Special

CO_2 Barometer

Centre for European Economic Research, Mannheim

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The EU Emissions Trading System – Incentive Effects Fail to Meet Expectations

The EU Emissions Trading System (EU ETS) is a key instrument of the European climate policy. As of the beginning of 2005, energy producers and energy-intensive industrial enterprises must surrender one emission allowance to the government per tonne of CO_2 emitted. The EU determines the total amount of available emission allowances and thus establishes a CO_2 cap, thereby ensuring that the objective to reduce greenhouse gas emissions throughout Europe by 21 per cent until 2020 compared to 2005 is achieved. Some 50 per cent of the CO_2 emissions are regulated according to this scheme in Germany. In 2011, the plants covered by the EU Emissions Trading System in Germany emitted 450.4 million tonnes of CO_2. Despite the German federal government's turn to a nuclear phase-out policy in 2011 and the on-going positive macroeconomic development in Germany, emissions were reduced by 0.8 per cent compared to the previous year.

Foto: digitalstock

In 2011, the plants covered by the European Emissions Trading System in Germany emitted 450.4 million tonnes of carbon dioxide.

Prices for Emission Allowances Reach a Critical Level

The EU ETS has been criticised heavily during the last year. The deterioration of certificate prices, which had temporarily dropped by more than 50 per cent, due to the Europe-wide over-allocation of EU emission allowances (EUAs), is one reason for the critical examination of the EU ETS. As a result of the lasting low price level of about seven euros, the EU ETS carries the risk of generating only poor incentives for long term investment in CO_2 mitigation measures.

In March 2011, the EUA price increased to nearly 17 euro per tonne in the aftermath of the nuclear disaster in Fukushima Daichi and the German moratorium on nuclear power. EUA prices, however, remained on this level only for a couple of months. In mid-June 2011, an on-going decline in prices already set in. Despite a short recovery period in February and March, prices have remained at the seven-euro-level since the beginning of 2012.

The decline in prices started with the publication of a draft by the EU Commission for a new energy efficiency directive in June 2011. The directive provides obligatory energy savings targets for EU Member States. Market participants are concerned that the implementation of the intended measures could lead to a considerably decreased demand for EUAs. The publication of the Commission's draft alone, however, does probably not explain the decline in prices sufficiently. In fact, the reason for the development observed is that numerous firms had over-allocated EUAs as a consequence of the financial and economic crisis and the persistent weak economic development in many countries of the euro area. The decrease in production resulted in reduced CO_2 emissions. Consequently, industrial enterprises demanded less EUAs in order to meet their EU ETS obligations than had

CO_2 BAROMETER

As part of a cooperative project with KfW Bankengruppe, the Centre for European Economic Research GmbH (ZEW) is conducting a survey among regulated companies and international experts of the EU Emissions Trading Scheme. The goal of the project is the analysis of the EU market for emission allowances and its development. The results are reported in an annual publication, the KfW/ZEW CO2 Barometer. Furthermore, a biannual report is published in order to provide information on recent market developments.

Surrender of CERs and ERUs for compliance (in million certificates)

	2008	2009	2010	2011	Total
EU-wide					
CERs	82,5	77,9	116,9	178,8	456,1
ERUs	0,05	3,2	20,1	75,8	99,2
Germany					
CERs	23,7	26,0	33,4	41,1	124,2
ERUs	0,0	0,67	4,2	33,2	38,1

Source: CITL (2012)

been predicted during the planning of the allocation in the beginning of the second trading period in 2008. Since the amount of EUAs issued remained constant in spite of the financial and economic crisis, the companies were able to build up substantial reserve positions of EUAs. These explanations also reflect the estimations of experts who were asked to state their opinion on the importance of different factors influencing certificate prices during the last six months. According to the experts, two major factors have impact on expectations and price formation on the market for EUAs: 85 per cent of the surveyed experts attributed a very high or high importance to the expectations regarding future macroeconomic developments, and 75 per cent consider the expectations on future regulatory frameworks an important factor.

