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Marco Piovan

University of California, Santa Barbara

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THE EUROPEAN UNION EMISSION TRADING SCHEME

Marco Piovan

By ratifying the Kyoto Protocol, the European Union (EU) agreed to reduce emissions of greenhouse gases by 8 percent in the period 2008–2012, compared to 1990 levels. The main tool the EU has developed in order to meet such requirement is the Emission Trading Scheme (ETS). The EU ETS is a cap and trade system that affects more than 40 percent of the EU carbon dioxide emissions.

The purpose of this paper is to show how the European ETS has been developed and analyze its mechanisms. Following the initial proposal of the *Green Paper on Greenhouse Gas Emissions Trading* (2000), the EU ETS started operating in the year 2005. The outcome is the result of a bargaining process between national and EU institutions and businesses, with a leading role taken by the European Commission.

The paper will discuss the main issues pertaining to the EU ETS and will analyze its crucial role within the development of environmental policy in Europe.

INTRODUCTION

This paper proposition is to examine the nature, the structure, and the development of the European Union Emission Trading Scheme (EU ETS). The EU ETS allows a certain degree of freedom for Member States in operating the trading system, under the supervision of the European Commission (EC). The core of the system is a distribution of “rights to emit carbon dioxide”, which are called allowances, to selected activities across European countries.

The EU ETS is based on the recognition that, by creating a price for carbon through the establishment of a cap-and-trade system and its related market, it will foster the most cost-effective way for EU Member States to meet their Kyoto obligations and commit to European environmental-energy policies which move towards a low-carbon and energy efficient society in the future. The EU ETS is a simple and cost effective approach to emission reduction and is fully integrated in the single market logic of the EU because it establishes a single market for carbon allowances. In what follows, I will exemplify the structure of the system, describing the scheme development process and its framework, and give promi-

nence to its main features and I will also draw some conclusions on its efficacy.

1. HISTORY

The environmental policy of the European Union is quite new when compared to other policies. In fact, the Treaties of Rome in 1957 do not mention the environment at all. Later decades drew attention to a new imminent problem: climate change. In late 1973 the EU endorsed its first environmental action, the Environmental Action Program, to offset possible national policies to become barriers on building the common market and to foster the environment as the basis of economic and social development.¹ The first comprehensive and detailed Treaty, which addresses environmental policy, was the Single European Act in 1986. The EU was given responsibility over new areas such as the environment, and it made environmental protection a required component of all EU policies. The environment section of the Treaty calls for the Community to take actions relating to the environment to the extent to which objectives like improving its quality, protecting human health, and rational utilization of natural resources can be attained better at Community rather than national level. This is without jeopardizing the Member States' competence to negotiate in international bodies and to conclude international agreements. Moreover, in considering actions, *"the environmental damage should as a priority be rectified at source, and that the polluter should pay"*. The concept of sustainability will be included later in the Maastricht (1992) and Amsterdam (1997) Treaties.

In this context and in urging actions on contrasting climate change, the Joint Energy Environment Council (1990) proposed to stabilize EU-15 carbon dioxide (CO₂) emissions at 1990 levels by 2000.² A first proposal about a CO₂ tax was drafted in 1992; although it was withdrawn five years later. Despite this failure, the same year was the inception of a global commitment on climate change: The United Nations Organization under the Framework Convention on Climate Change (UNFCCC) involved 160 parties endorsing to adopt global agreements on climate issues. The Convention is composed of the Conference of the Parties (COP) which includes all the countries that are Parties to the Convention. The third COP adopted the Kyoto Protocol in the year 1997, which became the most important document ever drafted on climate change. Its implications, both political and technical, have been tremendous in the past decade and are still the baseline for future negotiations.

The Kyoto Protocol includes more binding requirements for the Countries listed in the Annex I (industrialized countries), which the EU is part of. Art. 11 states that those countries must assist and provide financial and technological resources to developing countries, in order to help them advance with the implementation of existing commitments. The Protocol intends to promote such a harmonious development through three flexible mechanisms.³

- First, the Protocol allows emission trading as a way of generating tradable carbon credits: a cap and trade system. Art. 17 defines the emission trading and it is the system by which the developed countries acquire emission units from other developed countries.
- Second, the Joint Implementation (JI) as defined in the Art. 6 of the Protocol allows countries under Kyoto commitments to take part in the emissions reduction project in other countries which are under Kyoto commitments too. An Annex I country is allowed to finance a project in another Annex I country obtaining

- reductions units disposable to comply with its Protocol requirements.
- Third, the Clean Development Mechanism (CDM) gives a tool to help Annex I parties achieving compliance with their stricter commitments and let developing countries be assisted from project resulting in certified emissions reduction. An Annex I country is allowed to finance a project in a non Annex I country which ratified the Protocol, obtaining reductions units disposable to comply with its Protocol requirements.

The Kyoto Protocol is the milestone of the development of the European Union Emission Trade Scheme. The European Union has been the greatest supporter of the Protocol and has been developing a series of agreements and actions in order to comply with its requirements. These actions occurred in part before the EU ratified the Kyoto Protocol in the year 2002. After the adoption of the third COP, the EU decided to reallocate the emission reductions quotas of each Member State under the Burden Sharing agreement (BSA) in the year 1998. The BSA was reaffirmed by joint ratification of the Kyoto Protocol in 2002, where it became a binding international law. The BSA was made considering cost efficiency and equity as baseline of its settlements. This led to very different quotas among the EU member states: more stringent targets were assigned to Germany and UK while some countries were even allowed to increase their emissions.⁴

Later in the year 2000 the EU launched the European Climate Change Programme (ECCP). The goal of the ECCP is to identify and develop all necessary elements of an EU strategy to implement the Kyoto Protocol. The development of the first ECCP involved all of the relevant groups of stakeholders working together, including representatives from the Commission's different departments (DGs), the Member States, industry and environmental groups. The second ECCP started in the year 2005 and focused on several working groups, one of which was dedicated to a review of the ETS.

