



COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 8.3.2000  
COM(2000) 87 final

**Green Paper**

**on greenhouse gas emissions trading within the European Union**

**(presented by the Commission)**

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## POLICY SUMMARY

This Green Paper is intended to launch a discussion on greenhouse gas emissions trading within the European Union, and on the relationship between emissions trading and other policies and measures to address climate change.

Under the Kyoto Protocol, the European Community committed itself to reducing its emissions of greenhouse gases by 8% during the period 2008-2012 in comparison with their levels in 1990. In practice, this will require an estimated reduction of 14% compared to “business as usual” forecasts<sup>1</sup>. Emissions trading, both internally within the Community and externally with other industrialised countries, will help reduce the cost to the Community of respecting its commitments. Together with other policies and measures, emissions trading will be an integral and major part of the Community’s implementation strategy. It is the Commission’s belief that the Community as a whole will need to use all the tools at its disposal to respect its international commitments, and the sooner concrete steps are taken the better. The EU is currently preparing for ratification of the Kyoto Protocol, which it wishes to see enter into force by 2002.

Emissions trading, whether domestic or international, is a scheme whereby entities such as companies are allocated allowances for their emissions. Companies that reduce their emissions by more than their allocated allowance can sell their “surplus” to others who are not able to reach their target so easily. This trading does not undermine the environmental objective, since the overall amount of allowances is fixed. Rather, it enables cost-effective implementation of the overall target and provides incentives to invest in environmentally sound technologies.

As emissions trading is a new instrument for environmental protection within the EU, it is important to gain experience in its implementation before the international emissions trading scheme starts in 2008. There is a good case for the European Community and its Member States to prepare themselves by commencing an emission trading scheme within the Community by 2005.

The Commission believes that a coherent and co-ordinated framework for implementing emissions trading covering all Member States would provide the best guarantee for a smooth functioning internal emissions market as compared to a set of unco-ordinated national emissions trading schemes. A Community emissions trading scheme would lead to one single price for allowances traded by companies within the scheme, while different unconnected national schemes would result in different prices within each national scheme. The development of the internal market has been one of the driving forces behind the EU’s recent development, and this should be taken into consideration when creating new markets. Climate change is the clearest case of transboundary effects requiring concerted action. Moreover, scale effects at the level of the EU will allow for significant cost-savings, while similar regulatory arrangements will allow to keep administrative costs as low as possible.

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<sup>1</sup> For more details see Section 2 of COM(1999)230 dated 19.05.1999: Communication from the Commission to the Council and the European Parliament “Preparing for Implementation of the Kyoto Protocol”.

The key policy options to be decided upon in establishing such a framework are essentially: which countries and which companies in which sectors will participate? How, and by whom, should the allocation of allowances be made to the sectors and companies involved in emissions trading compared to those not involved, and to individual companies participating in emissions trading? How can emissions trading build upon existing policies and measures such as technical regulation, environmental agreements and fiscal incentives, and how can equivalence of effort be ensured between companies involved in emissions trading and those subject to other policies and measures?

The Commission believes that a Community approach is necessary to ensure competition is not distorted within the internal market. Different national emissions trading systems could raise serious difficulties concerning state aid and new companies entering into the market. This situation would raise uncertainty both for Member States and firms. Moreover, those problems are likely to worsen further in the context of the enlargement of the Community.

The strength and environmental integrity of any emissions trading regime will largely depend upon its compliance provisions and a robust enforcement regime. An effective functioning of such a regime requires a certain degree of harmonisation of the rules of monitoring, reporting and verification.

This Green Paper constitutes the start of a process of exploring these issues. Succinct reactions and opinions are requested, focussed on the questions contained in this document. These are invited to be made by 15 September 2000 so that the Community's implementation strategy can be developed in the light of these opinions immediately after the Sixth Conference of the Parties that will take place in The Hague, the Netherlands, from 13 to 24 November 2000. Submissions should be sent to Mr J. DELBEKE, Head of the Climate Change Unit, European Commission (DG ENV), 200 rue de la Loi/Wetstraat 200, B-1049 Bruxelles/Brussel, Belgium. They may alternatively be sent by e-mail to the following address: "[ENV-CLIMATE@cec.eu.int](mailto:ENV-CLIMATE@cec.eu.int)".

## 1. INTRODUCTION

The Kyoto Protocol was adopted in December 1997 by the 3<sup>rd</sup> Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC). The Protocol was significant because it sets limits on the greenhouse gas emissions of industrialised countries. Under the Protocol, the European Community committed itself to reducing its emissions of six greenhouse gases by 8% during the period 2008 to 2012 in comparison with their levels in 1990<sup>2</sup>.

The Protocol also introduced 3 new international mechanisms, referred to as the “flexible mechanisms” or “Kyoto mechanisms”, that are essential components of the Protocol as a whole, and without which the Protocol is unlikely to enter into force. These mechanisms are intended to facilitate the cost-effective implementation of the Protocol. One of these mechanisms is the international trading of greenhouse gas emissions (“emissions trading”) <sup>3</sup>, that would become operational from the year 2008<sup>4</sup>.

The European Community is a full Party to the UNFCCC and a signatory of the Kyoto Protocol, and is one of the 39 Parties<sup>5</sup> that have accepted a quantitative absolute limit on emissions and may therefore participate in international emissions trading under the Protocol.

In May 1999, the Commission adopted a Communication on climate change<sup>6</sup> that highlighted the need for a “sustained policy response”. The Communication states that observed data show that carbon dioxide emissions are increasing, and that “Unchecked, this trend means that the requirement of Article 3(2) of the Kyoto Protocol to show “demonstrable progress” by 2005 and the EU commitment of –8% will not be met”.

A major challenge is to ensure that emissions trading complements and is compatible with other policies and measures. In the international negotiations, the EU insists on the need for the industrialised world to put in place domestic policies and measures as the main means of action. Within the EU many such measures, such as energy taxes, regulatory or technical standards and environmental agreements are already in place. Any Community emissions trading should reinforce, and certainly not weaken, these existing foundations.

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<sup>2</sup> The reduction of 8% should also take account of “sinks”. “Sinks” are things such as forests, which absorb carbon dioxide from the atmosphere. Ultimately, of course, trees die and decompose, releasing greenhouse gases back into the atmosphere. Alternatively, wood may be used as a fuel, releasing carbon dioxide back into the atmosphere. Both because of their “temporary” nature, and due to the considerable methodological uncertainties in measuring rates of absorption and emissions, much further work on “sinks” is warranted.

<sup>3</sup> Article 17 of the Kyoto Protocol.

<sup>4</sup> The other two mechanisms are joint implementation and the Clean Development Mechanism, that both involve the transfer of emission reduction credits earned on the basis of emission abatement projects in other countries.

<sup>5</sup> These Parties are listed in Annex B of the Kyoto Protocol.

<sup>6</sup> COM(1999)230 final dated 19.05.1999 “Preparing for Implementation of the Kyoto Protocol”.

Possible negative effects on international competitiveness will be minimised if, as is expected, other industrialised countries become involved in greenhouse gas emissions trading under the Kyoto Protocol. When an international trading scheme comes into being, as of 2008, companies are likely to face similar costs whichever industrialised country they are located in.

## **2. GREEN PAPER FOR WIDE STAKEHOLDER CONSULTATION**

This Green Paper is the start of a consultation process which will allow all stakeholders, both governmental and non-governmental, to give their opinions on how the EU should strike the right balance in the use of emissions trading.

The Kyoto Protocol has put emissions trading on the EU agenda. This is a new instrument for European climate change policy. Emissions trading, both within the EU and between the EU and the rest of the industrialised world, will become an important element of the Community's implementation strategy for the Kyoto Protocol.

