmental Policy Instruments*: <http://www.oecd.org/dataoecd/11/55/2957650.pdf>
- Proceedings from OECD Global Forum on Sustainable Development: Emissions Trading (held in Paris, March 2003): [http://www.oecd.org/document/38/0,2340,en\\_2649\\_34361\\_2507110\\_119681\\_1\\_1\\_1,00.html](http://www.oecd.org/document/38/0,2340,en_2649_34361_2507110_119681_1_1_1,00.html)
- Bibliography of Emissions Trading Publications: [http://www.colby.edu/personal/t/thtieten/tradable\\_permits\\_air.htm](http://www.colby.edu/personal/t/thtieten/tradable_permits_air.htm)
- Costanza, Cumberland, Daly, Goodland and Norgaard, *An Introduction to Ecological Economics, A Transdisciplinary Pollution Control Policy Instrument*, pp.217-221 (1997).

## APPENDIX F: ADDITIONAL ONLINE RESOURCES

### Environment Agency

The leading public body responsible for protecting and improving the environment in England and Wales.  
<http://www.environment-agency.gov.uk/>

- Implementation of the EC GHG Emissions Trading Scheme: <http://www.environment-agency.gov.uk/business/444217/590750/590838/556574/>

### European Commission: Emissions Trading Resources

<http://europa.eu.int/comm/environment/climat/emission.htm>

- Green Paper on greenhouse gas emissions trading within the European Union:  
[http://europa.eu.int/comm/environment/docum/0087\\_en.htm](http://europa.eu.int/comm/environment/docum/0087_en.htm)

### European Pollutant Emission Register (EPER)

EPER gives users access to information on the annual emissions of 9,256 industrial facilities in the 15 Member States of the EU as well as Norway – mostly from the year 2001.

<http://www.eper.cec.eu.int/eper/>

### The International Network for Environmental Compliance and Enforcement (INECE)

The International Network for Environmental Compliance and Enforcement (INECE) is a partnership of government and non-government enforcement and compliance practitioners from over 100 countries. INECE's goals are: raising awareness to compliance and enforcement; developing networks for enforcement cooperation; and strengthening capacity to implement and enforce environmental requirements. <http://www.inece.org>

- Principles of Environmental Enforcement: <http://inece.org/enforcementprinciples.html>
- INECE's Europe Regional Network: [http://inece.org/region\\_europe.html](http://inece.org/region_europe.html)

### European Environment Agency (EEA)

The EEA aims to support sustainable development and to help achieve significant and measurable improvement in Europe's environment through the provision of timely, targeted, relevant and reliable information to policy-making agents and the public.

- Emission Inventory Guidebook (2003): <http://reports.eea.eu.int/EMEPCORINAIR4/en>
- Annual European Community greenhouse gas inventory 1990-2001 and inventory report 2003: [http://reports.eea.eu.int/technical\\_report\\_2003\\_95/index\\_html](http://reports.eea.eu.int/technical_report_2003_95/index_html)
- Greenhouse gas emission trends and projections in Europe:  
[http://reports.eea.eu.int/environmental\\_issue\\_report\\_2003\\_36/index\\_html](http://reports.eea.eu.int/environmental_issue_report_2003_36/index_html)

### Pew Center for Research on Global Climate Change

The Pew Center on Global Climate Change brings together business leaders, policy makers, scientists, and other experts to bring a new approach to a complex and often controversial issue. Our approach is based on sound science, straight talk, and a belief that we can work together to protect the climate while sustaining economic growth. <http://www.pewclimate.org/>

- Emissions Trading in the U.S.: Experience, Lessons, and Considerations for Greenhouse Gases: [http://www.pewclimate.org/global-warming-in-depth/all\\_reports/emissions\\_trading/index.cfm](http://www.pewclimate.org/global-warming-in-depth/all_reports/emissions_trading/index.cfm)
- Designing a Mandatory Greenhouse Gas Reduction Program for the U.S.:  
[http://www.pewclimate.org/global-warming-in-depth/all\\_reports/mandatory\\_ghg\\_reduction\\_prgrm/index.cfm](http://www.pewclimate.org/global-warming-in-depth/all_reports/mandatory_ghg_reduction_prgrm/index.cfm)
- Promoting Meaningful Compliance with Climate Change Commitments:  
[http://www.pewclimate.org/global-warming-in-depth/all\\_reports/promoting\\_compliance/index.cfm](http://www.pewclimate.org/global-warming-in-depth/all_reports/promoting_compliance/index.cfm)