The idea of developing an emission trading system to comply with the Kyoto commitments came with the *Green Paper on GHG Emission Trading* (2000). The inception of the EU ETS took place although the EU was formerly strongly opposed to emission trading during the international negotiation in Kyoto.⁵ The EU ETS is a result of the Kyoto Protocol. However it is implemented through European laws independently of it. Its function is also to facilitate other actions like self-commitments of the EU: the 20-20-20 pact, which sets targets on energy and -20 percent CO₂ emissions (1990 baseline) within the year 2020 among the European Community, is based on EU ETS. The ETS has already experimented its first Phase and it is now running the second, the one under the Kyoto commitments. Its role as the biggest worldwide tool on CO₂ emissions reduction is going to influence future negotiations on the post Kyoto actions which are set to be accomplished in the Copenhagen COP later in 2009.

2. DRIVERS

There are several features which characterize the EU ETS and make it a particular case of emission trading. The current framework is the outcome of political, institutional, and private pressures and bargaining. It is difficult to understand the exact dynamic driving each feature, but it is possible to show which are the principles that support the EU ETS.

First of all the EU ETS is an "add on" system and is therefore compatible with what most European countries used to commit to the Kyoto Protocol. Each Member State shall

communicate to the European Commission (EC) the amount of CO₂ equivalent emissions reduction coming from internal policies other than the EU ETS. This is a favorable feature to governments and their actions because they have control over their industries. Another important feature is that an emission trading is a system that does not undermine the environmental objective, since the overall amount of allowances is fixed (i.e. the total EU ETS CO₂ emissions cap is ultimately decided by the EC). Rather, it enables cost-effective implementation of the overall target and provides incentives to invest in environmentally sound technologies. This makes a ETS a safe way to comply with the Kyoto commitments.

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. Furthermore, emissions trading induces competition between companies to find cost-effective ways to reduce their emissions, and additional boost is given to environmentally friendly technologies.⁶ The intention is to ensure that the EU ETS results in reductions in emissions which are additional to those that are already provided for by Community legislation on renewable energy in electricity production.⁷

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 is one example and the former successful experience deriving from the US with sulphur dioxide emissions trading is another one.⁸

The EU ETS is implemented at the European level: it is a common system to the 27 EU Member States. A political driver to the realization of a common EU members ETS is the group of European Institutions. In fact the EU is not only a group of countries participating in a set framework, it is also a supranational institution with its own offices and jurisdiction over some issues. Consequently one point of view about the EU ETS boost comes from the proper EU institutions. Since the Treaties of Rome there has been a calling for a common market as a basilar step towards integration. It's not surprising that the EU institutions are encouraging a resolution at an EU level of the Kyoto commitment.

The EU has a particular character, still not fully accountable to citizens and so to their opinion or consensus, but strongly structured and made out of technical groups. This helped the EU ETS to be fostered, since it met many efficiency requirements, compatible with the idea of a common market and increasing integration. The Green Paper on GHG Emission Trading highlights these facts mentioning many features that a ETS at the European level might be the best way to comply with the Kyoto Protocol. *"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."*⁹ Moreover, companies which operate in a free European market, would have had many constraints if the ETS had been developed separately in individual countries rather than at the European level.

The free market has made business easily implemented at European level so that many companies operate nowadays in different EU Member States; when companies were operating within national borders some decades ago. Therefore it's likely that companies preferred a EU-wide ETS to 27 individual ETS. A Community emissions trading scheme leads 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 and

consequently to a distortion of the European market.

Activities which account for the major share of the EU ETS are those related to energy, and therefore power plants are playing a central role. The electricity sector has been historically nationalized, but in the past 20 years there has been a progressive liberalization of the sector. This is the consequence of both a political pressure at the European level in order to comply with a common free market and a technical choice to foster energy efficiency. In fact, nationalization has helped to build a solid power plant and electrical system framework but has not been able to maximize efficiency as the liberalization of the market is likely to do. Consequently, the energy sector has been developing knowledge and attitude to work in a market regime. The EU ETS comes as the main sector involved in it and has already developed tools to tackle a market regime. This is likely to be a prevailing reason why the EU ETS has been endorsed.

Guarantees of competitiveness, pooling commitment, and a pilot phase have been addressed in the EU ETS to respond to critical business issues. This is linked to a national role of allocation management, favorable to both individual governments for the critical importance on being responsible for the allocation process, and business which has more possibility to condition a national level allowances distribution.

Finally The inclusion of JI and above all of CDM credits in the EU ETS were fostered by activities involved in the ETS since they represent an opportunity to obtain cheaper credits from projects. The European Commission must verify these credits in order to add-on to national credits. Businesses' social responsibility and environmental performance play a strategic role in the development of flexible mechanisms. The Linking Directive states:

"since participation in JI and CDM project activities is voluntary, corporate environmental and social responsibility and accountability should be enhanced in accordance with paragraph 17 of the Plan of implementation of the world summit on sustainable development ."

3. THE LEGAL AND INSTITUTIONAL FRAMEWORK^{9, 10}

The Emissions Trading Directive is the charter that provides the legal foundation for the EU ETS. The European Commission first published a draft proposal in October 2001, which was formally enacted in October 2003; the *Green Paper on GHG Emission Trading*. Since it was drafted there has been much discussion over the development of the EU ETS. The two years that separate the first proposal from the definitive endorsement were characterized by changeovers between the European Parliament and Council. Amendments in the two years between the formal draft proposal and its final enactment were added as reported in the documents available at the EC environment DG. The release of the proposed EU Directive on GHG emissions trading in October 2001 initiated the co-decision process, whereby the European Parliament and the European Council would share together the institutional power they hold. The first reading of the proposal took place in the European Parliament in October 2002 and it led to an amended proposal from the Commission in November 2002. In March 2003, the Council of the European Union adopted a common position on the directive. The Commission supported the Common Position adopted on March 18, 2003. The subsequent agreement between the Parliament and the Council led to final adoption of the proposal by the Council on July 22, 2003 and promulgation as Directive 2003/87/EC on October 13, 2003.

As the Kyoto Protocol provides, the flexible mechanisms play an important role on the

acceptance of the EU ETS. The Commission responded to this need by the adoption of a specific provision linking Joint Implementation and Clean Development Mechanism credits to the EU ETS. It issued the proposal as the "Linking Directive" (European Commission 2003) on July 23, 2003. The Linking Directive went into force as Directive 2004/101/EC on November 13, 2004. Member States had to bring into force the laws, regulations, and administrative provisions necessary to comply with the Linking Directive by November 13, 2005.

