



The future of the European Emission Trading System and the Clean Development Mechanism in a post-Kyoto world[☆]

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ARTICLE INFO

Article history:

Received 24 November 2009
Received in revised form 29 November 2010
Accepted 20 December 2010
Available online 12 January 2011

JEL classification:

Q52
Q54
O13
P48

Keywords:

CDM
Post-Kyoto
Emission trading

ABSTRACT

This paper discusses developments in the markets for CO₂ emissions rights since the Kyoto Protocol was signed. The different emissions trading schemes, dominated by the Emission Trading System of the European Union and the Clean Development Mechanism, are surveyed. These schemes will need to be incorporated into any post-Kyoto multilateral agreement. Drawing on a simple model, the paper analyzes the incentives that developing and developed countries face for continuing or transforming the Clean Development Mechanism in the light of future agreements for a worldwide emissions control program.

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1. Introduction

The challenge of reaching an agreement to mitigate greenhouse gas emissions after the Kyoto Protocol expires in 2012 seems increasingly difficult to master. Climate change is apparently progressing faster than previously expected by the academic community, including the Intergovernmental Panel on Climate Change (IPCC), and faster than predicted by climate models. Emissions have been rising faster than envisaged in the IPCC's worst-case scenarios (Raupach et al., 2007). The worldwide economic crisis has for now slowed economic growth, and with it growth in CO₂ emissions, but it has also made significant action politically less likely, at a time when reaccelerating economic growth seems more important to many than controlling emissions. The build-up of atmospheric concentrations from past emissions, together with current emissions trends, combined with new insights about the dynamics of the climate system, seem to suggest the need for either an immediate worldwide curb on emissions or drastic reductions in the coming decades, to zero and possibly even negative net emissions, if dangerous climate change is to be avoided as required by Article 2 of the United Nations Framework Convention on Climate Change

(UNFCCC), which practically all countries have signed. Yet despite these findings, the Conference of Parties in Copenhagen in December 2009 did not make the progress needed to control emissions in the near future.

Despite these challenges, and despite an apparently insufficient emissions reduction target agreed upon in the Kyoto Protocol, the period since the Kyoto conference has brought about a number of institutional and market developments that may provide a foundation for a post-Kyoto agreement. The Emission Trading System of the European Union (EU ETS) controls about half of EU CO₂ emissions, but more important, its introduction has led to a well-developed market for carbon permits. Carbon has now become a traded commodity in Europe, and a price has been established – although it is too low at the moment to provide sufficient incentives for significant reductions – that can guide business in its energy input decisions. Other markets, such as the market for project credits from the Clean Development Mechanism (CDM), are also now well established in the business community.

It has been debated whether emissions trading is a sensible concept for a post-Kyoto agreement at all.¹ That discussion will not be taken up here. Instead I will start with the presumption that emissions trading in one form or another will remain a major instrument in climate policy. The question raised here concerns the experience with

[☆] I thank the three referees as well as the editors of the special issue for very helpful suggestions.

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¹ Prominent examples are Nordhaus (2006) and Barrett (2006).

the two major emissions trading schemes, the EU ETS and the CDM, and the challenges that they face in a possible climate regime after 2012. In particular, the role of the flexible mechanisms established under the Kyoto Protocol, such as the CDM, has come into question in discussions of post-Kyoto climate policy instruments.

For example, Hagem and Holtmark (2009) argue that the CDM is actually an obstacle to a global climate agreement, as it provides developing countries with an instrument that raises considerable income from selling emissions rights to the developed world without requiring those countries to take on binding agreements to reduce emissions. If the developed world were to accept a cap on its own emissions sufficiently strong to reach the emissions targets advocated by climate scientists, such as a 550-ppmv goal for atmospheric CO₂ concentrations, the CDM system would not, they argue, be able to handle the huge demand for CDM projects created by the countries facing emissions caps.

The European Commission proposes to reform the CDM. In particular, “for advanced developing countries and highly competitive economic sectors, the...CDM should be... gradually replaced by a sectoral crediting mechanism and cap-and-trade systems” (European Commission, 2009, p. 11). This position has been strongly criticized by the International Emissions Trading Association, which has asked for a “clarification, at the earliest possible date, about which sectors will remain open to CDM activity over the medium and long-term (e.g. after 2020)” (IETA, 2009, p. 2).

Any climate agreement in the post-Kyoto period will need to subject the industrialized world to significant emissions reduction commitments and achieve sustainable economic development in the poor regions of the world without too large an increase in their greenhouse gas emissions. This requires that a number of developments will be realized: Energy and carbon efficiency will need to strongly improve world-wide requiring a smooth diffusion of new low carbon technologies. Such innovation will need to be supported by private and public R&D but its diffusion to developing countries by market mechanisms will only take place if appropriate carbon prices make these technologies profitable. The instruments with which such a challenge can be met have so far been the flexible mechanisms of the Kyoto Protocol: emissions trading, the CDM, and Joint Implementation (JI). The question is how these instruments might be improved upon, and whether they can contribute to the above objectives, and if so, how.

