



## *Executive Summary*

# THE ROLE OF AUCTIONS FOR EMISSIONS TRADING

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## ***The Role of Auctions in Emissions Trading: Executive Summary***

**Karsten Neuhoff and Felix Chr. Matthes**

The European Union Emissions Trading Scheme (EU ETS) is a central pillar of European climate policy, which has many strengths but also opportunities for improvement. The EU ETS:

- puts a price on carbon for investment and operation decisions- the carbon price is also intended to feed through the value chain to incentivise CO<sub>2</sub>-efficient production and use of products and services;
- creates clear accounting rules to ensure management focus;
- creates incentives for low-carbon innovation and investment;
- generates revenues through payment of the carbon price, which can be used for variety of valuable applications;
- allows government to credibly commit to a low-carbon trajectory, with a clearly defined emissions target and cap for the installations under the EU ETS.

As well as being an essential part of the EU's commitment to reduce its own emissions the EU ETS is a component of, and serves to reinforce global efforts. It is the major driver behind the global carbon market, which assists low-carbon investment in developing countries through the use of project credits and auction revenues. The scheme has the potential to be the 'strongest currency' in a network of interlinked emissions trading schemes that are already emerging in different parts of the world. An effective European system post-2012 could form a focal point for global negotiations up to the Copenhagen 2009 conference and beyond.

However, the EU ETS in its current design is far from perfect and to deliver the far-reaching objectives of effectiveness, efficiency and innovation, a significant revision of EU ETS after the first two trading phases is required. In particular, experience has revealed a number of serious problems arising from the free allocation of emissions allowances. A key element of the EC package proposes that most emissions allowances for the period beyond 2012 should be sold in auctions rather than handed out for free to emitters.

This report explains the economic rationale for auctioning, and examines the practical implications.

### ***1. Problems of free allocation and the rationale for auctioning***

Within a given cap allowances can be either given out for free or auctioned. Extensive analysis and accumulated evidence suggests the following:

1. Within the framework of the EU ETS as a multi-period scheme with a series of direct and indirect updating provisions, free allowance allocation distorts the carbon price signal for efficient investment, operation and consumption choices; uncertain future allocation rules complicate investment decisions.

➤ *Auctioning creates a robust policy framework, ensures efficient corporate and private decisions that contribute to the most economical response to climate policy, and removes uncertainties about further changes in the allocation scheme.*

2. The wide range of options for free allocation of allowances was used by many Member States, in the first two phases of the EU ETS, to offer support for the continued use of carbon intensive technologies and production processes. These approaches delay market opportunities and create uncertainties for low-carbon alternatives.

➤ *Auctioning creates a clear and transparent market framework for innovation and investment in low-carbon processes, products and services.*

3. Free allowance allocation distributes public assets to the operators of installations, which are often financially strong companies. These companies are not required to use the income either for investment and innovation in low-carbon options or for any other activity that benefits the country that issues the allowances.

➤ *Auctioning creates government revenue to support innovation, cooperation with developing countries, tax reductions to support economic growth and to address the economic hardship of high energy prices for poor households.*

Free allowance triggers public opposition to windfall profits, as illustrated by the 2006 debates in Germany, Netherlands, UK, Spain and Scandinavia. This can spread to other countries and sectors, and undermine support for EU ETS. National responses, such as windfall profit taxes, also create investment uncertainty and can create distortions between European countries.

➤ *Auctioning provides a fair and simple scheme to enhance public support for climate policy and thus contributes to long-term investment security.*

Given these factors, the EC package is right to place the ‘burden-of-proof’ on why allowances should be given out for free. Eight years after the introduction of the EU ETS with almost free allocation for two trading periods, the most serious argument in favour of free allocation could be the need to avoid leakage. However, the existing indications show that serious leakage problems only could occur for a narrow range of sectors and products. Only certain types of free allowance allocation can address this leakage concern and these must be tailored to the specific requirements of the sector. Other options to address leakage, such as provision of State Aid or border adjustment, might be more suitable.