4. HOW IT WORKS¹¹

The EU ETS is a 'cap and trade' system. The overall cap on emissions is fixed and divided among its participants. The system provides the possibility for the existence of market platforms in order to facilitate trade among participants. Every participant has to comply with its emissions cap (i.e. the requirement on its total CO₂ emissions), which is represented by assigned allowances on emissions. One allowance gives the holder the right to emit one tonne of CO₂. These allowances are the common trading 'currency' at the heart of the system: participants are allowed to trade off their allowances as long as they respect their cap. Allowances are central to the EU ETS as they are the measure of the emissions, and its number is one of the key determinants of the price in the market.

The system was originally divided into two phases. The first one, known as pilot phase, took place between 2005–2007. The second is now in place and follows the Kyoto 2008–2012 time period. Currently, every Member State shall present to the European Commission, for each trading period under the scheme, a national allocation plan (NAP). This document determines total levels of ETS emissions and how many emission allowances each installation within the country receives each year. At the end of each year installations must surrender allowances equivalent to their emissions. Companies that keep their emissions below the level of their allowances are in a long position and can sell the surplus of allowances. Those which are emitting more than allowed are in a short position and can buy allowances on the market. The choice of recurring to the market rather than to investing in self-compliance are likely to be determined by relative costs. In fact, the ultimate goal of the EU ETS is to reach reductions in the most cost effective way. Commission studies have concluded that the targets can be achieved at an annual cost of €2.9 to €3.7 billion, which is less than 0.1 % of GDP of the EU. One of these studies concluded that without the Emissions Trading Scheme costs could reach €6.8 billion. Emission trading thus allows the costs of Kyoto to be reduced.

5. PARTICIPANTS AND CAPS

Today the EU ETS includes the participation of all the EU-27 Member States (Romania and Bulgaria joined in 2007) as well as Iceland, Liechtenstein, and Norway (2008) which are not EU members. The Directive 2003/87/EC enacted the EU ETS, specifying the sectors involved in the cap and trade system. Annex I of the directive exemplifies the activities involved which are reported in the Table 1.1. Some more activities, which are not included in Table 1.1, were added with the beginning of second phase.

Table 1.1 Categories of Activities under the EU ETS

| Activities | Greenhouse Gases |
|--|------------------|
| <i>Energy activities</i> | |
| Combustion installations with a rated thermal input exceeding 20 MW (except hazardous or municipal waste installations) | Carbon dioxide |
| Mineral oil refineries | Carbon dioxide |
| Coke ovens | Carbon dioxide |
| <i>Production and processing of ferrous metals</i> | |
| Metal ore (including sulphide ore) roasting or sintering installations | Carbon dioxide |
| Installations for the production of pig iron or steel (primary or secondary fusion) including continuous casting, with a capacity exceeding 2.5 tonnes per hour | Carbon dioxide |
| <i>Mineral industry</i> | |
| Installations for the production of cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day or lime in rotary kilns with a production capacity exceeding 50 tonnes per day or in other furnaces with a production capacity exceeding 50 tonnes per day | Carbon dioxide |
| Installations for the manufacture of glass including glass fibre with a melting capacity exceeding 20 tonnes per day | Carbon dioxide |
| Installations for the manufacture of ceramic products by firing, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware or porcelain, with a production capacity exceeding 75 tonnes per day, and/or with a kiln capacity exceeding 4 m ³ and with a setting density per kiln exceeding 300 kg/m ³ | Carbon dioxide |
| <i>Other activities</i> | |
| Industrial plants for the production of | Carbon dioxide |
| (a) pulp from timber or other fibrous materials | |
| (b) paper and board with a production capacity exceeding 20 tonnes per day | Carbon dioxide |

Source: Directive 2003/87/EC

Table 1.1 clearly shows how the EU ETS targets those activities which result in massive emissions. This is the fundamental criteria on whether to assign compliance requirements to companies or not. The point regarding energy activities includes electricity and heating production. These are the bulk of the EU ETS since they are carbon intensive emitters and installations bigger than 20 MW cover a very large share of European electricity and heating production. Other activities in Table 1.1, such as production of metals, are very intensive emitters for the particular manufacturing process. Other industries, such as cement factories, result in large emissions for their chemicals. The participation is ultimately defined at European level by the EC Directive 2003/87, but some exceptions are allowed: in particular cases, some activities under the EU ETS could not be constrained to any requirement even though they are part of the activities listed in Table 1.1.

Transportation as well as residential-household, resulting in diluted emissions, is completely neglected despite the fact that emissions coming from transportation are not negligible at all. In the EU, transport is responsible for 21 percent of EU greenhouse gas emissions, households and small businesses for 17 percent and agriculture for 10 percent.

The other fundamental point is the cap. The overall EU cap about GHGs emission reductions is equal to the EU commitment under the Kyoto Protocol. The EU ETS cap is a “cap within the cap”, assigned to the trading sector considering the 2008-2012 phase.¹² In fact the Kyoto commitments are not fully under the EU ETS but also under the non-trading sectors which every member state must exemplify in its national reports (National Allocation Plans).

Another important issue is how many allowances are distributed among the activities: the criteria here is based on the abatement possibilities of each activity included. The outcome is that the energy sector accounts for the main share of emissions reductions. Under the EU ETS, about 11,500 energy-intensive plants across the EU-27 are today able to buy and sell permits to emit carbon dioxide, representing around 45 percent of the EU's total CO₂ emissions (or about 30 percent of its overall GHG emissions).¹³

This point, the distribution among activities, reveals a particularity of the EU ETS. The overall cap is defined by the Commission which retains ultimately the power to accept the distribution of allowances. However, the distribution is left to the Member States: each one has the responsibility to allocate allowances among national activities. This dualism is a particular feature of the EU ETS when compared to other emission trading systems. The Commission's decisions on the national allocation plans for the Phase II amounted to 2083 million tonnes per year following the decision of the Court on the Slovak plan, which definitively set the Slovakia Phase II cap. Table 1.2 shows the total amount of allocation in the National Allocation Plans (NAPs). Each Member States was assigned a specific emissions cap both in Phase I and II. All of the Phase II caps resulted stricter than those of Phase I, and almost all of the cap that Member States proposed for Phase II were modified by the Commission towards bigger stringency (except Denmark, France, Slovenia, and UK's proposed cap). Different amounts of JI/CDM credits use were allowed throughout EU Member States, as they were implemented within the EU ETS starting from Phase II. In fact, after that the EU ETS was endorsed by the Directive 2003/87/EC; it was subsequently amended by the Directive 2004/101/EC (known as the Linking Directive) which adopted legislation regulating the admission of CDM credits.

