

CARBON MARKET MONITOR

Countdown to Paris

6 November 2015

TO THE POINT

The 21st Conference of the Parties to the UNFCCC will take place in Paris from 30 November to 11 December. After the failure in Copenhagen in 2009, much hope is pinned on this session to deliver an international climate agreement.

So far this year, there have been many reports of more trust and a more positive atmosphere among negotiators. Also the old fault line between developed and developing countries seemed to have become blurred. However, it resurfaced at the last preparatory session in Bonn from 19 to 23 October, in a clear sign that the Paris agreement is still far from ready to be signed off.

A much shortened draft proposal was rejected and negotiators returned to a version full of different alternatives on all major topics, which currently stands at 51 pages, of which 31 relate to the core agreement, 20 to subsidiary decisions.

The challenges that need to be overcome are by no means limited to mere discussion of form and wording. One of the main points of contention is the pledge of mobilising 100 billion USD for climate activities in developing countries. Developed countries claim to be well on their way to reach this target, but developing countries are not yet convinced.

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Carbon prices and volumes

Contract	Price	Volume
EUA Dec-15	€8.64/t (8.15)	288.2 Mt (342.6)
sCER Dec-15	€0.63/t (0.49)	7.6 Mt (2.8)

Prices on the last trading day of October and monthly traded volume of all contracts, in parentheses figures for September. Volumes of EUAs and CERs traded and cleared on ECX, GreenX, and Nord Pool.

EUA price forecast 2015 - 2020: €13.2/t

Average fair price assessment for 2015-2020 EUAs.

Source: Point Carbon's Carbon Market Trader. Updated on 30 September 2015.



FOCAL POINT

Who supports the EU ETS?

Trends in the Carbon Market Survey

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Far from constituting a bipolar struggle of “government vs. industry,” climate regulations and carbon pricing present a set of incentives and interests that vary at several different levels. Cap-and-trade produces different levels of costs and benefits to different types of firms, which leads to diverging interests.

Based on five years of data from the Thomson Reuters Carbon Market Survey, we find two dimensions in corporate opinion on carbon trading. One relates to the general affinity toward the EU ETS during the time when the survey was conducted. This aspect is partly opportunistic and relatively short-term. Firms may find an ETS in their interest for PR purposes, to gain competitive advantage over competing firms in the same sector, or, perhaps most importantly, to avoid the alternative of direct regulations or taxes.

The other dimension expresses concern about long-term strategy and carbon leakage, as the effects of carbon pricing and potential plans to leave Europe due to carbon costs emerge. Concerns about long-term viability appear, notably in a scenario where other world regions do not take steps to reduce their GHG output. Both effects are present, and are found across sectors as well as among firms within the same sector.

Additionally, we find that both firm- and sector-level considerations affect the positions on these two dimensions, but in different ways. At the firm level, bigger companies are more likely than small ones to support cap-and-trade, possibly because of its current state of oversupply. In other words, being a large firm increases the probability of preferring the policy status quo, possibly to extract benefits such as the opportunity of presenting a climate friendly or green image.

At the same time, bigger emitters are more likely to consider moving their production abroad if CO₂ prices rise, possibly because they have the material capacity to relocate.

At the sector level, we find that the aggregate volume of emissions significantly influences relocation considerations. This indicates that the companies with higher emissions per unit of output in medium-emission sectors (e.g. heavy manufacturing and refineries) may be the most important opponents of carbon pricing: they benefit less than the largest firms from an ETS, while facing equally strong incentives to relocate their production facilities.

DIVERSE AND CHANGING INCENTIVES

Cap-and-trade is a policy instrument that on the one hand causes concerns for extra costs, but on the other hand offers political benefits to the companies whose emissions are capped, especially because carbon caps are often implemented progressively. In an initial phase when the policy is more lenient, the covered firms tend to receive more emission allowances than they need, in other

words they receive “free money” (they have the option to sell their surplus allowances). This can actually make them more economically competitive vis-à-vis foreign competitors with no free allowances, and also more attractive because they appear as more environmentally responsible.

