



# AUCTIONING

## Auctioning of Emission Allowances in Germany: Evaluation and background of five years' sales and auctioning upon transition to the third trading period of the EU Emissions Trading System

## **IMPRINT**

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## SUMMARY

Since its introduction, the European Union Emissions Trading System (EU-ETS) is the central instrument of the climate policy within the European Union (EU) and currently covers around 40 percent<sup>1</sup> of Europe's greenhouse gas emissions. For the third trading period, which will begin in 2013, the EU has adopted important changes to further increase the ecological effectiveness and economic efficiency of the EU-ETS. These efforts aim at significantly increasing the amount of emission allowances to be auctioned. This provides a long-term, clear and transparent framework for private investment decisions for facilities within the EU-ETS. In addition, allocation by means of auctions corresponds to the polluter pays principle and thus lays the foundation for integrating climate costs into business decisions. At the same time the auction proceeds gained open up new opportunities for public support of climate protection measures. The European share of auctioned allowances will rise from about 3 percent today to an estimated 50 percent of the allocated amount („cap“). Thus, auctions are becoming the basic principle of allocation in EU-ETS.

In the current second trading period, the allowances are still largely allocated to operators free of charge and based on benchmarks. The companies must receive at least 90 percent of the allowances free of charge from the Member States. Auctioning is currently rather tightly restricted. Germany has largely exhausted the potential sales volume and, with an annual sales volume of more than 40 million allowances, has adopted a pioneering role within the EU since early 2008. The sales volume is mainly the result of a reduced free allocation to electricity-generating installations. In addition to investment disincentives in the electric energy industry, so-called „windfall profits“, or opportunity gains, can be reduced (see Section 1.2)<sup>2</sup>. The entire auctioning procedure will become compulsory for electricity producers participating in the EU ETS in all Member States from 2013.

In implementation of the scheme, Germany has consistently relied from the beginning on existing and then newly emerging infrastructures of the carbon market. KfW sales running to the end of 2009 were used to gain experience in the use of this infrastructure with emissions trading exchanges at its centre. Since early 2010, allowances have been auctioned twice a week by KfW at the European Energy Exchange (EEX) in Leipzig. As the responsible authority, the German Emissions Trading Authority (DEHSt) at the Federal Environment Agency is responsible for the implementation of the auctions in Germany. The exchange-based auction approach is now being followed by most other Member States. Because of its cost and safety benefits, auctioning has also gained acceptance as the standard allocation method for the third trading period.

Overall, expectations regarding the process have so far been fully met: only one auction had to be postponed from among the more than 230 auctions planned in the reporting period. In addition, the relevant regulatory bodies did not find any case of abusive bidder behaviour throughout the reporting period that was aimed at distortion of the clearing price. The deviations of the clearing prices from the lead markets were mainly in the range of parts per thousand. Thus, the auctions were nearly synchronously carried out to the development of the overall market.

Even exchange members with access to the EEX can participate without additional technical effort and without additional fixed costs at the weekly auctions. This mainly concerns electric energy producers and intermediaries in the second trading period. For the third trading period, a special access was established for small and medium-sized enterprises (SMEs) at the EEX, which, in its simplest form, allows participation in the auctions completely free of charge. Fees are only incurred for emission allowances actually auctioned, and they are currently a maximum of 0.3 cent per allowance. If a party intends to purchase, say 10,000 tonnes a year, this costs just €30. In Germany – apart from KfW fees in its capacity as vendor of certificates at the exchange – there are barely any auction costs, as no significant additional structures were necessary for their implementation.

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1 EEA 04/2011: Greenhouse gas emission trends and projections in Europe, p. 80

2 If the market value of free emission allowances is reflected in the price of the product according to the so-called „opportunity cost principle“, so-called „windfall profits“ thereby result in the companies.

This report evaluates the experience and background of five years' sales and auction of emission allowances in Germany. It should be noted at the transition to the third trading period that the guidelines of Germany's approach directly adhere to the harmonised European auction framework. A look back provides also answers to the question about the new role of auctioning in the EU-ETS.

## 1 INTRODUCTION

### 1.1 OVERVIEW OF EUROPEAN EMISSIONS TRADING

Since its introduction as the first transboundary emissions market in early 2005, the EU-ETS has been one of the central pillars of European and German climate protection policy. Meanwhile, the EU-ETS has become the world's largest emission rights market. It accounts for more than 90 percent of global trade volumes.<sup>3</sup> It includes more than 12,000 installations in 10 different sectors from 30 countries (EU27, Liechtenstein, Iceland and Norway). Participants in the scheme are operators of stationary facilities in the manufacturing sector and the energy industry, and aircraft operators whose flights start or land in the EU. The plants included and the sectors newly added to the EU-ETS from 2013 cause about 40 percent of the EU's greenhouse gas emissions.