Member States and the Community need to prepare their strategies for implementing the Kyoto Protocol, and reflect further on how emissions trading fits into their climate strategies. In this context, a debate should be started on the European Community dimension in emissions trading, including the potential impact on the internal market. In particular the involvement of companies will inevitably raise issues related to state aid and fair competition in respect of which the Community unquestionably has a role to play. It should also be ensured that Member State initiatives do not also create undue barriers to the freedom of establishment within the internal market<sup>7</sup>.

Consultation on the basis of this Green Paper, even if focussed on starting emissions trading within the European Union before the year 2008, may provide valuable insights that can be fed into the United Nations negotiating process. Better understanding of the key issues and interactions with domestic policies and measures will help ensure realistic expectations for decisions on emissions trading at the 6<sup>th</sup> Conference of the Parties to the Framework Convention on Climate Change (COP6), which will take place in The Hague from 13 to 24 November 2000.

## **3. WHAT IS EMISSIONS TRADING?**

Emissions trading is a scheme whereby companies are allocated allowances for their emissions of greenhouse gases according to the overall environmental ambitions of their government, which they can trade subsequently with each other.

These emission allowances are sometimes called "quotas", "permits" or "caps". The total of all these allowances allocated to all the companies included in the scheme

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<sup>7</sup> The objective of the principle of freedom of establishment, under Article 43 and 48 of the EC Treaty (old Articles 52 and 58), is to confer on companies or firms formed in accordance with the law of a Member State, the right to set up their principle establishment in another Member State or to create agencies, branches or subsidiaries in other Member States. Benefit of this freedom is contingent upon observance of the rules applying to companies or firms already established, provided they do not contain any unjustified discriminatory measures.

represents the overall limit on emissions allowed by the scheme. *It is this overall limit that provides the environmental benefit of the scheme.* One main attraction of emissions trading is that it provides certainty of environmental outcome.

The concept of “permits” is well established in environment policy, particularly for the application of technical standards in the field of waste, water and air pollution. Such regulation includes the Integrated Pollution Prevention and Control (IPPC) Directive<sup>8</sup>. However, regulatory instruments cannot ensure a pre-determined environmental outcome, as the number of new plants – and so total emissions – can be greater than foreseen, even if they all use the best technical standards.

Emissions trading allows individual companies to emit more than their allowance on condition that they can find another company that has emitted less than allowed and is willing to transfer its “spare” allowances. The overall environmental outcome is the same as if both companies used their allowances exactly, but with the important difference that both buying and selling companies benefited from the flexibility offered by trading, without disadvantage to the environment. Both companies involved incur lower compliance costs than they would have been able to do without the possibility of trading (the “selling-company” receiving payment for the allowances transferred, and the “buying-company” incurring less costs than would have been implied by adhering to the pre-determined emissions allowance). A transparent price signal would also enable other companies to better judge the business opportunities of trading, and their potential benefit in engaging in this market. Furthermore, as emissions trading will induce competition between companies to find cost-effective ways to reduce their emissions, an additional boost will be given to environmentally friendly technologies.

The key economic rationale behind emissions trading is to use market mechanisms to ensure that emissions reductions required to achieve a pre-determined environmental outcome take place where the cost of reduction is the lowest.

Although there are no major applications of tradable allowances under EU environmental policy, the concept of tradable allowances is not totally unfamiliar in the European Community. The quotas for Ozone Depleting Substances under the Montreal Protocol<sup>9</sup>, the fish catch quotas under the Common Fisheries Policy<sup>10</sup>, and the milk quotas under the Common Agricultural Policy<sup>11</sup> are all practical examples of allowances with some degree of transferability.

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<sup>8</sup> Council Directive 96/61/EC of 24.09.1996 concerning integrated pollution prevention and control.

<sup>9</sup> Relevant Community law: Council Regulations No. 594/91, No. 3952/92 and No. 3093/94. This implementing legislation provides for both production and consumption quotas to be allocated to individual companies on the basis of historical production levels. International transfers were limited initially to 10% and later 15% of the starting allocation. Later these restrictions were abolished and unlimited flexibility was allowed subject to the overall international production limits being complied with.

<sup>10</sup> The basic legal framework is contained in Council Regulation N° 3760/92. Additionally, there are annual implementation regulations, e.g. Council Regulation N° 48/99. The control process is determined by Council Regulation N° 2847/93. The quota, or Community “Total Allowable Catch”, is allocated between the Member States, with the Community retaining a share in some cases. The allocation of quotas to fishing vessels registered in Member States is not covered by Community law and is hence subject to decisions taken in the Member States. The transfer of quotas between Member States is authorised, although there are constraints on flexibility.

<sup>11</sup> The main elements of the legal framework can be found in Council Regulations N° 856/84 and 3950/92, and Commission Regulation N° 536/93. In the context of Agenda 2000, a new Council Regulation replacing

The attractive features of emissions trading, however, can only be realised in practice when accompanied by a robust monitoring and compliance regime at reasonable cost. Robust monitoring will also help strengthen the quality of information about pollution levels. Moreover, to ensure compatibility with emissions trading under the Kyoto Protocol, emissions allowances within the European Community should be specified in a number of tonnes of carbon dioxide-equivalent that can be emitted.

#### **4. THE EUROPEAN COMMUNITY, EMISSIONS TRADING AND THE KYOTO PROTOCOL**

##### **4.1. The EU's "burden sharing" agreement**

In Kyoto, it was agreed in Article 4 of the Protocol that the EU could redistribute its targets among the Member States as long as the outcome still amounted to an overall reduction for the European Community of 8%. Political agreement on that redistribution was reached in June 1998, and is referred to as the "burden sharing" agreement<sup>12</sup>. When the European Community and the Member States ratify the Protocol, they will have to officially notify these redistributed targets to the Secretariat of the Convention on Climate Change. However, the "burden sharing" agreement does not constrain the use by the Member States or the European Community of the Kyoto Protocol's "flexible mechanisms".

##### **4.2. A Community emissions trading system between companies**

The Framework Convention on Climate Change and the Kyoto Protocol are agreements between Parties that, with the exception of the European Community, are all Governments of sovereign states. Companies, on the other hand, are regulated at the national level, and also, in the case of the companies operating within the EU, also at Community level. Any action by companies falls under the responsibility of the Party where the emissions source is located<sup>13</sup>.

The Kyoto Protocol provides for international emissions trading between Parties, without however containing any obligation for a Party to be involved in such trading. No explicit mention is made of "entity" involvement in the Article 17 that refers to emissions trading<sup>14</sup>. The 6<sup>th</sup> Conference of the Parties to the UNFCCC may or may not specifically address the question of "entity" involvement in emissions trading.

It is the Commission's view that the involvement of companies<sup>15</sup> in emissions trading represents a unique opportunity for a cost-effective implementation of the

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N° 3950/92 will be forthcoming. The allocation of the quotas to Member States is based on historical production figures. Member States then allocate their national quotas to individual producers. The quotas may not be transferred across Member State borders. Monitoring and reporting requirements for marketed milk and milk products are regulated at Community level. Financial penalties apply to Member States that have exceeded their quota.

<sup>12</sup> The relevant percentages per Member State can be found in Annex 1 of COM(1999)230 final of 19.05.1999.

<sup>13</sup> Any emissions trading organised at Community level would be a domestic measure for the European Community (which is a distinct Party to the Kyoto Protocol, listed in Annex B thereof), and would not be identical to international emissions trading under Article 17 of the Kyoto Protocol.

<sup>14</sup> This contrasts with Articles 6 and 12 concerning joint implementation projects and the Clean Development Mechanism respectively, where the participation of "entities" is specifically mentioned.

<sup>15</sup> Reference to "companies" is used, but emissions trading may be extended to individual sites (or "sources") of emissions, of which a single company may have several. The emissions from individual sites, or "sources", will be included within the greenhouse gas inventory for the Member State on whose

Kyoto commitments. In this respect, it should be noted that the Kyoto Protocol already implicitly allows for Parties to mutually recognise allowances traded between companies in their respective “domestic” schemes – matched by corresponding adjustment to the respective Parties’ assigned amounts. In such a case, a Community or Member State scheme could be linked to those of Parties outside the EU<sup>16</sup>. This would represent a further opportunity for lowering costs of complying with the Kyoto Protocol.