The challenge for the next rounds of negotiations toward a post-Kyoto agreement will therefore be to find solutions that achieve the transfers of knowledge and financial resources necessary to accomplish the transformation from a fossil fuel-based to an essentially carbon-free energy system, and do so in the most economical way. The now-well-established carbon markets could provide such an efficient instrument. Nevertheless, the current negotiations show that a post-Kyoto climate framework is unlikely to consist of a simple carbon market. Rather, it will be a complex international agreement that accommodates the different interests in a multidimensional system of climate mitigation and adaptation policies. This paper is concerned with one issue in particular, namely, the impact of the CDM on the incentives for reaching agreement on some form of global emissions constraint.

The next section of the paper discusses the experience with the existing carbon trading schemes, most notably the EU ETS and the CDM, which together currently dominate world carbon markets.² I then present a simple model for a post-Kyoto carbon market and use it to identify the impacts of different institutional arrangements on the distribution of the cost of achieving a meaningful degree of climate change mitigation, one that comes close to the objective set out in Article 2 of the UNFCCC and meets targets like those advocated by bodies like the IPCC. The paper concludes with some implications that can be drawn from the results of the analysis.

Table 1

Size of the main emissions allowance markets, 2007 and 2008.

Source: World Bank (2009). NSW, New South Wales Greenhouse Gas Abatement Scheme; CCX, Chicago Climate Exchange; RGGI, Regional Greenhouse Gas Initiative (mid-Atlantic U.S. states); n.a., not available.

Market	2007		2008	
	Volume (Mt CO ₂ e)	Value (millions of \$)	Volume (Mt CO ₂ e)	Value (millions of \$)
<i>Project-based transactions</i>				
Primary CDM	552	7433	389	6519
Joint Implementation	41	499	20	294
Voluntary market	43	263	54	397
Total	636	8195	463	7210
Secondary CDM	240	5451	1072	26277
<i>Carbon credit markets</i>				
EU ETS	2060	49065	3093	91910
NSW	25	224	31	183
CCX	23	72	69	309
RGGI	n.a.	n.a.	65	246
AAUs	n.a.	n.a.	18	211
Total	2108	49361	3276	92859
Total, all markets	2984	63007	4811	126345

2. Experience with carbon trading schemes

This section provides an overview of the two largest carbon trading schemes currently in operation, the European Emission Trading System (EU ETS) and the Clean Development Mechanism (CDM). Particular emphasis is given to the development of prices and volumes within the EU ETS. I also discuss some of the specific features of the EU ETS that have prevented it from exploiting the potential efficiency gains from a market-based system. The decision to allocate all the emissions allowances to incineration facilities, i.e., the points of emission, has led to a substantial divergence of marginal abatement costs between the sectors covered by the EU ETS and all others. This inefficiency has been aggravated by the free allocation of allowances, which has led under political pressure to a cap on emissions that was higher than would be required by an efficient sharing of the abatement burden across all emissions sources.

Emissions trading is now well established as a theoretical idea and is covered in practically every economics textbook. However, applying the theoretical idea, with its elegant approach to controlling a global externality, in the form of a workable trading mechanism for day-to-day transactions is a difficult task. In addition, there is not just one solution to establishing a carbon market but many. Consequently, several carbon markets coexist with sometimes very different designs.

The EU ETS is the largest carbon trading scheme operating in the world today, issuing about two-thirds of the total volume of carbon credits (which in this system are called EU allowances, or EUAs) worldwide, and accounting for almost 80% of carbon credit markets in terms of the value of credits traded. (Table 1 provides details on the size of the EU ETS and other markets.) The second-largest market is that for CDM credits (called certified emission reductions, or CERs). Compared with these two markets, the other carbon markets, in the United States and Australia, are tiny, with less than 2% of the world market in terms of value traded.

The EU ETS controls the emissions of large energy installations in the European Union, those with a net energy input of more than 20 MW. As a consequence, the major emissions sources within the ETS are the electricity generating companies and the chemical and steel industries. Other industries with smaller installations are not included,³ nor are

³ The minimum size threshold has been raised over time, and there has been some discussion about increasing it even further. This would exclude a large number of small installations that contribute only a small percentage of the total emissions currently covered by the ETS, thus reducing the administrative burden significantly.

² A summary of many smaller trading systems is given by Kristiansen et al. (2008).

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