The EU-ETS is a market-based instrument and works on the principle of „cap and trade“: first, the amount of allowable greenhouse gas emissions is limited by a „cap“ for all of the installations included. The specified amount is then divided into the appropriate number of allowances, whereby one allowance permits the discharge of one tonne of CO<sub>2</sub> equivalent. These allowances can be freely traded among the companies („trade“). The allowances can either be allocated to the participating businesses by the state for free or offered for sale. The specification of a cap guarantees that the policy directed reduction targets for greenhouse gas emissions will be achieved in each case. At the end of the year, the companies must surrender to the state an amount of emission allowances equal to the exact amount of their greenhouse gas emissions in this period.

On the market, a price determined by supply and demand for greenhouse gas emissions develops due to the free transferability of rights. This creates an economic incentive to reduce emissions of greenhouse gases where it is most economically efficient. If the system operator reaches his reduction targets by his own cost-efficient measures, he can sell unused allowances on the market. Economically, this is of interest when one's own mitigation measure per tonne of CO<sub>2</sub> is cheaper than the market price for the emission of one tonne of CO<sub>2</sub>. Alternatively, the installation operator can buy allowances on the market if his own mitigation measures would be more expensive in comparison. Emissions trading is thus at the same time an environmentally effective and economically efficient climate protection instrument since it minimises the overall economic cost of achieving the target. Key elements of the EU-ETS are the successive allocation or trading periods. The subdivision into multi-year trading periods serves primarily to balance economic and weather-related fluctuations and the creation of longer-term investment security.

- **First trading period (2005-2007):** The first trading period covered the years 2005 to 2007 and, as a pilot phase, served the development in particular of institutional and in-house infrastructures necessary for emissions trading. In the first trading period, the allocation of emission allowances to installations subject to emissions trading was almost completely free of charge and was based on historical emissions. The trading period was also characterised by an oversupply of emissions allowances to participants, as the total amount distributed was mainly due to inaccurate data on actual emissions from the installation operators. This was also reflected in the price decline at the end of the period.
- **Second trading period (2008-2012):** The current second trading period covers the years 2008 to 2012 and corresponds to the first commitment period of the Kyoto Protocol. In addition to more ambitious caps on greenhouse gas emissions, the allocation rules, according to which the Member States issue allowances to companies, have been further harmonised. Furthermore, Member States are free in this phase to sell up to 10 percent of their annual quota of emission allowances (by sale or auction); that is, not to allocate them to installation

3 World Bank: State and Trends of the Carbon Market 2012



operators free of charge. In the current trading period a great increase in trading activity can also be observed between the companies involved in a developing carbon market. In contrast to the first trading period, it is possible to transfer emission allowances („banking“) from the second to the third trading period.

- **Third trading period (2013-2020):** For the third trading period starting in 2013, the Member States of the EU resolved far-reaching changes with the aim of further increasing the effectiveness and efficiency of the EU-ETS. Instead of the 27 national emission caps so far, there will be one single, EU-wide cap for the installations subject to emissions trading. By 2020, greenhouse gas emissions in the EU-ETS will be gradually reduced by 21 percent over 2005. In addition, new activities and other greenhouse gases and sectors will be covered, and the chemical industry will have to surrender allowances for its carbon dioxide and nitrous oxide emissions as of 2013. Aviation has already been integrated into the emissions trading system since 2012. Auctions will be established as a basic principle for allocation of emission allowances to installations subject to emissions trading in the future. The European share of auctioned allowances will rise from its current roughly 3 percent to an estimated 50 percent of the cap. Free allocations will only occur sporadically and not for all installations. They will occur on the basis of sophisticated, EU-wide standardised benchmarks, namely efficiency standards for a particular product. Inefficient producers of a particular product will have to buy far more emission allowances on the market in the future than efficient ones. For electricity production, the amount of emission allowances required must be fully auctioned or bought on the market. In aviation, 15 percent of the separate aviation cap will be always auctioned.

#### **Info Box: The European Union Emissions Trading System (“EU-ETS“)**

Since its introduction, emissions trading is the central instrument of climate policy in the EU, covering a total of about 40 percent of Europe’s greenhouse gas emissions. Emissions trading works on the principle of „cap and trade“. The reduction target for greenhouse gas emissions will be safely achieved by the emissions „cap“. The trading of emission allowances creates economic incentives at the company level to reduce emissions of harmful greenhouse gases where it is most economically efficient.