#### **4.3. A “learning-by-doing” approach**

In June 1998, the Commission stated that “the Community could set up its own internal trading regime by 2005”<sup>17</sup>. There would be considerable benefits in terms of “learning-by-doing” that would ensure that the Community was better prepared for the start of international emissions trading from 2008 under the Kyoto Protocol. Such experience would give Community actors practical familiarity, and even a leading edge, in using the instrument.

After 2008 such “domestic” systems may continue, but should be compatible with the international emissions trading under the Kyoto Protocol covering 6 greenhouse gases and sinks. It is very important, therefore, to design a “domestic” emissions trading from the outset in such a way as to be open to gradual extension, in terms of geographical, economic sectors, and gas coverage.

Emissions trading does not of itself reduce emissions. It simply provides incentives to find the lowest cost of achieving a given amount of emissions reductions. The wider the scope of the system, the greater will be the variation in the costs of compliance of individual companies, and the greater the potential for lowering costs overall. This argues in favour of a comprehensive trading scheme across different Member States covering all 6 greenhouse gases and sinks, and encompassing all emission sources. However, there are sound scientific and practical reasons why the Community might not wish to establish a comprehensive scheme at this stage. There are considerable uncertainties surrounding the emissions of the fluorinated gases and the absorption of carbon dioxide by sinks. Allocating allowances, monitoring emissions and enforcing compliance of small mobile emitters, such as private cars, raise complex technical and administrative issues.

Consequently, if the Community wishes to follow a prudent step-by-step approach in the development of emissions trading, it should initially confine itself to large fixed point sources of carbon dioxide, where monitoring and supervision of the system is

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territory the site is located, as well as within the inventory of the European Community. The Kyoto Protocol uses the terms “legal entities” in the context of joint implementation, and “public and/or private entities” in the context of the Clean Development Mechanism. Such “entities” may include companies, other legally constituted non-governmental organisations and public entities such as municipal authorities.

<sup>16</sup> Given the differences in the price of allowances that should be expected between the different “domestic” trading schemes of different Parties, connecting two schemes would be like connecting two vases: the level of the water (or the price of allowances) in both vases would be the same.

<sup>17</sup> COM(1998)353 final dated 03.06.1998 “Climate Change – Towards an EU Post-Kyoto Strategy”.

more feasible. Carbon dioxide (CO<sub>2</sub>) emissions constitute approximately 80%<sup>18</sup> of the Community's greenhouse gas emissions.

Similar orientations can be observed in some Member States as well as in the private sector. For example, Denmark has already passed legislation through its national Parliament setting up a limited trading system for carbon dioxide quotas between the largest electricity producers to start sometime within the next year<sup>19</sup>. Several other Member States are actively considering the use of domestic emissions trading before 2008. A number of schemes are already being developed or considered by individual companies, sectoral or even multi-sectoral associations. The Commission welcomes these initiatives, and the insights that they can provide.

## **5. THE ROLE OF THE EUROPEAN COMMUNITY**

### **5.1. The economic case for emissions trading in the EU**

As already observed, the potential savings from emissions trading increase with the coverage of the trading scheme. Estimates show that Community-wide trading by energy producers and energy intensive industry could reduce the costs of implementing the Community's Kyoto commitments by nearly a fifth compared with separate Member State schemes that did not allow for cross-border trading. This represents a potential cost saving of approximately €1.7 billion a year. Such lower costs increase the likelihood of compliance with our international obligations.

A Community emissions trading scheme would lead to one single price for allowances traded by companies within the scheme, thereby ensuring a level playing field for all, irrespective of which Member State they were in, while different unconnected national schemes would result in different prices within each national scheme.

Today, no price data are available resulting from real life experiences concerning greenhouse gas emissions trading. As a result, only empirical estimates can guide our reflections. These show a large variety, ranging from €5 to some €58 per tonne of carbon dioxide equivalent traded between industrialised countries<sup>20</sup>.

More details on the economic analysis can be found in Annex 1.

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<sup>18</sup> European Environment Agency technical report no.19 - May 1999: "Annual European Community Greenhouse Gas Inventory 1990-1996".

<sup>19</sup> The Danish emissions trading scheme is enacted by Act N° 376 of 2 June 1999 on quotas for electricity production. It is intended to last until 31 December 2003. The date of commencement has still to be fixed. It covers emissions of carbon dioxide from approximately 15 of the largest electricity producers. There has been a free allocation of allowances according to both historical criteria (actual emissions during a reference period) and technical criteria (that favour more energy efficient production). In the case of producers emitting more than their annual allowance, a fine of DKK 40 (about €5.38) is levied for every excess tonne of CO<sub>2</sub> emitted. The scheme is still under consideration by the Commission in accordance with the state aid rules.

<sup>20</sup> So called "Annex B" countries, referring to Annex B of the Kyoto Protocol.

## **5.2. Protecting the internal market**

The development of emissions trading within the Community, while making an important contribution to the protection of the environment by limiting emissions, must nevertheless avoid creating barriers to trade, restrictions to the right of establishment of companies and distortions of competition which would damage the internal market. Emissions trading should therefore form part of a coherent framework of common and co-ordinated policies and measures for reducing greenhouse gas emissions and implementing the Kyoto commitments. Furthermore, in developing an emissions trading scheme within the Community that respects the rules of fair competition within the internal market, the Community will also help avoid possible incompatibilities with multilateral agreements on trade.

Industry needs to be sure of receiving fair treatment in every Member State and between comparable companies in different Member States. Maximum simplicity of rules with which companies have to comply throughout the Community is also a desirable objective. Simplicity would facilitate effective and efficient administration and enforcement of any emissions trading scheme. There is, however, a trade-off between providing greater equality of treatment and more simplicity on the one hand, and Member States maintaining greater autonomy on the other.

Member State autonomy would require a case-by-case appraisal of each Member State scheme. This would be less transparent and more complicated for companies. Some comparable companies might be covered by national emissions trading schemes and others might not. The sectors involved might vary from Member State to Member State. And the specific rules and procedures may be expected to vary across the Community. Such a segregated market would risk running counter to the objectives of the internal market, although different policy approaches might be justified as an outcome of different national priorities.

## **5.3. Defining the respective roles of the Community and the Member States**

Conceptually, emissions trading within the European Union could be organised at a number of different levels, with varying degrees of Community intervention. These levels could range from a Member State driven scheme, where the Community's role would be limited to maintaining oversight of national schemes to ensure conformity with Community law and to monitor progress with Community commitments. At the other end of the spectrum could be a harmonised Community-wide scheme in which the design and regulation of all the essential elements would be agreed at Community level, and Member States would implement the scheme in a consistent manner with only limited regulatory discretion.

A "middle" option would be to develop a Community scheme, but leaving Member States with some degree of choice whether or not, and to what extent, they participate, and possibly some choice in the key implementing rules.

The elements that should be considered in this context are:

- How to ensure that comparable companies in different Member States are required to undertake equivalent effort whether they are involved in emissions trading or subject to other policies and measures, thereby minimising distortions of competition within the internal market;

- How to distribute emissions allowances so as to prevent indirect discrimination and minimise distortions of competition;
- How to ensure maximum synergy with existing environmental legislation;
- How to ensure effective monitoring, reporting, verification and enforcement;
- How to ensure compatibility with the Kyoto Protocol's international emissions trading.

That the Community has a role in the protection of the internal market and in respecting international commitments that it has entered into is not in question. The debate on the Community's role should rather be focussed on what form this role should take.