Careful analysis and international cooperation is required to find the most suitable solution. Premature commitment to free allowance allocation for specific sectors obstructs the choice of the most effective policy instrument to tackle leakage concerns. It also pre-empts the outcome of international discussions on climate policy and thus undermines international cooperation on effective climate policy.

Any decision on specific instruments needed to address leakage requires careful and well-founded analysis. If leakage concerns are the primary motivation for the debate on free allocation and its alternatives, the complex issues of identifying leakage-sensitive sectors, the differentiation between operational and investment leakage problems, and the most practical and least-distorting implementation approaches of compensation measures, must all be analysed in a comprehensive way.

The remainder of the report sets out findings with respect to auctioning in the power sector and manufacturing industry.

## ***II. The role of auctions for the power sector***

The power sector represents the largest share of emissions covered by the EU ETS. No serious leakage concerns can be identified for the power generation sector in the EU-27. Against this background there is no reason to exempt any party in the electricity generation sector from allowance auctions.

Furthermore, from the first two phases of the EU ETS, robust evidence of the pass-through of the full costs of carbon in liberalised electricity markets exists. This trend was observed even in cases where a significant share of the allowances was allocated for free. As the new Member States are now also liberalising their power markets, the same effect is currently being observed in these countries.

Our analysis suggests that cost increases for fossil fuel based power generation, and the associated increases in wholesale prices, are unlikely to result in large scale relocation of power generation to countries not covered by EU ETS. This is because of the limited existing interconnection capacity, the time delay in network expansion and the uncertainty surrounding the long-term viability of projects. The concern about relocation of electricity intensive production processes in response to power price increases is constrained to a few sectors, and is most likely better addressed by direct measures like State Aid.

## ***III. Equity considerations***

The purpose of emissions trading is to create incentives to shift production and consumption choices to less carbon-intensive products and services. This shift is intrinsically gradual, and will be accompanied by continued emissions. The draft Directive of the European Commission proposes for the cap within the unilateral EU target a budget of 2 billion allowances for 2013 that falls to 1.7 billion by 2020. At a carbon price of 30 Euro/t CO<sub>2</sub>, the rights to emit this carbon are valued at 50 to 60 billion Euro annually.

The allocation will thus have significant distributional impacts and will raise equity issues – that if miss-handled may reduce the political acceptability of the ETS in the long-run. Free allocation will generally make high-income households better off compared to low-income households, since they tend to benefit more from higher share price increases. Auctioning of allowances creates public funds - some of which can be used to compensate poor households for short-term increases of energy and commodity prices associated with climate policy.

This can be illustrated by the example of the power sector: Compensation for poor households for the power price increases can involve direct payments, increases of benefits and pension schemes, or support for investment in energy efficiency measures. Auctioning in the power sector provides the necessary financial resources.

## ***IV. Empirical and analytic evidence on leakage***

If auctioning is the generic approach to allocation for the EU ETS from 2013 onwards, the question is raised for which sectors and products leakage presents a serious concern. Detailed analysis is available on cost increases due to carbon prices in different sectors across many countries. Analysis suggests that leakage is not an economy-wide problem, but is specific to individual activities.

Detailed analysis for Germany and the UK shows that only 1% to 2% of GDP is associated with activities that face significant cost increases from carbon pricing. These activities are, however, significant in terms of emissions. Therefore it will be important to avoid leakage in these sectors to ensure environmental effectiveness.

Many factors have to be considered in assessing whether leakage really is a concern in the sectors that have been identified in the existing analysis. Three approaches are currently being pursued to see whether a sector with significant cost increases could be subject to leakage, and to evaluate the different mechanisms and where they are required to address leakage concerns.