Table 1.2 Data of National Allocating Plans (emissions in Mt)

| Member State | 1st period cap (2005-2007) | 2005 verified emissions | Proposed cap 2008-2012 | Cap allowed 2008-2012 (in relation to proposed) | Emissions from addt'l installations in 2008-2012 ¹ | JJ/CDM limit 2008-2012 in % ² |
|-----------------|----------------------------|-----------------------------|------------------------|---|---|--|
| Austria | 33.0 | 33.4 | 32.8 | 30.7 (90.6%) | 0.35 | 10 |
| Belgium | 62.1 | 55.58 ³ | 63.3 | 58.5 (92.4%) | 5.0 | 8.4 |
| Bulgaria | 42.3 | 40.6 ⁴ | 67.6 | 42.3 (62.6%) | n.a | 12.55 |
| Cyprus | 5.7 | 5.1 | 7.12 | 5.48 (77%) | n.a | 10 |
| Czech Rep. | 97.6 | 82.5 | 101.9 | 86.8 (85.2%) | n.a | 10 |
| Denmark | 33.5 | 26.5 | 24.5 | 24.5 (100%) | 0 | 17.01 |
| Estonia | 19 | 12.62 | 24.38 | 12.72 (52.2%) | 0.31 | 0 |
| Finland | 45.5 | 33.1 | 39.6 | 37.6 (94.8%) | 0.4 | 10 |
| France | 156.5 | 131.3 | 132.8 | 132.8 (100%) | 5.1 | 13.5 |
| Germany | 499 | 474 | 482 | 453.1 (94%) | 11.0 | 20 ⁵ |
| Greece | 74.4 | 71.3 | 75.5 | 69.1 (91.5%) | n.a | 9 |
| Hungary | 31.3 | 26.0 | 30.7 | 26.9 (87.6%) | 1.43 | 10 |
| Ireland | 22.3 | 22.4 | 22.6 | 22.3 (98.6%) | n.a | 10 |
| Italy | 223.1 | 225.5 | 209 | 195.8 (93.7%) | n.k. ⁶ | 14.99 |
| Latvia | 4.6 | 2.9 | 7.7 | 3.43 (44.5%) | n.a | 10 |
| Lithuania | 12.3 | 6.6 | 16.6 | 8.8 (53%) | 0.05 | 20 |
| Luxembourg | 3.4 | 2.6 | 3.95 | 2.5 (63%) | n.a | 10 |
| Malta | 2.9 | 1.98 | 2.96 | 2.1 (71%) | n.a | Tbd |
| Netherlands | 95.3 | 80.35 | 90.4 | 85.8 (94.9%) | 4.0 | 10 |
| Poland | 239.1 | 203.1 | 284.6 | 208.5 (73.3%) | 6.3 | 10 |
| Portugal | 38.9 | 36.4 | 35.9 | 34.8 (96.9%) | 0.77 | 10 |
| Romania | 74.8 | 70.8 ⁷ | 95.7 | 75.9 (79.3%) | n.a | 10 |
| Slovakia | 30.5 | 25.2 | 41.3 | 32.6 (78.9%) | 1.78 | 7 |
| Slovenia | 8.8 | 8.7 | 8.3 | 8.3 (100%) | n.a | 15.76 |
| Spain | 174.4 | 182.9 | 152.7 | 152.3 (99.7%) | 9.56.7 ⁸ | ca. 20 |
| Sweden | 22.9 | 19.3 | 25.2 | 22.8 (90.5%) | 2.0 | 10 |
| UK | 245.3 | 242.4 ⁹ | 246.2 | 246.2 (100%) | 9.5 | 8 |
| SUM | 2298.5 | 2122.16¹⁰ | 2325.34 | 2082.68 (89.56%) | 54.69 | - |

Source: European Commission

1. The figures indicated in this column comprise emissions in installations that come under the coverage of the scheme in 2008 to 2012 due to an extended scope applied by the member state and do not include new installations entering the scheme in sectors already covered in the first trading period.

2. The JI/CDM limit is expressed as a percentage of the member state's cap and indicates the maximum extent to which companies may surrender Joint Implementation (JI) or Clean Development Mechanism (CDM) credits instead of EU ETS allowances to cover their emissions. These JI and CDM credits are generated by emission-saving projects carried out in third countries under the Kyoto Protocol's project-based flexible mechanisms.
3. Including installations that Belgium opted to exclude temporarily from the scheme in 2005.
4. Due to Bulgaria's recent accession to the EU, this figure is not independently verified.
5. The German national allocation law contains a figure of 22%, which relates to the allowances allocated free of charge, rather than the total cap.
6. Italy has to include further installations. The amount of additional emissions is not known at this stage.
7. Due to Romania's recent accession to the EU, this figure is not independently verified.
8. Additional installations and emissions of over six million tonnes are already included as of 2006.
9. Verified emissions for 2005 do not include installations which the U.K. opted to exclude temporarily from the scheme in 2005 but which will be covered in 2008 to 2012 and are estimated to amount to some 30 million tonnes.
10. The sum of verified emissions for 2005 does not include installations which the U.K. opted to exclude temporarily from the scheme in 2005 but which will be covered in 2008 to 2012 and are estimated to amount to some 30 million tonnes. Furthermore, the emissions figures for Bulgaria and Romania are not independently verified.

6. TIME PERIODS STRUCTURE

The EU ETS was first created to help EU Member States to commit to the Kyoto Protocol. It is therefore reasonable that a EU ETS Phase coincides with Kyoto Protocol committing period. The existence of a pilot Phase to prepare the EU Member States to the main Phase was included in the Directive 2003/87/EC. For each phase Member States had to draft a NAP: the existence of NAP I and NAP II respectively refer to Phase I (the Pilot Phase) which ran between 2005 and 2007, and Phase II between 2008 and 2012. The structure of the Phases in terms of obligations and prescription of regulations is the same, except for some details (e.g. penalties: 40 Euro for each not returned allowance under the first phase, 100 Euro under the second). More activities were compelled to comply with the EU ETS: among these are Glass, Mineral Wool, Gypsum, Petrochemicals (crackers), Carbon Black, Integrated Steelworks, Flaring from offshore oil and gas production. Moreover, the Linking Directive added a new criterion. This requires each plan to state how many credits from JI and CDM projects, those plants covered by the allocation plan, are permitted to surrender for compliance in the second trading period.