## **6. POLICY OPTIONS RELATED TO THE SCOPE OF AN EC EMISSIONS TRADING SYSTEM**

Getting started is the greatest challenge, and deciding which sectors and which sources should be initially covered by an emissions trading scheme is central.

### **6.1. Sector coverage**

In defining which sectors should be covered by emissions trading, a number of criteria need to be considered. Important criteria are environmental effectiveness, economic efficiency, the potential effects on competition, administrative feasibility and the possible existence of alternative policies and measures.

Starting with a relatively small number of economic sectors and sources that contribute significantly to total emissions and for which the costs of reduction efforts differ significantly would substantially satisfy these criteria.

The Large Combustion Plant<sup>21</sup> and Integrated Pollution Prevention and Control<sup>22</sup> Directives appear to offer a useful starting point for defining the trading system population. These Directives do not cover all sectors; nor do they include smaller sources within the sectors that are covered. However, the potential competitive distortions caused by leaving out some sectors, or smaller emission sources within the covered sectors can be limited by ensuring that equivalent policies and measures are imposed on sectors and sources not covered by the trading system.

Table 1 illustrates that a limited number of sectors would cover approximately 45% of EU carbon dioxide emissions<sup>23</sup>. In the iron and steel, refining, inorganic chemical (sulphuric acid and nitric acid) and paper pulping sectors virtually all plants are large

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<sup>21</sup> Directive 88/609/EEC of 24.11.1988, as modified by Directive 94/66/EEC of 15.12.1994.

<sup>22</sup> Council Directive 96/61/EC of 24.09.1996 concerning integrated pollution prevention and control, and in particular its Annex I.

<sup>23</sup> Estimate from Paper "Design of a practical approach to greenhouse gas emissions trading combined with policies and measures in the EC", Center for Clean Air Policy, Washington DC, (forthcoming: <http://www.ccap.org>). This paper was prepared as part of the study contract "Designing Options for Implementing an Emissions Trading Regime for Greenhouse Gases in the EC" led by the Foundation for International Environmental Law and Development (FIELD): <http://www.field.org.uk/papers/papers.htm>.

point sources and expected to be for the foreseeable future. In the case of the cement industry, the number of cement plants in the EU is small, and so all plants could be included. In the heat and power sector it seems feasible to include all plants with thermal capacity of greater than 50 MW<sub>th</sub><sup>24</sup>.

**Table 1: Possible industry sectors to include in an emissions trading system**

| <b>Sector</b>   | <b>Percentage of EU15 CO<sub>2</sub> Emissions<sup>25</sup></b> |
|---|---|
| Electricity and heat production                           | 29.9%   |
| Iron and Steel  | 5.4%  |
| Refining  | 3.6%  |
| Chemicals   | 2.5%  |
| Glass, pottery and building materials (including cement ) | 2.7%  |
| Paper and printing (including paper pulping)              | 1.0%  |
| <b>Total</b>  | <b>45.1%</b>  |

Source: EUROSTAT 1997 figures.

The Large Combustion Plant and Integrated Pollution Prevention and Control Directives also cover sources in some sectors that are not included in the above table. Since the economic gains from trading arise from differences in abatement costs between companies covered by the trading system, this would argue in favour of as wide and as varied a sectoral coverage as possible. It is recognised that emissions trading is likely to be of particular interest to those sectors where the average cost of reducing emissions is highest.

The key to limiting risks of distortion between large point sources and small, and between “trading” sources and “non-trading” sources, is the application of strict policies and measures to non-trading sources, with the possibility for these firms to voluntarily opt-in to the trading system.

## **6.2. What level of diversity is possible within the Community?**

A critical question in the design of emissions trading within the European Community is whether the same sectors should belong to the trading population across the EU.

### *6.2.1. A common Community scheme*

An emissions trading scheme for which the coverage has been the subject of agreement at Community level would provide optimal conditions for equal competition between participants in different Member States and would offer

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<sup>24</sup> Radunsky & Ritter (1996) CORINAIR 1990 Summary Report 3: Large Point Sources, Topic Report 20/96, European Environment Agency, 1996.

<sup>25</sup> Energy related for 1997.

maximum transparency and legal certainty to all companies. Moreover, such a solution would allow for significant economic benefits by virtue of the greater differences in abatement costs between the companies involved. This would have to involve an explicit decision at Community level about which sectors belong to the trading population and which sectors do not.

#### 6.2.2. *A co-ordinated Community scheme*

To date, however, different Member States have demonstrated various degrees of interest in the emissions trading instrument. Some are starting up a policy discussion, while others are well advanced in the preparation of concrete schemes. It may be that not all Member States are likely to be ready to participate in a Community scheme at the same time.

A key element in the debate could therefore concern how to secure an optimal synchronisation over time of Member States participating within a Community scheme before 2008. Two alternative options can be considered, namely an “opt-in” versus an “opt-out” system.

##### *The “Opt-in” option*

The first option would concern a common scheme that Member States would all agree on at the outset, and which Member States could, if they wished, “opt-in” to. It might work as a transitional stage in moving towards a common Community system to which economic sectors of different Member States join gradually.

It would be essential, however, for any co-ordinated scheme to ensure a level playing field for companies in competition with others located in different Member States. For that reason, a considerable extent of co-ordination of the essential elements of such a differentiated implementation strategy would be necessary and would be highly complex to manage. In this case, the Community would have to have an active role in overseeing what the Member States were doing, and in evaluating the effects on competition between comparable companies in different Member States. If different Member States wished to include different sectors and different gases, the various combinations could be too numerous to be able to ensure coherence and transparency.

##### *The “Opt-out” option*

A possible alternative option would be an “opt-out” scheme, whereby the Community as a whole decides on all sectors to be covered by the trading system in principle. However, some Member States may “opt-out” from that agreement in respect of certain sectors, or completely, and for a limited period of time. In this scenario, the possible variations should be more limited. Its advantage would be to offer greater simplicity, and a greater degree of transparency, than the “opt-in” option.

The condition for allowing these alternatives of “opt-in” or “opt-out” should be that sectors that are not covered by the Community scheme are regulated by other policies and measures that represent at least a similar economic effort in terms of emissions abatement.

### 6.2.3. *EU enlargement*

The gradual extension of the system in terms of geographical coverage is also an important issue, as in the not too distant future, new Member States are likely to join the EU. Any system developed, therefore, should be open to subsequent adaptation and extension. Under the Kyoto Protocol's Article 4, the EU's "burden sharing" agreement would not be changed for the first commitment period (2008 to 2012) by any enlargement of the EU. However, through a system of mutual recognition of domestic systems, there may be scope for including new EU Member States in a Community system. For any second commitment period from 2012, new Member States could be integrated into the Community "bubble".

Finally, the development of a Community scheme would have to take account of the particular status of non-EU countries in the European Economic Area, that may have their own emissions trading schemes or wish to be included in the Community scheme. In this context, the "burden sharing" agreement would remain for the 15 EU Member States, and the possibility of joining or enlarging the Community system through mutual recognition could be further explored.

### 6.3. **Questions:**

*Question 1: Which sectors should be covered by emissions trading within the Community? Do the LCP and IPPC Directives offer a useful starting point for defining the sectoral coverage of a Community emissions trading system?*

*Question 2: Should there be a common emissions trading scheme within the European Community for certain sectors in the interest of fair competition, maximum transparency and legal certainty for companies?*

*Question 3: Would the flexibility offered by a co-ordinated scheme such as "opting-in"/"opting-out" be compatible with the requirements of the internal market, or would any advantages of such flexibility be outweighed by increased complexity?*

*Question 4: What scope is there for individual Member States to include more sectors in their domestic trading scheme than might be covered by a Community scheme?*

## 7. **POLICY OPTIONS RELATED TO THE INITIAL ALLOCATION OF EMISSION ALLOWANCES**

Before actual trading can take place, the allowances have to be allocated.