- Empirical evidence of leakage – or no leakage – based on changes of trade flows or investment choices is desirable. However, with less than two years of significant carbon prices during the first trading period, the observation period is short. Also, with large increases in fossil fuel and commodity prices it is more difficult to identify changes that can be attributed to carbon pricing. Hence it is too early for empirical data to give robust evidence on the existence or non-existence of leakage.
- Economic models of the entire economy, like Computable General Equilibrium approaches, offer the opportunity to assess the interactions across production processes and terms of trade. They have provided robust results that leakage from relocation of production has only a very limited impact on the overall economy. The model resolution is currently not high enough to analyse the risk of leakage in individual activities. The analysis also points to the potential interactions for fossil fuels with global markets. While not directly relevant to the analysis of leakage effects associated with industrial production, it does warrant further analysis on an empirical basis and possible policy responses.
- Analysis of individual sectors shows that the leakage problem differs in nature between sectors. First, leakage concerns as a result of the direct costs of CO<sub>2</sub> from the purchase of allowances are assessed. With respect to leakage concerns, these CO<sub>2</sub> costs are significant for only a few sectors or products. Second, indirect costs from CO<sub>2</sub> cost pass-through in the power sector are far less relevant than direct costs in other key sectors with leakage concerns. Third, the different leakage mechanisms must be considered. Whilst short and medium-term operational leakage as a result of relocation of production from existing installations is a major problem, it is only relevant to a few products. For some other sectors investment leakage might be of concern, specifically where the relocation of production is linked to investment decisions for new facilities.

This illustrates that the analysis of leakage concerns requires a sector specific assessment. Only a narrow selection of sectors could prove to be relevant regarding leakage concerns. This study presents different approaches to identifying sectors where leakage could potentially occur and where provisions to avoid leakage might be necessary. We identify indicators of direct and indirect CO<sub>2</sub> costs, gross value added (at factor costs), trade-intensity and capital-intensity of the sectors or products as robust and suitable approximations for the reliability of leakage concerns. In addition to these indicators; transport costs, expected growth of production, and product differentiation should also be considered for the in-depth assessment of leakage concerns.

## ***V. Policy instruments to address leakage concerns***

The portfolio of provisions to deal with leakage concerns is significantly larger than that of free allocation of allowances. No individual measure is suitable to effectively address all forms of leakage given the variations of leakage concerns.

The experience from the first two phases of National Allocation Plans was that the repeated free allowance allocation created perverse incentives for market participants. The ability of the EU ETS to support effective investment, operational and closure decisions has been limited. One important motivation for the move to auctioning was to avoid these distortions.

The justification of free allowance allocation post-2012 lies in its use as a mechanism to address potential leakage concerns. However, any attempt to address these leakage concerns through allocation must be conditional on investment, operational and closure decisions of firms. This illustrates that free allowance allocation as an instrument to address leakage will create perverse incentives for and undermine the efficiency of investment, operational, closure and consumption decisions.

- Free allocation to existing installations coupled with plant closure provisions could prevent leakage as a result of relocation of facilities. However, the first two trading periods have demonstrated the difficulty in formulating effective plant closure provisions, particularly in sectors with many or complex site installations.
- Free allocation to leakage-sensitive new entrants could reduce the incentive to locate new facilities in regions without carbon pricing. In the first two trading periods support was usually technology specific, thus reducing incentives to shift to low-carbon fuels. Outside of the power sector the definition of uniform benchmarks has proven difficult, thus the incentives for investment in energy and carbon efficiency have been limited.
- The design of free allocation to address operational leakage from existing installations is challenging. In theory, linking the allocation to current or recent production volumes is effective. In practice, ex-post adjustments of allocation volumes create uncertainties for the entire scheme and have been excluded by Commission and Parliament. They also create administrative constraints that restrict innovation in production processes and substitutes.
- For all options, the specific design of the allocation provisions is crucial to prevent operational or investment leakage. The definition of benchmarks will play an important role. If the benchmarking scheme for free allocation reflects technology, fuel, and other specifics of the respective installations, it could further increase the cost of emissions reductions.

A second option for dealing with leakage concerns is direct compensation (State Aid) applied to support investment or re-investment in sectors that are at risk of leakage. This could help to avoid leakage from capital-intensive investment with leakage effects that could be far-reaching in the future. Thus State Aid could replace free allocation in leakage-sensitive sectors. According to our preliminary assessment this approach could provide more certainty to investors in sectors which are sensitive to investment leakage (i.e. capital-intensive sectors), than implicit capacity payments from free allocation in a multi-period emissions trading scheme in the context of an emerging multilateral climate regime. However, potential

difficulties in gaining State Aid approval within the EU must be addressed early and consistently to avoid legal and regulatory aspects of State Aid create significant barriers to the introduction of direct compensation.