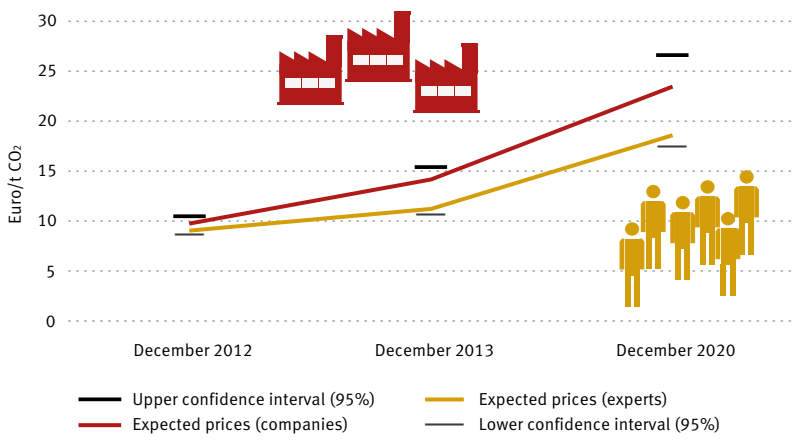
As a result of the price decline of EUAs, companies as well as experts have lowered their price expectations drastically compared to last year. The companies do not expect a recovery of prices before next year, with an expected average price of about 14 euros for December 2013 (see figure page 2). As recently as last year, companies had expected an average price of about 22 euros for one tonne of CO_2 by the end of 2013. The experts' price expectations are just below those of the companies.

Increased Trading Activity

Many of the surveyed companies reduced their reserve positions of EUAs last year by selling them. Most EUAs were purchased by companies expecting a lower allocation of free emission allowances in the third trading period which starts in January 2013. In general, the companies showed much more activity on the emissions trading market in 2011. According to the companies surveyed, 57 per cent traded emission allowances in the period February 2011 – February 2012. Compared to 2010, the trading volume has increased by 20 per cent to 9.7 billion tonnes of CO_2.

A continuing trend in 2011 is the increased use of emission credits from the project-based mechanisms of the Kyoto Protocol, the Clean Development Mechanism (CDM) and the Joint Implementation (JI). Throughout Europe, nearly 179 million Certified Emission Reductions (CERs) from CDM projects and 76 million Emission Reduction Units (ERUs) from JI projects were used to comply with EU ETS obligations. Compared to 2010, the use of CERs increased by 53 per cent, and four times as many ERUs were surrendered. The experts' expectations concerning the future development of new projects within the CDM framework, however, are rather moderate. 68 per cent of the experts expect a decrease in the development of new projects as of 2013.

Price expectations for EU allowances (EUAs, inflation-adjusted)



In this case, the 95 per cent confidence interval defines a range, that contains with a probability of 95 per cent the true parameter of the mean. The graphic shows the outer confidence intervals of the depicted means.
Source: KfW/ZEW CO_2 Barometer 2012

Poor Incentives for CO_2 Reductions

The EU ETS currently generates only low incentives for taking measures to reduce CO_2 emissions. 71 per cent of the companies have made investments or implemented modifications in the production process that reduced carbon dioxide emissions. For 91 per cent of the active firms, however, CO_2 reduction was only a side effect of investment and optimisation measures they would have taken anyway. The objectives of these measures, however, were reducing costs for energy and raw materials as well as exploiting general efficiency potentials (see upper figure page 3).

Markets for Emission-Reducing Technologies

Regulated firms prefer options that involve only small scale investments, particularly if CO_2 reduction is regarded as the main objective. In contrast to this, consistently high energy prices encourage investments with the main goal to increase energy efficiency. This way, CO_2 abatement occurring as a side effect is supported. Companies that have already taken CO_2 abatement measures in the past tend to continue their efforts and avoid carbon emissions in the future, too. As in the past years, nearly two thirds of the companies plan to take reduction measures during the third trading period (2013-2020). The percentage of firms that consider CO_2 abatement the main reason for the planned implementation of the measures, however, decreased from 25 per cent (2011) to 17 per cent (2012). At the same time, about 30 per cent of the companies that plan to take capacity-increasing measures in the next five years are going to reduce their CO_2 emissions – despite the low price level for emission allowances.

Technological progress opens up possibilities to lower CO_2 emissions and thus

the CO_2 intensity, which is vital for the success of the EU ETS. The aim to decarbonise the European economy and, at the same time, to preserve its competitiveness in the long term requires new technologies and products. So far, a total of 56 per cent of the surveyed firms have introduced new abatement technologies. 40 per cent of the firms have purchased new abatement technologies on the market and 16 per cent implemented internal R&D projects. Accordingly, markets for preventive technologies are of considerable relevance for the decarbonisation of the German economy. Especially the machine and plant engineering sector plays a key role in the development and diffusion of "green innovations". In general, there are only very few surveyed firms that consider preventing CO_2 emissions a strong motive for their efforts in developing innovations. Similar to the implementation of preventive measures in general, factors such as the reduction of energy intensity play an important role for the decision to develop or purchase new technologies.