Policy options related to the initial allocation concern 3 levels: between "trading" and "non-trading" parts of the economy, between trading sectors, and between companies. A Community dimension exists in all three, but may be assured in different ways.

## **7.1. Defining the overall allocation for the trading sectors at Community and Member State level**

A critical task is to define an equitable burden for the sectors or actors included within an emissions trading system compared to those outside<sup>26</sup>.

The initial allocation does not imply that every company will have to deliver an 8% reduction in its emissions during the period 2008 to 2012, reflecting the Kyoto Protocol's overall 8% reduction commitment for the EU as a whole, nor the respective percentages fixed for each Member State under the "burden sharing" agreement. There are clearly some sectors (e.g. transport) where an 8% reduction would be an extremely costly target to meet. Other sectors may find such a target relatively inexpensive to meet. It will be less costly for the economy as a whole for sectors where the costs are lowest to make the greatest contribution.

The Commission services are at present undertaking empirical research on the relative costs of abatement across different sectors in the different Member States. The results may guide policy-makers towards the lowest cost options – and so assist in fixing the appropriate amount of emissions to be allocated to the sectors covered by the trading system. The results of this research will be the subject of scrutiny and discussion in the appropriate EC Monitoring Committee<sup>27</sup>.

During the period 2008 to 2012, a Member State which develops its own trading scheme will have to decide ultimately how many tonnes will be included in the emissions trading regime, and how many tonnes of emissions reductions would be achieved through other policies and measures. Similarly, even a Community emissions trading scheme before 2008, with agreed sectoral coverage, would have to result in a pre-determined number of allowances included under the trading system for each Member State. After 2008, within the framework of the "burden sharing" agreement, Member States would have to agree how much would be allocated to the trading sectors in each Member State, and what share of the reduction in emissions would be tackled by other policies and measures. This will provide a transparent framework within which Member States could distribute the allowances to companies on their territory.

## **7.2. The allocation of emission allowances to companies by Member States**

### *7.2.1. General approach*

How the permits are allocated does not affect the environmental outcome. It can nevertheless be expected that negotiations concerning the allocation of allowances will not be easy. Pressurised by divergent interests, some Member States may favour action in some sectors (and/or companies) more than others. They may, for example, be tempted to exempt particular sectors from making any contribution to the common goal, or set unchallenging sectoral targets. This could give rise to complaints from competing companies in other Member States.

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<sup>26</sup> Such an equitable burden has also to be defined in respect of all other policies and measures.

<sup>27</sup> As established by Council Decision 93/389/EEC of 24.06.1993 for a monitoring mechanism of Community CO<sub>2</sub> and other greenhouse gas emissions, amended by Council Decision 1999/296/EC of 26.04.1999.

According to Community law, such concerns could fall under existing state aid and internal market provisions because they essentially concern potentially distortionary aid to particular sectors or companies. The Commission is bound to act in accordance with its obligations under the Treaty in view of safeguarding fair competition and freedom of establishment within the internal market. The Commission could deal with such cases on an *ad hoc* basis, as it is doing currently in the case of the Danish emissions trading scheme, and/or could spell out its criteria in a policy document.

However, the need for and nature of such intervention will depend very much upon the choices that are made. If the Community were to agree on the quantity of the emissions of the trading sectors in each Member State, possible distortive allocations to individual sectors or companies would be significantly limited. Hence, existing guidelines for state aid in the field of the environment would be sufficient to check whether allowances allocated to companies would respect EC competition law.

On the contrary, lack of agreement on what quantity of emissions should be allocated to the trading sectors in each Member State will require detailed and tight guidelines on how allocations are made to individual sectors and companies, and close scrutiny of every single case. Companies and sectors within individual Member States would have an interest in ensuring an equitable distribution by their Government of allowances between the trading sectors of that Member State.

#### 7.2.2. *Key issues*

A key issue in the Commission's investigations, either as part of its *ad hoc* analysis of cases, or as part of a new set of guidelines, will concern issues related to possible discrimination against "foreign" ownership. In principle, Member States should use the same system of allocation for all companies operating within their territory.

Another basic issue in the Commission's assessment will concern the methods of the allocation. There are basically two ways to allocate: auctioning and allocation free of charge. In the context of emissions trading, the latter is often referred to as "grandfathering"<sup>28</sup>. It is possible to combine these two methods of allocation, and there are a number of ways of doing both. However, once the overall allocation for the trading sectors has been fixed, the method of allocation does not effect the environmental outcome, which is determined by the overall allocation and the strength of monitoring and enforcement procedures.

Periodic auctioning is technically preferable, as it would give an equal and fair chance to all companies to acquire the allowances they want in a transparent manner. Auctioning applies the "polluter pays" principle. The revenues raised by governments could be re-cycled in a variety of ways, even keeping the overall revenue effect neutral, or by using the revenues to promote energy efficiency investments, research and development or public investment in other greenhouse gas abatement efforts. Auctioning avoids the need to take the difficult and politically delicate decisions about how much to give each company covered by the trading scheme. The complex issues raised above about state aid and competition would

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<sup>28</sup> In a strict sense, a "grandfathered" right is not related to the notion of the allocation free of charge of a realisable asset, but rather to a historical right to do something, such as vote, that can be transmitted to descendants or retained by a legal entity during its continued existence, but which is not transferable beyond those pre-determined limits.

largely disappear. It would also guarantee fair terms for new entrants to join the system as they, like existing sources, would also have the same opportunity to buy the allowances that they needed.

Companies, however, could argue that auctioning would require paying “up front” for what had not been paid for in the past. By “grandfathering”, something of value is given away for free. The basis for free allocation can vary. A simple historical emissions approach, e.g. based on emissions in 1990 like the Kyoto Protocol, would reward the largest emitters at that time and penalise those who, before 1990, had already taken early action. A refinement of the “grandfathering” option would be free allocation on the basis of performance standards or “benchmarks” (e.g. tonnes of CO<sub>2</sub>-equivalent per tonne of steel produced in a certain year). Whatever the method of free allocation, it should not necessarily be considered an easy option.

A key issue to be debated now is whether or not the Community should impose one or the other option, or leave it to the Member States either to auction allowances or to “grandfather”. A company in one Member State that has to buy allowances through auctioning may feel disadvantaged in relation to a competitor in another Member State that has been “grandfathered” its allowances for free. Depending on how “grandfathering” is undertaken in different Member States, companies may also feel disadvantaged in relation to their competitors, and hence competition distortions could arise.

However, notwithstanding the possible perceived discrimination by companies, Community law does not prevent Member States from discriminating against “their” own companies, or companies established on their territory, unless bias can be demonstrated discriminating against “foreign” owned sources, or the entry into the market of “foreign” new entrants. Obviously, in the latter case, such discrimination would give rise to state aid concerns.

### **7.3. The case of new entrants**

The case of new entrants warrants special mention because, in the case of allowances being “grandfathered”, companies that were not given allowances free at the outset should still be able to obtain them easily when they enter the market. For that reason, Member States should ensure that allowances are available for new entrants, which may be “foreign” companies wishing to enter the market, on equal terms<sup>29</sup>. This can most simply be done by Member States distributing allowances to new entrants on similar terms as done for already established companies.

However, the common perception that newcomers are always treated unfavourably by the “grandfathering” of allowances may have to be qualified. In environmental terms, there is no real difference between an existing company increasing its emissions through increased output, and a new entrant wanting to start producing additional output. Both cases lead to increased emissions. New firms, unlike old, have made no investments before the trading scheme was introduced, so will have no costs to bear in respect of “stranded assets” (investments made without the knowledge of subsequent policy instruments).

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<sup>29</sup> It is not just discriminatory measures that are prohibited under the Treaty, but any measures that are liable to prohibit or otherwise impede the activities of non-national economic operators, even if such rules apply without distinction to nationals and non-nationally owned companies alike.