CO₂ emissions of the activities under the EU ETS have risen by 1.9 percent within the Phase I, well below the EU GDP growth.¹⁴ For the second trading period the Commission has capped national emissions from EU ETS sectors at an average of around 6.5 percent below 2005 levels to help ensure that the EU as a whole, and Member States individually, deliver on their Kyoto commitments. To do that operators are globally allowed to import up to 1,932 million credits during Phase II. In a preliminary but detailed analysis of this data, Ellerman and Buchner (2008) concluded that a reasonable estimate of the reduction in CO₂

emissions attributable to the EU ETS lies between 50 and 100 million tons for each year, or between 2.5 percent and 5 percent from what emissions would have been without the EU ETS. This is an important reduction, considering that environmental policies have never produced such a reduction before.

More discussion is taking place about the next Phase. In fact the EU ETS is going to be the tool to commit with the European developed 20–20–20 pact. The revision of the EU ETS was negotiated by the Union's heads of state and government in Brussels on December 11, 2008, and the European Parliament approved the new regime at first reading on December 17. The main elements of the new system, which will enter into force in 2013 and run until 2020 are many: capping total EU industrial emissions at 21 percent below 2005 levels by 2020 (i.e. a maximum of 1720 million allowances), the EU-wide target replaces the current 27 national targets, enlarging the scope of the scheme to new sectors so that around 50 percent of all EU emissions would be covered, auctioning as early as 2013, around 60 percent of the total number of allowances.

7. NATIONAL ALLOCATION PLANS^{15,16}

The National Allocation Plans are the core elements of the EU ETS. Each Member State must draft its own NAP as required by the EC. After taking into consideration the assigned cap and the activities established by the Directive 2003/87/EC, national governments must distribute the allowances on emissions. This means that for each trading period each Member State must decide in advance how many allowances to allocate in total and how many allowances each plant covered by the scheme will receive individually. This process highlights the decentralized nature of the EU ETS which consists of the work of national apparatus and institutions under the regulation and ultimate decision of the EC.

Each nation has developed registries and has given authority to its state apparatus in order to achieve a complete framework which would follow the regulations created by the NAP. Actually, Member States are periodically required to draw up their NAP well in advance of each ETS trading period and to have it approved by the European Commission.

Each Member State had to prepare and publish a first NAP for the 2005–2007 trading period by March 31, 2004 (May 1, 2004 for the 10 new Member States). NAPs for the second ETS trading period had to be submitted to the Commission by June 30, 2006. Deadlines need to be respected so that the Commission makes decisions on all the NAPs and Member States can take their final allocation decisions well before the trading period starts. Consequently, the Commission must make a decision on each NAP within three months of the NAP having been notified to it.

Member States have two options on how to distribute allowances: free of charge or by auctioning. Article 10 of the Directive 2003/87/EC stipulates that for the first and second trading period Member States must allocate at least 95 percent respectively 90 percent of the allowances free of charge. During the first trading period, Member States auctioned only very limited quantities of allowances. For the second trading period, still the lion's share of allowances has been allocated for free, although somewhat more significant quantities have been auctioned. The next phase, starting in 2013, is going to mark a turning point since the Commission states that auctioning of allowances is going to be the rule rather than the exception.

The process of endorsement of the NAPs exemplifies the ultimate decisional power of the Commission. If the Commission does not reject any aspect of a NAP, the Member State

can make a final decision on the allocation to individual installations. If the Commission finds that a NAP is not in line with the agreed criteria or with the EU Treaty it can reject it partially or in full. A rejection of a national allocation plan means that the Member State may not proceed in implementing the plan as it stands (i.e. may not allocate the number of proposed allowances). The Commission must give its reasons for rejecting a NAP, and these reasons give guidance on how Member States can make the plan compatible with the allocation criteria.

If Member States whose plans have been partially rejected implement the proposed changes they do not have to submit their plans to the Commission a second time but can proceed in taking their final allocation decision. After receiving the Commission's approval a Member State has to proceed to make a final allocation decision at the national level. Before doing so, it can make changes to the number of allowances for individual plants as a result of improved data, (e.g. if historic emissions data are used for a plant-level allocation formula, or to increase the percentage of allowances that it will auction).

Once the final allocation decision has been made at the national level and the final plan is published, no more changes (known as "ex-post adjustments") to the number of allowances in total or per plant can be made in the national allocation plan. In fact, 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 and ex-post adjustments are incompatible with the legal framework because they represent interventions that disrupt the market and create uncertainty for companies. For example, if a company faces the possibility that the government may take away allowances after it has reduced its emissions, it will hesitate to do so.

7.1 DISTRIBUTION OF ALLOWANCES

Article 11(4) of the Directive 2003/87/EC does not specify the proportion of allowances which Member States are to issue each year. In fact, Member States should have the flexibility to issue higher proportion of allowances in the first years of the period if they so wish. Annual issuing, in conjunction with annual surrendering, should ensure that operators keep a good understanding of their emissions trajectory. This would avoid the occurrence of price spikes at the end of the 3 or 5 years period. The quantity of allowances a Member State may issue is governed by the 11 Criteria specified in the Annex III of the Directive 2003/87/EC. Among these are: meeting the EU's and Member States' Kyoto commitments, actual verified emissions reported in the Commission's annual progress reports, and the technological potential for reducing emissions. The Emissions Trading Directive does not explicitly prescribe a given number of allowances, but each Member State must respect the criteria. The way by which allowances are allocated is a kind of reiteration between government and industries considering the data provided by the latter.