For the third trading period beginning in 2013, the EU has adopted important changes to further increase the ecological effectiveness and economic efficiency of the EU-ETS. Overall, facilities subject to emissions trading must reduce their greenhouse gas emissions by 21 percent by 2020 (over 2005). A free allocation will only be made in the future on the basis of sophisticated, EU-wide standardised benchmarks. In addition, auctioning will be the new basic principle of allocation. The European share of auctioned allowances will increase from 3 percent today to an estimated 50 percent of the cap.

## **1.2 WHY AUCTIONING AS AN ALLOCATION INSTRUMENT?**

Emission allowances were allocated to installation operators in the first EU-ETS trading period in almost all Member States free of charge. In the current second trading period, free allocation is replaced only to a relatively small extent by sale or auction. In addition to Germany, the United Kingdom, the Netherlands, Austria, Norway, Greece, Lithuania, Hungary and Ireland also sell emission allowances.

Measured against a total allocation of approximately 452 million allowances per year, Germany has taken on a pioneering role within the EU with its annual auction volume of more than 40 million allowances. European regulations currently prevent auctioning from playing a more extensive role as an allocation instrument. Auctioning will only become the guiding principle of allocation after the beginning of the third trading period. In particular, power producers will no longer receive free allocations from 2013. In other sectors, full auctioning will be phased in by 2027. This gradual increase in the importance of auctions compared to free allocation will improve the ecological and economic control function of emissions trading and prevent „windfall profits“.

### 1.2.1 Transparent and equitable framework for investment decisions

A key element of the EU-ETS are the subsequent trading periods. The specific conditions for the free allocation were subject to constant and sometimes drastic changes. From a business perspective, the variety of possible allocation and implementation options for future allocation periods represented an uncertainty factor for investment decisions:

- A lack of investment incentives can be caused by the fact that, at the beginning of a trading period, the level of the individual free allocation for an operator subject to emissions trading, is usually based on his past behaviour (emission or production levels). As a result, companies will potentially implement less reduction measures, because allocations are based on updated baseline emissions.
- The free allocation for new installations and capacity expansions can create the wrong incentives for investment, because economically, these are subsidies for new capacity.
- If the allocations are differentiated by fuel or technology, they may in part reduce the incentive to choose the lowest emission technology.
- Even for non-differentiated allocations, radical innovation installations or products are disadvantaged. If they do not produce emissions, and therefore are not subject to emissions trading, they will not receive a free allocation, which could be sold on the market.
- In addition, the free allocation of emission allowances is removed from the price formation process to the extent that companies, for various reasons, might not offer their surplus allowances, but hold them back. Therefore, the pricing formation on the market is – in contrast to full auctioning – distorted.

The described mechanisms are an obstacle to structural change towards new, lower-emission and energy efficient technologies. In contrast, the auctions create a long-term, transparent and non-discriminatory framework for private investment decisions, since only future production-related emissions and the allowance price formed by the market are relevant to the company's costs. An undistorted and long-term CO<sub>2</sub> pricing signal, which is created within the framework of auctioning emission allowances, will therefore lead to overall efficiency gains. Auctions, providing reliable pricing signals, support companies in their long-term planning and investments.

### 1.2.2 Avoiding „windfall profits“

Independently of the question whether and to what extent allowances are auctioned or allocated free of charge, emissions trading creates a price for emission allowances. For plain economic reasons, if possible, companies will try to pass on their costs of production to their customers via the sale price. This also applies to the costs of greenhouse gas emissions. From a company's perspective it is generally irrelevant whether the allowances were actually purchased or allocated free of charge by the state. From an economic perspective, the free allocation of emission allowances is therefore the same as a direct subsidy to the trading participants.

If the market value of free emission allowances is factored into the price of the product using the so-called „opportunity cost“ principle, the result will be so-called „windfall profits“ for the company. Power companies are especially accused of having transferred the allowances allocated free of charge as actual costs to consumers, to generate additional profits. However, these revenue increases are not offset by actual costs. Economically therefore, the returns from passing on mere opportunity costs represent a pure redistribution of wealth towards the benefit of the producers.

Auctions can prevent „windfall profits“, since the costs incurred in producing emissions actually exist for the operator. In addition, the state will generate revenue from the auctions, which it can use to promote national and international climate protection measures, as provided for in the emissions trading directive. In the context of fair sharing of burden in terms of the polluter pays principle, this fact should also be emphasised to support public acceptance of the EU-ETS.