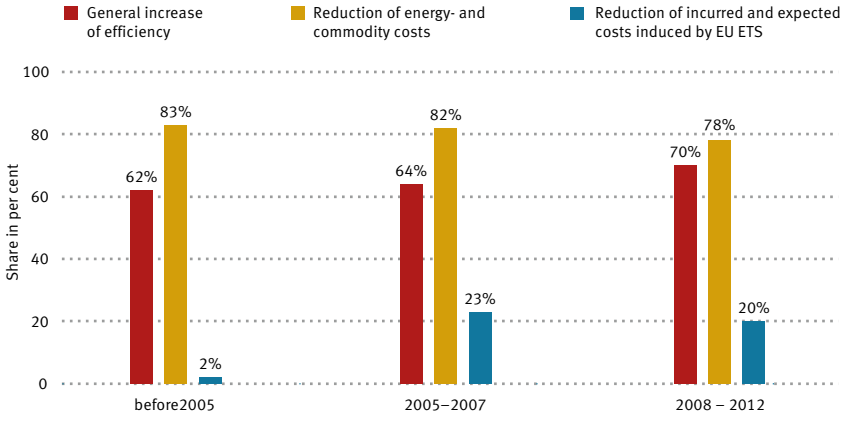
Currently low Risk of Carbon Leakage

Since the beginning of the EU ETS it has been assumed that the European emissions trading may bring forth distortions in international competition. Distortions arise if European companies, whose production plants are subjected to the EU ETS, compete with companies whose production facilities are located in a region without comparable climate policy regulations. The higher the additional burdens for a company, the higher is the incentive to invest outside Europe and to relocate production into regions with less regulation (investment leakage). CO_2 emissions, however, are thus not cut down but shifted from EU ETS regulated regions to countries and regions with a less strict regulation of climate policy (carbon leakage).

The companies were asked to state the most important factors for economic efficiency in the manufacturing of their products to examine the extent of the carbon leakage phenomenon. 76 per cent of the companies stated that energy costs are one of the most important factors, followed by costs for primary products and raw materials (42 per cent). The costs of climate policy regulation only play a minor role. In this context, it is not surprising that 61 per cent of the companies named energy costs as one of the most important criteria for strategic location decisions when it comes to new investments, followed by the proximity to the sales market (52 per cent). Only 13 per cent of the companies consider the costs for climate policy regulation an important aspect for their decisions on plant location (see lower figure page 3).

Looking at past and planned production expansions, investment leakage is apparently a minor threat. In 2011, 57 per cent of the companies produced solely in Germany, 12 per cent in Germany and other countries of the EU, and 31 per cent had additional production plants outside the EU. Comparing past and planned expansion, it becomes evident that the share of companies which plan an expansion of production capacities outside the EU remained almost the same. 30 per cent of the companies implemented a production expansion outside the EU in the past five years and 31 per cent are planning to do so within the next five years. A major reason for planned capacity expansions in countries outside of the EU, and hence outside the regulation of the EU ETS, is their increasing importance as sales markets for the regulated companies. Moreover, there is no evidence for a substantial slowdown of the capacity building within Europe despite the planned production expansions outside the EU. The survey results thus do

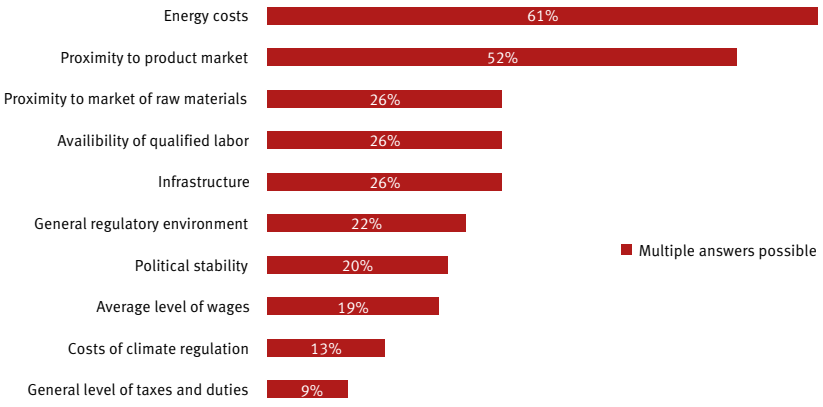
Reasons for the implementation of CO_2 abatement measures



Source: KfW/ZEW CO_2 Barometer 2012

Decision criterion for investment

Which of the aspects listed below are most important for future decisions on plant location (new investments in a certain region) for your company?