A further element to mention on the issue of new entrants is that of “opportunity cost”. Although existing firms may be “grandfathered” allowances, their use of these allowances is not free. If a company uses the allowances itself, it foregoes the revenue that it could have received by selling them. Thus, the company should include this lost revenue in its production costs. Seen from this perspective, “grandfathering” need not confer a competitive advantage on existing firms compared with new entrants. While existing firms have received an asset which new entrants must purchase, the receipt of this asset does not make the existing firms better or more efficient producers than they were before. On the other hand, new entrants may have less access to capital than existing companies that have been given a realisable asset, and it is in respect of this that new entrants may be disadvantaged.

Finally, in a trading scheme where there are only a very limited number of companies from a single sector, there could be scope for exercising market power. Established companies may conceivably hoard allowances in order to increase the difficulty of entering the market. However, such concerns are greatly reduced by increasing the number of participants in a trading scheme.

#### **7.4. Questions:**

*Question 5: Should the overall amount of allowances allocated to the trading sector in each Member State be subject to agreement at Community level?*

*Question 6: Should the way in which allowances are allocated to individual companies be the subject of agreement at Community level? Or, do you consider detailed guidelines based on the state aid provisions and other rules of the Treaty to be sufficient to safeguard fair treatment?*

### **8. POLICY OPTIONS RELATED TO THE SYNERGY WITH OTHER POLICIES AND MEASURES**

It still has to be clarified how technical regulation, taxation and environmental agreements are respectively substitutes or complementary to a new emissions trading instrument.

#### **8.1. The relation with technical regulation**

Technical regulation is the most widely applied instrument of environmental policy in the European Union. It has proven to be effective in reducing environmental pollution, but there has been much debate on how to make the current body of environmental legislation more cost-effective, in particular in combination with economic instruments. In practice, current technical regulation covers mainly pollutants other than carbon dioxide, and emissions trading for carbon dioxide would leave the technical regulation on these other pollutants intact. Alternatively, in the absence of emissions trading, the technical regulations could be made more specific with regards to greenhouse gases and climate change.

### *Regulation concerning environmental emissions from plants (“point sources”)*

Some of the most important instruments concerning technical regulation of plants concern the Large Combustion Plant (LCP)<sup>30</sup> and the Integrated Pollution Prevention and Control (IPPC) Directives<sup>31</sup>. The technical standards are based on so-called “Best Available Techniques (BAT)”. Although more specifically focussed on pollutants that are harmful to health and the environment, the IPPC Directive also covers greenhouse gases if they are “likely to be emitted from the installation concerned in significant quantities”. Competent authorities issue permits on the basis of, *inter alia*, “the consumption of raw materials (including water) used in the process and their energy efficiency...”. The introduction of an emissions trading regime will require a clarification of its relationship with the standards and procedures incorporated into the IPPC Directive. At present the IPPC Directive does not allow permits to be transferable, but for an emissions trading system to be introduced within the context of the IPPC Directive, permits covering the relevant greenhouse gases would have to be given “tradable” status.

An alternative option is to keep emissions trading completely separate from the existing technical regulations mentioned above. Any technical standards already in place for pollutants other than greenhouse gases would remain in place. For greenhouse gases, technical standards could still serve as minimum requirements. Moreover, the concept of “Best Available Techniques” could be considered as a useful element in the initial allocation process, in particular in the case of “grandfathering” allowances. Information concerning “BAT” in specific sectors could then play a role as a technical criterion along with benchmarks and historical emissions data.

### *Product standards (“diffuse sources”)*

Technical regulations concerning products will continue to play a major role in any climate policy, irrespective of whether an emissions trading regime is in place or not. This is particularly the case for emissions generated by the household and transportation sectors, which would not be covered by the emissions trading regime, at least not initially. Particular attention will have to be paid on how to speed up significantly the use of energy-efficient products in particular through technical standards, economic and fiscal incentives, voluntary initiatives by and environmental agreements with industry, and improved consumer information such as eco-labelling.

## **8.2. The relation with environmental agreements**

Environmental agreements with industry have been introduced at national and even Community level<sup>32</sup>. They have received a lot of attention as they offer a more flexible solution to industry compared to technical regulation, while avoiding competitiveness problems from high unilateral energy taxes. They have been particularly attractive in the field of energy efficiency. Clearly, whenever considering environmental agreements it is essential to bear in mind their contribution to the

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<sup>30</sup> Directive 88/609/EEC of 24.11.1988, as modified by Directive 94/66/EEC of 15.12.1994.

<sup>31</sup> Council Directive 96/61/EC of 24.09.1996 concerning integrated pollution prevention and control.

<sup>32</sup> The term “environmental agreements” is used for the sake of simplicity. At Community level, there is in fact no legal agreement strictly speaking, but a unilateral commitment of the industry that the Commission takes note of and “covers” by a corresponding recommendation addressed to industry.

overall Community target under the Kyoto Protocol of minus 8% that has already been set.

The Commission takes a positive view on the use of such environmental agreements at industry level<sup>33</sup>. The European Commission has expressed its support of the commitments made by the European Automobile Manufacturer's Association<sup>34</sup> (ACEA). Recently, similar agreements have been reached with the Japanese (JAMA) and Korean (KAMA) car manufacturers<sup>35</sup>. Such agreements are likely to contribute to substantial improvements in the energy efficiency of new vehicles and hence contribute significantly to the EU's Kyoto commitments. However, there is the need for a proper transparent framework for environmental agreements concluded at Community level.

There are several elements to be considered in the relationship between environmental agreements and emissions trading. A particular question concerns the issue whether emissions trading would be allowed within the context of an environmental agreement, and if so, on what conditions. The question could be relevant in the case of an agreement that has been entered into but subsequently can not be complied with, in which case the buying in of emissions allowances could offer a solution to come back into compliance. Conversely, in the case of "over-achieving" in respect of a previously agreed environmental agreement, the question arises whether the surplus emissions reductions could be sold on the market. Furthermore, there may be innovative solutions whereby individual companies within a sector use emissions trading with each other with a view to ensuring compliance by the sector as a whole with an environmental agreement entered into by that sector.

Two major elements have to be addressed in this context: the responsibility of an individual company *vis-à-vis* the sector who signed the agreement, and the nature of the environmental objective.

#### *Responsibility at the level of the sector or the company*

A critical element in any compliance regime, either of an agreement or a trading regime, concerns the respective responsibilities assigned in a clear and transparent manner to the different players. There seem to be two possibilities for allowing a combination of both emissions trading and environmental agreements. Either the environmental agreement of the sector specifies the exact commitment of every individual company, so that each company knows the exact basis upon which it can enter the trading market. Or, the body representing the sector as a whole receives legal status, and can participate in the trading sector on behalf of the sector.

A related critical element in the development of useful bridges between both instruments concerns the question of independent monitoring and verification. While a solid and credible environmental agreement requires such independent assessment at the level of the sector, any environmental agreement allowing for trading will

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<sup>33</sup> COM(96)561: Communication from the Commission to the Council and the European Parliament on Environmental Agreements.

<sup>34</sup> COM(1998) 495 final.

<sup>35</sup> COM(1999) 446 final.

require such an independent assessment at the company level as well, and the emissions from individual sources will have to be verified.

#### *Targets related to energy efficiency or to carbon emissions*

Most of the environmental agreements to date concentrate on efficiency targets based on the environmental performance per unit of output. Such agreements do not ultimately guarantee a pre-determined environmental result if output rises more than anticipated.

Emissions trading requires the establishment of an allowance for every actor that constitutes a “carbon target”, expressed as a number of tonnes of carbon dioxide equivalent similar to the Kyoto Protocol’s targets for Parties. Such environmental agreements could serve as a stepping-stone towards participation in an emissions trading regime. The “carbon target” negotiated with a sector could indeed be considered as a useful element in the initial allocation debate raised under section 7.2.