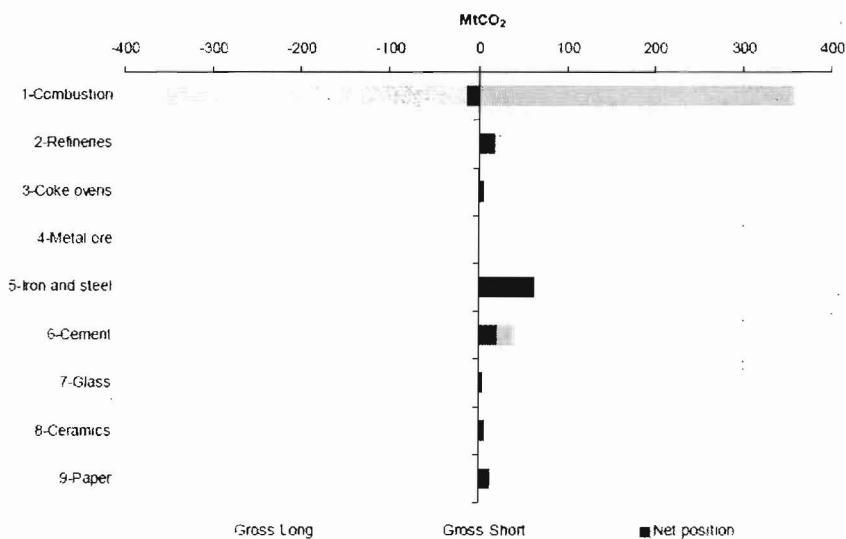
An amendment to the ETS Directive (i.e. the Linking Directive), allows companies in the second trading period to use credits from JI and the CDM, up to a certain proportion of their allocation of emission allowances in order to cover their emissions. The degree of use must be supplemental to reductions achieved through domestic policy action. It also needs to be fixed by each Member State in its NAP by specifying the maximum amount of such credits. Member States are free to choose whether to apply the limit individually in respect to each installation, or collectively to all installations. For greater flexibility, the Commission is recommending that Member States apply the limit for the entire trading period and

collectively to all installations.

It is interesting to note that, although the eastern European Member States are included in the Annex I countries of the Convention (UNFCCC), they don't need particular measures in order to commit to any Kyoto requirements. In fact, their actual emissions are much lower than in 1990, since emissions decreased in the first half of the 1990s due to the economic restructuring in Eastern Europe. The possibility of distortions in the EU ETS market when eastern Member States were allowed to distribute free amounts of allowances is a major issue. In order to avoid this, the EC set a cap in their NAPs considering the business as usual expectation on those countries.

The outcome of allowances distribution in the first phase, as shown in the Figure 1.1, is that the electricity utility sector assumed a net short position when the other industrial activities were net long. In addition, Figure 1.1 highlights how the market volume was concentrated within the energy sector. The allowances distribution created both a long and short gross position across the various European installations, whose final trade off outcome was a energy sector net short position. All of the other industrial activities under the EU ETS resulted in a net long position.

Figure 1.1 Sectors allowances position



Source: CITL, 2007

7.2 ALLOWANCES TRADE OFF

Each Member State must arrange administrative arrangement and issue authority(ies) to comply with the Directive 2003/87/EC. Among these, arrangements on the issue of registers sets an accurate accounting of the holding, transfer and cancellation of allowances. This registry system is separate from trading activity since not all trades result in changes in ownership of allowances. However, where a trade culminates in a change in ownership, a transfer of allowances between accounts in the registry system is made. Both the government, by the appointed authority, and each person who detains allowances shall keep

track of holding, transfer, and cancellation in compliance with the Directive 2003/87/EC. Although any third party can buy and sell allowances, they first need to open an account anywhere in an EC registry. By creating an electronic database, the Commission ensures that there are no transfers incompatible with obligations resulting from the Kyoto Protocol. To do this the Commission designated a Central Administrator to maintain an independent transaction log recording the issue, transfer, and cancellation of allowances and checking the registers of each Member State.⁷ The outcome is a connection of all the national registers under the Community Independent Transaction Log (CITL) which provides allocation and emissions data at the installation level. Moreover, a recent achievement sees the connection of the CITL and Member State registries with the UNFCCC International Transaction Log (ITL), been completed on October 16, 2008.¹⁷

The Directive 2003/87/EC does not mention the establishment of any marketplaces. The legal framework of the trading scheme does not regulate how and where the market in allowances takes place. Companies with commitments may trade allowances directly with each other, or they may buy or sell via a broker, bank or other market intermediary. The existence of stock markets is therefore the outcome of the willingness of some participants of the EU ETS. For example, in the wake of electricity markets, energy market managers launched, in 2005, six marketplaces, contributing to the transparency and liquidity of the market. In 2007, organized marketplaces facilitated more than 70 percent of allowance transactions, a steady growth from approximately 40 percent in 2005.⁸

There are several kinds of contracts used to trade off allowances: the Over The Counter (OTC) ones accounted for an average of 57 percent in Phase I. The EU ETS grew over the course of 2007, with a traded volume of 1.6 Gt and a value of €28 billion. This represents a volume growth of 62 percent and a value growth of 55 percent from 2006. The EU ETS was still by far the largest carbon market worldwide in 2007, with 62 percent of the physical market and 70 percent of the financial market.¹⁸

8. EU ETS NEW ENTRANTS – CLOSURES¹⁹

The provisions about new entrants and possible closures are another distinguishing mark of the EU ETS comparing to other trading schemes. Their accomplishment is the offshoot of political pressure of the governments towards the EC to safeguard industry investments and maintaining plants within the nation. The outcome is usually a free allowance distribution to new entrants and withdrawal of allowances from any facility that shuts down.

The first phase saw a reservation on allowance to new entrants of 195 tons on emissions, that is equal to about 3 percent of the total. The distribution of these has been regulated mostly on a “first come first served basis” principle. In the case that more allowances are needed to satisfy a massive presence of new entrants, every government has a certain degree of freedom. Some governments, such as Italy and Germany, stated to buy on the market the needed allowance for the new entrants. Also, in the case that the reserve is not fully used, governments are allowed to choose whether to annul the remaining or not. The quantity of allowance is susceptible to government decisions too: in fact the best practice is to consider the best technology in use in order to assess the new entrants allowances endowment.

At the same time closure provisions permit the EU Member States some degree of freedom. Closures that occur during a phase allow the activity owner to retain the allowance until the end of the phase when the government authorizes it. Also, as in the case of Germany, there could be a transfer of allowances between closing activities and new entrants to

foster the establishment of industries within the country.