The arrangement of preferences should be different when the policy becomes more stringent, which is when emission caps and allocations shrink, or when the share of auctioning grows at the expense of free allocations. The sentiments captured by economic costs and political benefits are conditional on the type of firms and sectors under consideration. Focusing first on firm-level dynamics, we argue that small firms should be systematically less supportive of emission trading when the policy is lenient because they have more to gain from more stringent caps due to their relative efficiency and their marginal importance on the issue. In other words, to the extent that cap-and-trade means unambitious caps and cheap allowances that evoke low adjustment costs and high political advantages for the most protected companies, small firms should be less supportive of an ETS than larger firms.

In contrast, to the extent that cap-and-trade means high caps and more expensive allowances, the policy should evoke higher adjustment costs and low political advantages. Thus, larger companies should have more to gain from lenient emission trading, because they are more privileged in terms of protection from the government.

If we consider a more stringent ETS, then firms’ opinions should be significantly different. More emission cuts and an increase in the long-term carbon constraint represent a move from the status quo towards a more uncertain policy equilibrium. This should evoke higher adjustment costs and more uncertain political opportunities. Consequently, we expect that a long-term trend towards more stringent carbon caps should lead to political opposition or, absent rapid technological change, relocation.

We argue that smaller firms that have more to gain from a more stringent ETS do not need to consider relocation because for them the threat of moving production overseas is not credible in case they want to extract political rents from their national governments. By contrast, larger firms are likely to consider relocation to escape the cost of environmental restructuring or, alternatively, to signal their veto power to their governments.

DATA AND RESEARCH DESIGN

We use the Carbon Market Survey, an annual online poll conducted by Thomson Reuters Point Carbon, to test our hypotheses. The survey has been conducted every year since 2007. Most firms that are covered by the ETS regulation are invited to take part in the survey, based on e-mail addresses from the Community Independent Transaction Log (CITL). The survey is also open for opt-in respondents. Participants receive a free copy of the resulting survey report as an incentive to complete the survey. The sample includes

participants from industries regulated by GHG caps or taxes, financial services, regulators and GHG emission reduction project developers. Verifiers, NGOs and researchers may be also included, although they constitute a smaller portion of participants.

In our study we are mainly interested in companies' positions towards the ETS. In particular, we are interested in variation of positions across different aspects of the EU ETS. We identify five survey questions that work for our purposes.

Cost Efficiency and Maturity correspond to the participants' level of agreements with the following statements: "The EU ETS is the most cost-efficient way to reduce emissions in the EU" and "The EU ETS is a mature market." The response scale for each of these, respectively, is a five-point interval that goes from 1 'Completely disagree' to 5 'Completely agree'.

CO₂ Reduction is the response given to the question "To what extent has the EU ETS caused your company to reduce its own emissions?" Here the response scale includes 1 for 'the EU ETS has not yet started causing emission reductions in our company', 2 for 'the EU ETS has not caused emission reductions in our company', and 3 for 'the EU ETS has already caused emission reductions in our company'.

Salience of CO₂ price is the response to the question "How important is the long-term carbon price (e.g. in 2020) for new investments in your industry?", where the answers are scaled from 1 No importance to 3 Decisive factor.

Finally, *Relocation* is based on the question "Has your company considered moving production outside the EU ETS area because of carbon costs?" and is scaled between 1 for 'Yes, have already moved production' to 4 'No, does not consider moving production'.

To use the response data, we need to transform them at the unit level of analysis, which are our similarly 'grouped' companies. We collapsed the values of the responses taking the mean of all the values of the similar companies. For example, for all small UK emitters (e.g. less than 500,000 GHG tonnes) companies in the construction sector in 2009, we take the mean of the indicated answers. We rescale the answers so as to assign lower values to more hesitant positions (that is, more conservative preferences) and higher values to more proactive positions. We round the means downwards, to make sure we anchor the responses to the status quo, which we expect to have a strong predicting power. Finally, we dichotomize these five variables to ease our empirical inferences.