Some Member States, however, are exploring how to combine environmental agreements based on energy efficiency targets with emissions trading. As such an objective is not expressed in tonnes of carbon dioxide equivalent, it seems difficult to see on what basis any sector or company involved could participate in a market transaction. This question needs further investigation and clarification. Such a combination, however, is likely to increase the complexity of emissions trading, and therefore requires further study.

### **8.3. The relation with energy taxation:**

On energy taxation, little progress has been made at Community level in recent years. However, an increasing number of Member States have extended the scope of energy taxation to cover not only mineral oils, but also competing sources of energy such as electricity, and have increased the minimum levels of taxation on mineral oils at a national level.

Energy taxes and emissions trading should be designed in such a way that they act as complementary instruments for covering the totality of emissions.

Additional<sup>36</sup> energy taxes could be focussed more on smaller or mobile sources whose emissions are more difficult or expensive to monitor. Energy taxes could also be concentrated on emissions related to “non-process costs”, such as space heating for industrial and commercial use, that are not exposed to the same pressures of international competition.

Emissions trading, on the other hand, could rather cover more the emissions related to the production of goods in sectors (“process industries”) that are exposed to keen international competition. It is important to note in this context that unlike taxation, greenhouse gas emissions trading is likely to be widely used in a similar way for

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<sup>36</sup> In a Community context, “additional” to existing Community provisions relating to the taxation of mineral oils, such as envisaged by the Proposal for a Council Directive restructuring the Community framework for the taxation of energy products COM(97)30 final of 12 March 1997.

private companies throughout the industrialised world, thereby minimising possible negative effects on international competitiveness.

The combined use of these two instruments should be further explored. The link should also be made to the way in which permits are allocated to companies, and in particular auctioning of allowances as discussed in section 7.2 above.

#### **8.4. How to assure equivalence between emissions trading and other policies and measures**

Industries must be confident of receiving comparable treatment to their competitors, and especially so in the case of a co-ordinated Community emissions trading system. In this context, it is important to extend the Monitoring Mechanism<sup>37</sup> to incorporate the costing of policies and measures in order to compare more meaningfully price developments on emissions trading markets. The results of the further empirical work referred to in section 7.1 will contribute towards ensuring such equivalence.

#### **8.5. Questions**

*Question 7: Is it agreed that a balance has to exist between sectors engaged in emissions trading within the Community on the one hand, and non-trading policies and measures applied to other sectors on the other?*

*Question 8: How can environmental effectiveness (in terms of fulfilling the Kyoto Protocol's commitments) and transparency be safeguarded using a mix of emissions trading, energy taxes and environmental agreements with targets based on energy efficiency per unit of output?*

### **9. POLICY OPTIONS RELATED TO COMPLIANCE AND ENFORCEMENT**

#### **9.1. The importance of strict compliance and enforcement provisions**

The strength and environmental integrity of any emissions trading regime will largely depend upon its compliance provisions and a robust enforcement regime. The purpose of strict compliance and enforcement is to enhance confidence in the trading system, make it work in an efficient way in accordance with the rules of the internal market and at the same time increase the likelihood of achieving the desired environmental result.

For a Community emissions trading scheme to function properly, adequate monitoring, tracking and reporting is a prerequisite. Verification and control of the data provided should lead to the detection of cases of non-compliance, against which enforcement action must then be undertaken. In addition to the *ex post* verification and enforcement, the existence of strong penalties would have a deterrent effect that will create an incentive to companies to avoid non-compliance.

Such penalties should be foreseeable and significantly exceed the cost of complying. Furthermore, emissions trading may require more rapid and *ad hoc* answers to

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<sup>37</sup> Council Decision 93/389/EEC of 24.06.1993 for a monitoring mechanism of Community CO<sub>2</sub> and other greenhouse gas emissions, amended by Council Decision 1999/296/EC of 26.04.1999.

infringement of the rules that are better adapted to the speed of functioning of a market mechanism. Specific sanctions could also include an exclusion from the trading system, for example in the case of repeated non-compliance. The success in compliance terms of the US sulphur trading scheme is largely due to the strictness of the enforcement regime, including stiff penalties for non-compliance.

## **9.2. Compliance and enforcement *vis-à-vis* companies**

Generally within the EU, the checking and enforcement of compliance by companies with Community environmental legislation is mostly carried out by the Member States. In the case of emissions trading too, Member States should in the first instance be responsible for assessing compliance by their companies. Companies would have to monitor and report to national authorities their actual emissions and track allowances traded. The aggregated results should be communicated to the Commission.

There are several options to facilitate these tasks and optimise the results. To reduce administrative burdens on the emissions trading regime, Member States may want to employ private sector auditors in the verification process. They could, for example, adopt a system of environmental verifiers such as those accredited by Member States on the basis of common criteria laid down under the Community's Eco-Management and Audit Scheme (EMAS)<sup>38</sup>. Another option to further enhance the credibility of the system would be to enact an additional verification at Community level of emissions from the trading sectors in the different Member States.

For any emissions trading system to work, adequate enforcement of the rules in relation to participating companies is a foremost necessity. Member States are clearly best placed to take enforcement action *vis-à-vis* companies that participate in the trading system.

A Community emissions trading regime should set minimum penalties to be applied by Member States to non-compliant companies. It would be important to avoid "gaming", whereby companies that operate in more than one Member State would trade allowances between sources in different Member States with a view to ensuring compliance in a Member State that has strict penalties rather than in another that only has a weak enforcement system. Such transfers could de-stabilise the prospects of a Member State complying with its total allowances under the trading regime. Ultimately, it could even endanger a Party's overall compliance with its international commitments under the Kyoto Protocol.

## **9.3. Compliance and enforcement *vis-à-vis* Member States**

Currently, the Community's role in assessing Member State compliance with their obligations under the Framework Convention on Climate Change and the Kyoto Protocol is based on the Monitoring Decision<sup>39</sup>, which provides for the emissions of greenhouse gases in Member States to be monitored at Community level on the basis of aggregate data per Member State. For a Community-wide emissions trading

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<sup>38</sup> Council Regulation (EEC) No 1836/93 of 29 June 1993 allowing voluntary participation by companies in the industrial sector in a Community eco-management and audit scheme.

<sup>39</sup> Council Decision 93/389/EEC of 24.06.1993 for a monitoring mechanism of Community CO<sub>2</sub> and other greenhouse gas emissions, amended by Council Decision 1999/296/EC of 26.04.1999.

scheme, the option of enforcement action against Member States would provide additional guarantees.

The EC Treaty<sup>40</sup> provides the right, even the obligation, for the Community to take action against a Member State when a case of non-compliance is identified, provided there is an adequate legal basis to do so (e.g. EC Regulation, Directive or Decision). In such a case, the Commission can start an infringement procedure against a Member State on its own initiative or on the basis of a complaint by an individual or a legal entity. A Member State can also bring a case against another Member State. If no satisfactory solution is found in the course of the procedure, the case will be submitted to the European Court of Justice to give its judgement.

In addition, since 1993 there is the possibility for the European Court of Justice to impose a penalty payment or fine on Member States that have failed to comply with a judgement of the Court<sup>41</sup>. This implies further procedures that take time. However, the existence of these financial penalties provides a strong deterrent effect, and in practice has functioned particularly well as an incentive to ensure compliance with environmental measures.

#### **9.4. Questions:**

*Question 9: Are the currently available instruments (Monitoring Mechanism, infringement procedures) sufficient or should additional tools be developed in order for the Community to adequately assess compliance in the context of emissions trading within the Community?*

*Question 10: Do the elements of compliance and enforcement mentioned above warrant co-ordination or harmonisation at Community level, and which elements are more appropriately undertaken by Member States?*

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<sup>40</sup> Articles 226 and 227 EC Treaty (old Articles 169 and 170).