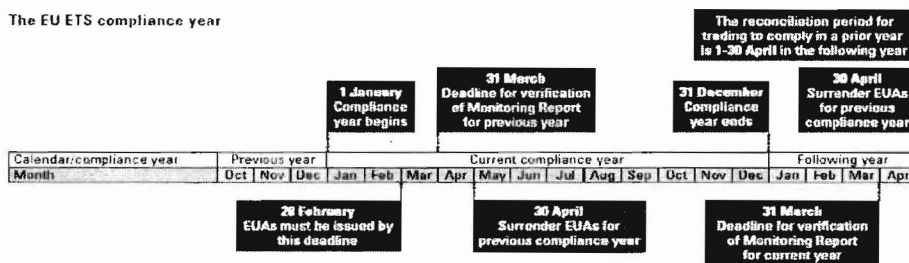
9. MONITORING, REPORTING, VERIFYING^{6, 13}

Every working system needs to be reviewed to ensure its operation and provide credibility. Monitoring, reporting, and verifying are essential mechanisms and hold particular attention during the operation of the EU ETS. Their development gives options flexibility to both installation and Member States. The guidelines are defined in the annexes IV and V of the Directive 2003/87/EC and focus on the baselines to measuring, the provision for reporting, and the requirements for verifying. Member States are responsible for all the three actions. The EC is like a unbiased superintendent: as well as within other parts of the EU ETS framework, its role is to ultimately ensure that Member States apply the regulations correctly.

In the monitoring process, the role of Member States is to ensure that the operators of certain specified activities hold a greenhouse gas emissions permit and that they monitor and report their emissions of greenhouse gases specified in relation to those activities. The guidelines on monitoring are based on the fuel use, and calculated using the formula "*Activity data* \times *Emission factor* \times *Oxidation factor*" whereas activity data take account of the kind of fuel used (nowadays, oxidation factor is still not considered, since the EU ETS covers only CO₂ emissions).

Member States have to respect several deadlines. The end of April is set to be the deadline to surrender the former year allowances as shown in Figure 1.2. Member States have to issue allowances by the end of February each year in accordance with the final allocation decisions, operate the national registry, and also have to produce a regular annual report to the Commission. The Commission established to adopt standardized or accepted methods as guidelines for monitoring and reporting of emissions. Moreover, Member States must take measures to coordinate reporting requirements with any existing reporting requirements in order to minimize the reporting burden on businesses.

Figure 1.2 EU ETS deadlines



Source: P. Zakkour, 2005

The aim of the verification process is to address the reliability, credibility, and accuracy of monitoring systems and the reported data and information relating to emissions. Member States are responsible to ensure the verification following the annex V provisions and to stop allowance transfers from those activities which do not meet the requirements of annex V. Member States are free to choose a third party in order to verify the monitoring and reporting according to the requirement of competency settled in the annex V.

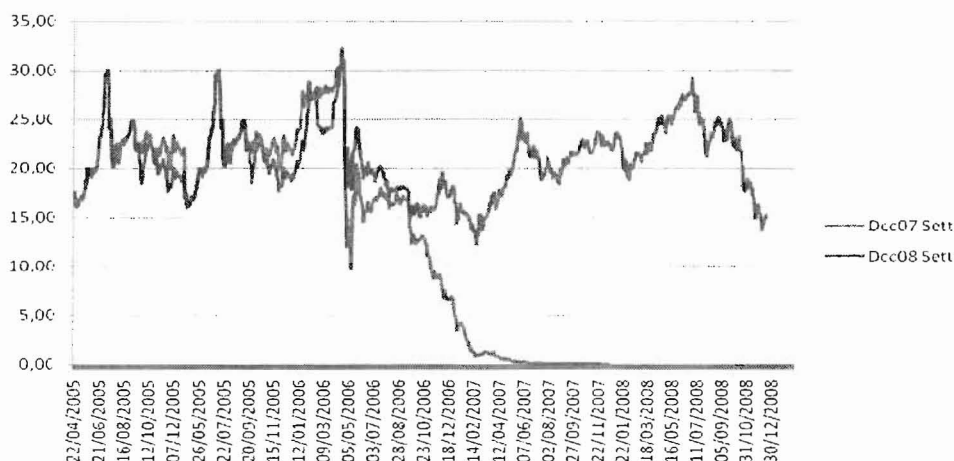
The Commission operates the European hub of the registry system, and prepares an annual report on the basis of Member States reports. It closely follows the performance of, and reviews the experience with, the EU Emissions Trading Scheme. The Commission has undertaken a review of the monitoring and reporting which is effective since 2008 and which takes into account the experience of the Phase I and of a stakeholder consultation. The main changes in the guidelines are for them to be closer to the sector practices' way of monitoring and reporting their activities. In addition, they need to be more aligned with reporting made by Member States, while verification procedures of the monitoring and reporting have been strengthened.

10. PRICE ANALYSIS

The existence of a carbon market is dated back to November 2003 though the EU ETS began working in January 2005. Between November 2003 and January 2005 there had been a sharp oscillation of the price of allowances contracts since at that time the Commission was still evaluating the NAPs and therefore uncertainty over the real number of allowances was set down.²⁰ The price at the opening in January 2005 was €8.38 raising to €21.10 at the end of the year. Spike of traded volume, 42.9 million allowances occurred on April 28, 2006 coinciding with the deadline of allowance surrender of installation (30 April) and peak price of €30. One major result was the clear overallocation on allowances operated in the NAPs I. This led to a progressive decrease of the EU ETS allowances (EUA) price in the market falling from a €4 level at the beginning of the year 2007 to €0.03 in December. As seen from Figure 1.3, the fate of the EUA Phase I allowances was sealed as early as April 2006 and reconfirmed through the verification of 2006 emissions in April 2007. Therefore, since October 2006, Phase II contracts have been the only ones that have deserved any attention. Price of Phase I and II are separate, in fact they are not linked since banking and borrowing are not allowed across the two Phases.

Over the course of 2007, Dec 08 EUAs traded in a range between €12.25 and €25.28. The contracts closed at €17.55 on the first trading day of the year, then declined to the year's lowest point on 20 February. The Dec 08 EUA then grew rapidly, at over €4 per month, until the high of €25.28 was reached on 29 May. Subsequently it fell below €19 twice, in July and August, before remaining largely within the €20-24 range for the rest of the year and closing at €22.43 on 31 December. In 2008 the EUA price showed a steady growth until the middle of the year peaking €29.33 on 1 July. Since October EUAs price started decreasing reaching 15.30 in the last trading day of 2008. The 2009 opened with a Dec 09 EUA price of €15.55 decreasing even further toward a minimum of €8.06 on February, 12.