EXPLANATORY VARIABLES

In order to test our hypotheses, we require indicators that capture the commitment of firms and sectors to climate policy. We focus on emission levels, because these are the most direct measurements. To measure companies' emissions, we rely on self-reported levels of CO₂-equivalent greenhouse gases indicated at the end of the questionnaire.

We also identified the members of the following sectors: power and heat; metals; oil and gas; pulp and paper; cement, lime and glass; chemicals; aviation; food industry; and other. We matched the companies that belong to each of these sectors with external, observational measures on annual sectoral emissions, using the CAIT data from the World Resources Institute. Based on within-country distributions we split the sectors' emission level at the median and generated the dichotomous explanatory variable called *Sector: high*

CO₂ emitter. This takes the value of 0 if the grouped companies belong to a sector with yearly emissions below the national median, and 1 otherwise.

We also include unit labour cost of the country and the logarithm of GDP as additional explanatory variables, to evaluate alternative explanations. Unit labour costs (ULC) measure the average cost of labour per unit of output. These scores are also standardized.

ANALYSIS

Our analysis starts with an exploration of our survey response variables. Our theory suggests that firms should systematically distinguish their preferences for aspects of the ETS related to costs and opportunities. Thus, our first goal was to assess whether the firms' survey responses used to measure firms' issue-specific preferences are arrayed in ways that suggest multidimensionality. For our purposes, we used the five variables highlighted in the previous section, which we assume to provide latent information on the overall positions of European firms on the ETS. In order to evaluate multidimensionality, we proceed with an exploratory factor analysis.

The results from our factor analysis are reported in Table 1. We find that the five variables from the survey converge on two major dimensions: one on the perceived performance of the ETS as a regulatory tool, and the other on the impact of the ETS on the respondent's individual firm. Evaluations of the cost-effectiveness and maturity of the current ETS – what we may term the latent satisfaction with the ETS – load the most strongly on the first factor. The second factor is most strongly associated with the question of relocating operations and, to a lesser extent, with the perceived salience of the long-term CO₂ price.

Having established some relevant multidimensionality in the response variables, we tested our hypotheses. We concentrated on the correlations between the survey responses and our firm- and sector-level emission indicators via a regression analysis.

Figure 1 summarises our first regression result: that the size of a firm's emissions is a reliable predictor of satisfaction with the current state of the EU ETS. We observe a positive and statistically significant coefficient for *Firm: high CO₂ emitter*. Respondents from large emitters are more likely to think of the EU ETS as cost-efficient, and this finding is statistically significant at the 95 percent level.

Smaller emitters show correspondingly lower evaluations. As one respondent said in an open-ended follow-up question in the 2012 Carbon Market Survey, the system "[a]pplies to large point source emitters; emissions trading is not so efficient or practical for smaller diverse emitters." Or another, in 2015: "It is an unfair system for the little and medium emitters. [...] monitoring and reporting are a heavy task... for nothing in reducing emissions on the whole."

This result suggests that firms with high levels of emissions are more satisfied with the introduction and workings of the EU ETS, all else equal. Put differently, the policy design of the EU ETS is more favourable to large emitters than smaller ones. Who are these large emitters? Many are large firms with large production volumes in an overall emission-intensive sector and medium-sized firms with higher emissions per unit of output than the average of their sector.

Firms that are generally large may gain from the ETS notably from their ability to employ specialists in carbon management and trading, thus identifying optimal strategies for complying with the regulation. Furthermore, firms with relatively inefficient, high-

emitting processes, may see an advantage in the ETS in that they are not subject to more demanding environmental regulations such as taxes or facility-level emission limits.

By contrast, smaller and cleaner firms may see the ETS as less than optimal, as a carbon tax would have provided them greater competitive benefits. Also, the smaller firms might not have the possibility to employ specialists devoted to finding optimal emission reduction strategies.