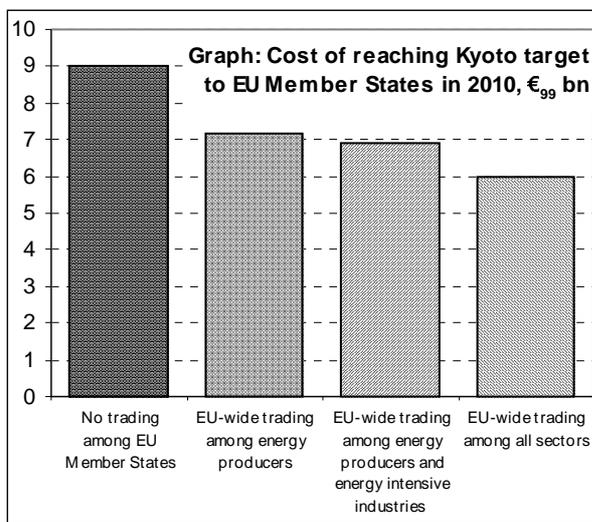
<sup>41</sup> Article 228 EC Treaty, as amended by the Treaty of Maastricht (old Article 171).

## Annex 1: Economic analysis

### **Empirical estimates of the reductions in cost to comply with the Kyoto Protocol**

The Commission services have analysed<sup>42</sup>, how economically important EU-wide trading would be if carried out in addition to emissions trading at the individual Member State level<sup>43</sup>. If each Member State implemented its specific target under the “burden sharing” agreement individually, the total annual cost for the EU to reach the Kyoto target could reach some €9.0bn<sup>44</sup> (Graph: see left column).

#### **1. Emissions trading among energy intensive sectors in the EU reduces compliance costs**



If the energy supply sector and energy intensive industries<sup>45</sup> participated in an EU-wide trading regime (Graph: see 3<sup>rd</sup> column from left) the annual cost to comply with the Kyoto Protocol would be €6.9bn in 2010. If only energy suppliers participated in the emissions trading scheme (Graph: see 2<sup>nd</sup> column from left), the annual compliance cost would be slightly higher, i.e. €7.2bn.

The price of emissions allowance would be in both cases about €33 per ton of carbon dioxide<sup>46</sup>, which is well within the range of €5 and €58 that have been estimated by other emission trading models<sup>47</sup>.

<sup>42</sup> The analysis has been carried with an EU-wide energy systems model called Primes. Source: E<sup>3</sup>M Lab, National Technical University of Athens (forthcoming): “The Economic Effects of EU-wide Industry-Level Emission Trading to Reduce Greenhouse Gases” (<http://europa.eu.int/comm/environment/enveco/studies2.htm>).

<sup>43</sup> The baseline is consistent with the Shared Analysis Project initiated by DG Energy (for details see <http://www.shared-analysis.fhg.de/>). However, this analysis takes fully into account the agreements made with the European, Japanese and Korean car manufacturers. These agreements are projected to reduce CO<sub>2</sub> emissions by 80Mt of CO<sub>2</sub>. This is 2.6% of the EU’s 1990 emissions.

<sup>44</sup> All prices in this Annex are at 1999 levels.

<sup>45</sup> Energy supply includes electricity generation, co-generation, refineries and large combustion boilers of industry. Energy intensive industries include iron and steel, non-ferrous metals, construction materials, chemicals as well as paper and pulp industries.

<sup>46</sup> It should be noted that the other sectors (agriculture, transport, households, services etc.) would have a higher cost of abatement of carbon dioxide.

<sup>47</sup> The price of allowances among Annex B countries has been estimated to be between €5 and €58 per ton of CO<sub>2</sub> based on the following models: 1) AIM, EPPA, G-Cubed, GTEM, MS-MRT, Oxford and SGM: *Energy Journal* (1999). The costs of the Kyoto Protocol: A Multi-Model Evaluation. Special Issue. 2) Green and WorldScan: OECD (1998) Economic Modelling of Climate Change. Report of an OECD Workshop. OECD Headquarters, 17-18 September, 1998 (<http://www.oecd.org/dev/news/environment/modelling.htm>). 3) Poles: Coherence (1999) “Kyoto protocol and emissions trading: potential cost savings and emission reductions” in Economic Evaluation of Quantitative Objectives for Climate Change (<http://europa.eu.int/comm/environment/enveco/studies2.htm>). 4) GEM-E3 World: Capros (1999) GEM-E3 Elite research project. Final report to the European Commission, DG Research. Primes, GEM-E3 and Poles models have been developed through the support of DG Research non-nuclear energy programme.

It needs to be emphasised that the analysis assumes that energy supplies and energy intensive industries already participate in national emissions trading schemes covering all sectors. Thus, most of the benefits from trading for industry would already have been exhausted at Member State level. This optimistic assumption is discussed further in Section 3 below.

In sum, EU-wide emissions trading in CO<sub>2</sub> among energy supply and energy intensive industries would save the EU almost €2bn per annum in 2010. These gains would represent an annual cost reduction of a fifth compared to not having emissions trading at EU level.

## **2. Emissions trading among all sectors in the EU further reduces compliance costs**

If all sectors (including also agriculture, transport, households, services etc.) participated in emissions trading in the EU, the annual compliance cost would reduce to €6.0bn in 2010 (Graph: see right column). Allowing Member States to trade emissions across all sectors would thus reduce the annual cost of compliance by €3.0bn. This represents 34% of the compliance cost for the EU. The price of emission allowances would be €32.5 per tonne of CO<sub>2</sub>. These results have been confirmed by additional analyses carried out for the Commission<sup>48</sup>.

## **3. In practice, gains from EU-wide emissions trading are likely to be greater**

Numbers used in this analysis are likely to underestimate the real impact of EU-wide emissions trading, because the models assume that the Member States are able to obtain a least-cost allocation of emission reduction effort to their sectors when they act individually. In other words, the models assume that all Member States are able to reduce their emissions by themselves in the most cost-effective manner for instance, by setting optimal carbon taxes or by carrying out full emissions trading within their borders. Such assumptions are not likely to hold in practice.

The Commission services have estimated what the compliance costs would be if Member States allocated their respective “burden sharing” targets uniformly to all sectors without any trading between sectors<sup>49</sup>. This analysis suggests that the annual compliance costs of EU Member States would be as much as €20bn a year.

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<sup>48</sup> Analyses carried out by the Institute for Prospective Technological Studies (IPTS) using the Poles world energy model and by Oxford Economic Forecasting using a macroeconomic model. According to the Poles energy model, emissions trading among all sectors in the EU would reduce compliance costs by 25% compared with a situation in which there was no trading between Member States. The price of emission allowances would be €49 per ton of CO<sub>2</sub>. These results confirm the estimated compliance cost reduction and price of emissions, given the differences between the Poles and Primes models. For instance, the Poles model has only four Member States (the rest are aggregated to two groupings) and more limited sectoral breakdown than the Primes model. Source: IPTS, DG Joint Research Centre, “Preliminary Analysis of the Implementation of an EU-Wide Permit System on CO<sub>2</sub> Emissions Abatement Costs Results from Poles model” (forthcoming). The Oxford macroeconomic model corroborates the results from Primes and Poles energy models. With EU-wide emissions trading among all sectors, the Oxford model estimates the loss of Gross Domestic Product to be reduced by up to 30%. Source: Oxford Economic Forecasting “Macro-economic analysis of EU-wide emissions trading” (forthcoming). (Studies will be made available on: <http://europa.eu.int/comm/environment/enveco/studies2.htm>).

<sup>49</sup> In this scenario, the “burden sharing” target of a Member States is applied across all sectors (so if the target was, for instance, –4%, this would be assumed to apply to all sectors). This is an estimate of the upper-limit of the cost of Member States not carrying out optimal climate change policies and gives an idea of the order of magnitude of the costs of sub-optimal policies.