Figure 1.3 EUA price on the market across Phase I and Phase II (future ECX contracts)



Source: ECX data

11. INSIGHTS OF THE FULL STUDY

The EU ETS is a particular case of emission trading firstly because it treats CO₂ emissions which are a global externality: emitting in a certain place will affect the rest of the world since this compound spreads out homogeneously in the atmosphere. This fact highlights the importance of international undertaking, because the European effort in contrasting global warming could be thwarted when other countries would continue emitting GHG according to business as usual operations. A second major issue is the approach on emissions reduction: the EU has chosen a quantity approach (cap and trade) rather than a price approach (taxation) although many have been calling for a better efficiency of the price alternative. The quantity approach sets many problems about allowance issuing among activities: emissions data series are needed but at the same time there is a leakage of track records at activity level. At the same time a quantity approach ensure the final objective, the total actual emission, since the cap on emissions is fixed: this feature made the quantity approach preferable to the price one. The outcome on allowances price has seen a marked volatility, which has been making difficult the assessment of the optimal action choices at installations level. Compared to the expectation before launching the EU ETS, the price resulted in a depreciation of allowances.

Some lessons have been learned from the first commitment time period (the Pilot Phase). The disconnection between Phase I and II became clear when it came out that the Pilot Phase resulted in a allowances overallocation. The impossibility of banking allowances across the two phases pushed the price of Phase I EUAs down to zero level. In the case that activities had been allowed to bank the allowances surplus, the occurred depreciation would have not taken place so dramatically. The reasons why a company decides to bank allowances are essentially two. The first is the case when expectation for future prices is for a higher level than the current one. The second is to offset uncertainty over the future or over supply, as for example it could be the case of more stringent cap during the third phase. Banking and borrowing then permits activities to plan their investments and actions in the market

environment to a larger time extension stabilizing the price and giving consistency to the scope of the EU ETS. Another lesson has been learnt during Phase I: the EU should aim for a more stringent allowances allocation given the over allocation of the pilot phase. This is what has actually been done for the current Phase II and it is going to be done in the third phase. Also, there should be a better future operation under allowances auctioning rather than distribution for free. The result of free allowance distribution has been in some cases a sort of subsidy to some of the activities and this has caused the so called “windfall profits” within some industries. Economists usually argue that a full auctioning should provide a better operation and efficiency of the EU ETS. As response, the Commission established that auctioning is going to be the rule starting from 2013, and it will progressively increase its share amongst the allowances distribution methods. This kind of environment should make the allowance market more predictable and help investors in planning long term strategy.

The EU ETS is integrated within the flexible mechanisms of the Kyoto Protocol. Consequently, each activity under the EU ETS is allowed to get credits as results of financed project under the CDM. More precisely, a certain amount of allowances deriving from CDM projects is permitted to comply with the assigned cap. Had the imposed emission reduction been quite low (i.e. on average some percentage points), the undertaking of Member States was not burdensome. Some of these countries have been allowed to use a considerable quantity of CDM credits, which generally are cheaper than the EUAs. All of the activities under the EU ETS have privileged CDM credits and they have made a full use of them. What has happened is that the emissions reduction needed to comply with the EU ETS has been in part produced outside Europe, especially in China. Despite the fact that the compliance with the assigned cap is taking place, one could argue that the emissions reduction are not fully occurring within Europe. At least, one could infer that the European territory driven emissions reduction compared to the “Business as Usual” scenario are not massive.

The opportunity of finance carbon reduction projects combined to the high allowance price volatility, as well as the low price of these on the market, are not good factors to new technologies development. This purpose is a major goal of the EU ETS, but the way that the EU ETS has been developing has not fostered any essential change. To understand this, one should consider that a common choice was independently made across the Member States: they have overburdened the energy sector with the bulk of the EU ETS. Therefore, the energy sector plays a key role within the trading scheme and its actions affect the ongoing process of the whole system. Cutting emissions in electricity production can be easily implemented by switching the fuel use from coal to gas. The potential of abatement is much bigger than what the EU ETS cap is nowadays requiring. In the light of the fuel markets trend, it is more convenient to electricity companies the coal to gas switch rather than responding with a widespread R&D on renewable energy in order to comply with the EU ETS assigned caps. The EU ETS is still not a major actor into the renewable energy technologies development, despite its aim is calling for. If the allowance price will result higher and if investors will have to do with foreseeable forecasts of the European and international commitment on carbon reduction, new green technologies development might spread.

CONCLUSIONS

The EU ETS is still running in the early stage of its operation. The pilot Phase finished in 2007 and just one of five years of Phase II has been accomplished. Nowadays, any judg-

ment on the EU ETS has to be made in light of this. Nevertheless some lessons have been learnt and some credits have to be acknowledged to the EU ETS.

Firstly, a carbon market like EU ETS had never been created before. In fact, in Europe there was little knowledge on how to create a carbon market and there were only a few experts at the beginning of the EU ETS implementation. In general, politicians did not know that much about emission trading, and economic interests were limited.

Therefore, a first major accomplishment is that the EU has been the **first mover** in creating an operational emission trading scheme. Today, its share in the global market is by far the biggest one. Lessons from the EU ETS can be applied to future climate negotiations and the EU, because of its current leading position, will play a **central role in the international bargaining arena. The EU ETS has been a successful tool to fulfill the Kyoto requirements.** Despite of widespread criticism over the EU ETS, since many flaws exist, one should bear in mind it is succeeding in respecting its final goal, the EU commitment to the Kyoto Protocol.

There are also accomplishments in other areas of the EU ETS.

First, the **Pilot Phase** lessons produced more stringency on Phase II NAPs since a overallocation occurred during Phase I. Banking and borrowing are going to be allowed across future phases in order to **give more price stability in the future.**

Second, even if a certain abatement occurred, it is doubtful whether the emissions reduction happened in Europe or not. A considerable part of emissions reduction is due to CDM project emissions reductions which take place outside Europe. **The effectiveness of European territory driven emissions reduction under the EU ETS is therefore ambiguous.**

Third, the low allowances price as well as the high price volatility are likely not to induce long period investments. Though it is its main purpose, **the EU ETS has still not succeeded in boosting new and permanent low carbon and energy efficient technologies.**

In conclusion, one should acknowledge the EU ETS initiative in exploring emission trading. Pilot phase lessons have produced some changes towards a better efficiency of the system in the actual second phase and overall in the upcoming third phase. Skepticism remains about the effectiveness of fostering permanent low carbon and renewable energy technologies.

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