Another way to test the hypothesis related to firm size and managerial capacity is to look at changes over time in attitudes toward the ETS. If larger firms were better able to relate to the ETS at first, it is likely that smaller firms would catch up over time, increasing their familiarity with and thus the acceptance of the ETS. Our data provide some support to this hypothesis. Notably, the difference between large and small emitters in assessment of ETS cost-effectiveness stands at 10 percentage points in 2009 and 9 percentage points in 2010 (a difference that is also statistically significant). However, this difference declines to less than 1 percentage point from 2012 onwards. This effect could conceivably be related to falling carbon prices from 2012 onwards; however, it can be shown that permit prices do not play a significant role in explaining attitudes toward the ETS in our data.

We also interpret the correlation patterns between satisfaction with the ETS and *Sector: high CO2 emitter*. A sector's aggregate volume of CO2 has a positive coefficient, which indicates that more carbon-intensive sectors are more likely to express support for the current features of the ETS. However, the relationship is not as robust across different variations in model type (such as linear, dichotomous specifications) and thus appears less solid.

We ran the same type of model on the second set of scores that we calculated for Factor 2, which we interpret as proxies for concerns with the future costs of the ETS. Here we find that higher levels of firms' emissions are associated with higher loadings on Factor 2. (Detailed results are found in the full paper.) Substantively, firms that produce larger volumes of CO2 are more likely to be sensitive to the long-term costs of the ETS and the possibility of relocation.

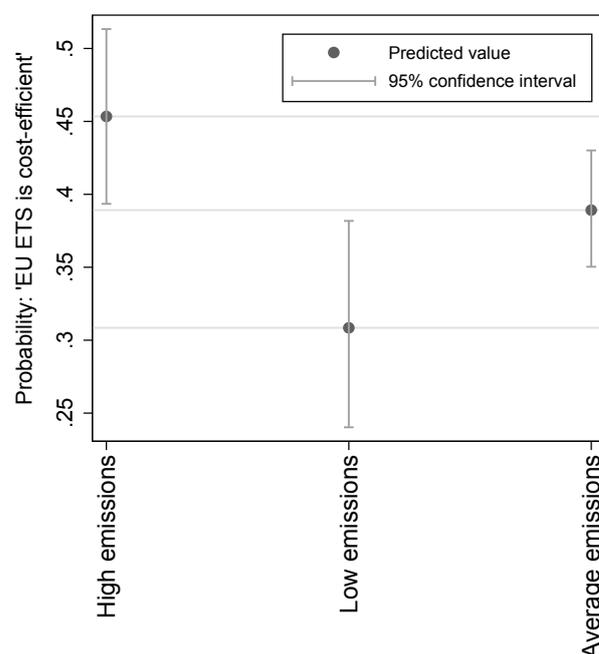
Keeping everything else constant, the difference in predicted long-term concern between low and high CO2 emissions at the firm level (keeping all else equal) is roughly 2 percentage points. This supports our argument that, on the one hand, large emitters will support the current lenient state of the EU ETS for opportunistic reasons captured by Factor 1, but, on the other hand, they also have credible incentives to oppose reforms to tighten the cap and relocate if the EU ETS were to become more stringent in the future (Factor 2).

This article reports on work in progress on time-series analysis of data from the Carbon Market Survey. The authors would welcome any feedback or additional information. Please e-mail etv021@uni.no or fgenov@essex.ac.uk.

Table 1. Key dimensions of responses. A (+) indicates that the variable is positively associated with the factor. Please see the full paper for details.

	Factor 1: Latent satisfaction with the EU ETS	Factor 2: Severity of ETS in respondent's firm
The EU ETS is cost-effective	++	
The EU ETS is mature	+	
The EU ETS has led to reduced emissions in my company		
The CO2 price is salient for investments in my industry		+
The EU ETS has led my firm to move or consider moving		++

Figure 1. Evaluation of ETS by emission level of respondent's company.



Source: *Climate Regulations and Carbon Pricing: Business Preferences for the European Emission Trading Scheme*. F. Genovese and E. Tvinneheim, August 2015.