Source: KfW/ZEW CO_2 Barometer 2012

not indicate that the EU emissions trading could be held responsible for a considerable outflow of investment to countries outside Europe. Yet there is evidence for a risk due to electricity price increases caused by emissions trading, since the surveyed companies regard energy costs as the most important criterion for future decisions on plant location. The actual risk potential, however, depends on the electricity intensity of the production in the sectors concerned and on the emission allowances prices.

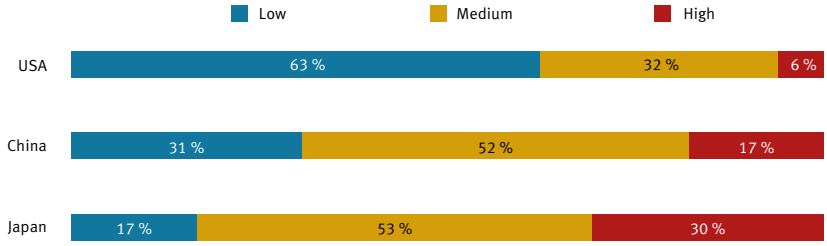
Non-European Carbon Trading Initiatives

During the World Climate Summit in Durban in November 2011, the contracting states of the UN climate convention agreed on a common plan for the establishment of a new agreement on climate change. The objective of the plan is the drafting of a global agreement on climate change that will be valid from 2020. The basis of the agreement is to be developed by 2015. The agreements achieved comprise a second commitment period of the Kyoto Protocol and the configuration of a newly established climate fund worth 100bn US dollars annually from 2020. The fund aims to support the implementation of climate protection and adaptation measures in developing countries. The expectations of the surveyed experts about a possible settlement on a new climate agreement within the framework of the Durban platform are rather cautious. A majority of 53 per cent expect a medium probability regarding an agreement until 2015, whereas 34 per cent of the experts estimate that there is a very low probability. Only 13 per cent of the surveyed experts think it is highly probable that a new agreement will be reached by 2015. An essential element of the negotiations on the new agreement will be binding reduction targets for the participating states. Especially the performance of the major emitters, such as China and the United States, will be a decisive factor for the progress of the negotiations. The surveyed experts consider it not very probable that the United States will enter into binding reduction commitments. The expectations for China and Japan are, however, more positive (see Figure page 4).

At the same time, the efforts to install national CO_2 emissions trading systems are increasing worldwide. Apart from South Korea, Mexico and Australia, it is also China that promotes the development of an emissions trading system. Already from 2013, seven Chinese regions are going to start pilot systems that serve as a preparation for a national emissions trading scheme (ETS). Although only little information about the structure of the pilot system is available at the moment, the surveyed experts are optimistic. 33 per cent assume with a high probability that a national ETS in China will be introduced by 2020. 48 per cent think that there is an average probability and 19 per cent consider such a development improbable. Moreover, the mergers of already existing systems are being promoted. Quebec and California are planning to connect their emissions trading systems until 2013. Experts hope for a worldwide new dynamic in climate negotiations and on the carbon markets through unilateral efforts by large emitters like China.

Binding targets for CO_2 reduction

How do you estimate the probability that a new international climate agreement on the basis of the Durban platform includes emission reduction targets for the USA, China, or Japan?



Source: KfW/ZEW CO_2 Barometer 2012

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The Barometer in the web: www.zew.de /co2panel
Editorial supervision and responsibility: Prof. Dr. Andreas Löschel, Phone +49 (0)621/1235-200, E-Mail loeschel@zew.de
Project team: Prof. Dr. Andreas Löschel, Benjamin Lutz, Phone +49 (0)621/1235-204, E-Mail lutz@zew.de
Centre for European Economic Research (ZEW) Mannheim
L 7, 1 · 68161 Mannheim · P.O. Box 103443 · 68034 Mannheim · Germany – Phone +49 (0)621/1235-01 · Fax + 49 (0)621/1235-224
Internet: www.zew.de, www.zew.eu