A third option for addressing leakage concerns is the use of border adjustments. This approach is very similar to value added tax. An example could be the implementation of an import duty, corresponding to the costs a domestic producer with best available technology faces when buying allowances. Exports are reimbursed for the cost at the same level. Thus the combination of full auctioning and border adjustment does not discriminate against foreign producers – an important aspect needed to ensure WTO compatibility.

The challenge for border adjustment is not the economic dimension, or WTO legality, but the political implications. After all, developing countries have experienced decades of border measures that hindered their economic development and might see border adjustment as a further impediment. This would undermine efforts for international cooperation on climate policy.

Border adjustments can therefore only be taken forward in an international approach. To gain the support of other countries, it will be important:

- To clearly demonstrate the need for border adjustment to ensure environmental effectiveness of emissions trading with auctioning – by allowing the carbon price to feed through the economy and preventing the use of free allowance allocation that undermines incentives for innovation.
- To discuss in an international and transparent manner all aspects related to the approach, in order to develop a common basis of understanding and trust for cooperation on potential implementation of border adjustment. This could be done either by using informal platforms or through formal institutional arrangements, to limit the use of border adjustment in scale and scope.
- To focus border adjustment on a narrowly defined group of products and implement it in a way that does not discriminate against foreign producers.

Border adjustment is not the solution for all leakage concerns, but can provide one economically effective option. As such it is worthwhile exploring the detailed provision and international structures required for its potential implementation.

A key result from the analysis of leakage concerns is that a combination of provisions will be required, not only to ensure that the wide range of leakage concerns are effectively addressed, but also to provide a tailored solution that is suited to the basic architecture of carbon pricing within the EU ETS. In this context, free allocation will not play a major role if leakage concerns constitute the primary motivation.

The emerging international climate regime, which will take shape in 2011, will have a significant impact on the role of free allocation and other measures to avoid leakage for the trading phases beyond 2012. However, the interactions between the international regime and the need for special provisions to address leakage concerns require the ability to adjust these measures in the context of the existing regulatory framework of the EU ETS.

## ***VI. A simple and robust design of auctions within the EU ETS can be implemented***

The introduction of large allowance auctions is not a highly complicated issue for the EU ETS. The fundamental structure of the scheme enables a robust and simple design of auctions. The large coverage of the scheme in terms of regions, sectors and participants limits the problems that could develop regarding collusion and/or market manipulation. A move from free allocation to auctions improves market performance by increasing liquidity in spot and hedging markets and reduces the incentives for market manipulation. The ongoing EU ETS allowance with publicly quoted prices avoids any need for complex auction designs and also ensures that auctions do not interrupt the continuity of the market.

The analysis on appropriate auction designs for the EU ETS suggested that single round, sealed bid auctions with a uniform market-clearing price would be most effective. To ensure the transparency and reliability of the market, the frequency of auctions should be high (at least monthly) and the distribution of allowances to be auctioned over time should be clearly defined and announced in advance by the relevant authorities. No serious argument was identified to limit the eligibility for the participation in auctions beyond the registry account holders within the EU ETS. European harmonization is a crucial issue for the phase-in of auctions at a large scale within the EU ETS. However, different options exist for formal and informal coordination of EU ETS auctions. These must be explored in more detail, especially to take into account political and legal constraints.

The concerns of strategic behaviour and exercising of market power are relevant in all markets, and therefore should also be considered in emissions trading schemes. A market monitoring mechanism for allowance trading, like in other commodity markets, will be necessary and useful to improve the market transparency and to limit concerns on the abuse of market power or collusion. Auctioning will contribute to better market performance by increasing liquidity of trading and hedging activities, and by reducing the ability of market participants to exercise market power in order to alter the value of grandfathered allowances in spot markets.

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