### Info Box: why use auctions as an allocation tool?

Auctions create a long-term, well defined and transparent framework for efficient, private investment decisions in the EU-ETS. They comply with the polluter pays principle and thus lay the foundation for real structural change. When operators have to purchase allowances, their reduction measures will depend only on the cost of these measures.

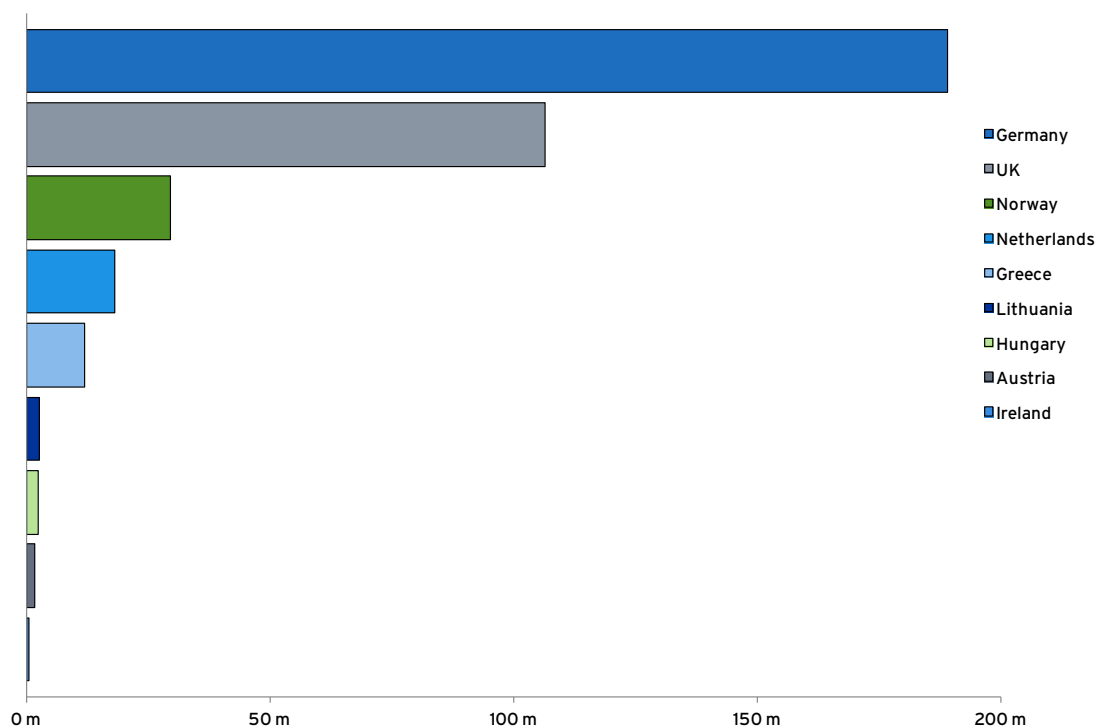
In addition, undesirable „windfall profits“ for participating companies can be avoided. The auction revenues also open up new opportunities for public funding of climate protection measures. In Germany, a large portion of the proceeds from the current trading period has already been applied to national and international climate protection projects as part of the climate change initiatives (see Section 2.3.6).

Economists therefore also talk about a double dividend of emissions trading auctions. As shown in this report, auctioning on existing emissions trading exchanges is also a very cost-effective and reliable allocation tool.

## 1.3 EUROPEAN OVERVIEW: SALES IN THE SECOND TRADING PERIOD

In the current second trading period of the EU-ETS, the allocation of allowances to operators is essentially free of charge. As required by the EU Emissions Trading Directive (Directive 2003/87/EC), between 2008-2012 companies must be allocated at least 90 percent of allowances free of charge from the Member States. Selling is therefore currently very restricted in the EU-ETS. In this context, it is up to the individual Member States whether and to what extent they consider paid allocation in their national allocation plans (NAPs).

Indeed, in the current trading period only a handful of states participating in the EU-ETS opted to sell allocations. In addition to Germany, these are the United Kingdom, the Netherlands, Austria, Norway, Greece, Lithuania, Hungary and Ireland. The following figures provide an overview of the respective sales quantities from the beginning of the second trading period to the end of the first half of 2012. Out of over 360 million allowances sold EU-wide so far, around 52 percent were sold in Germany. The United Kingdom was second with about 30 percent.

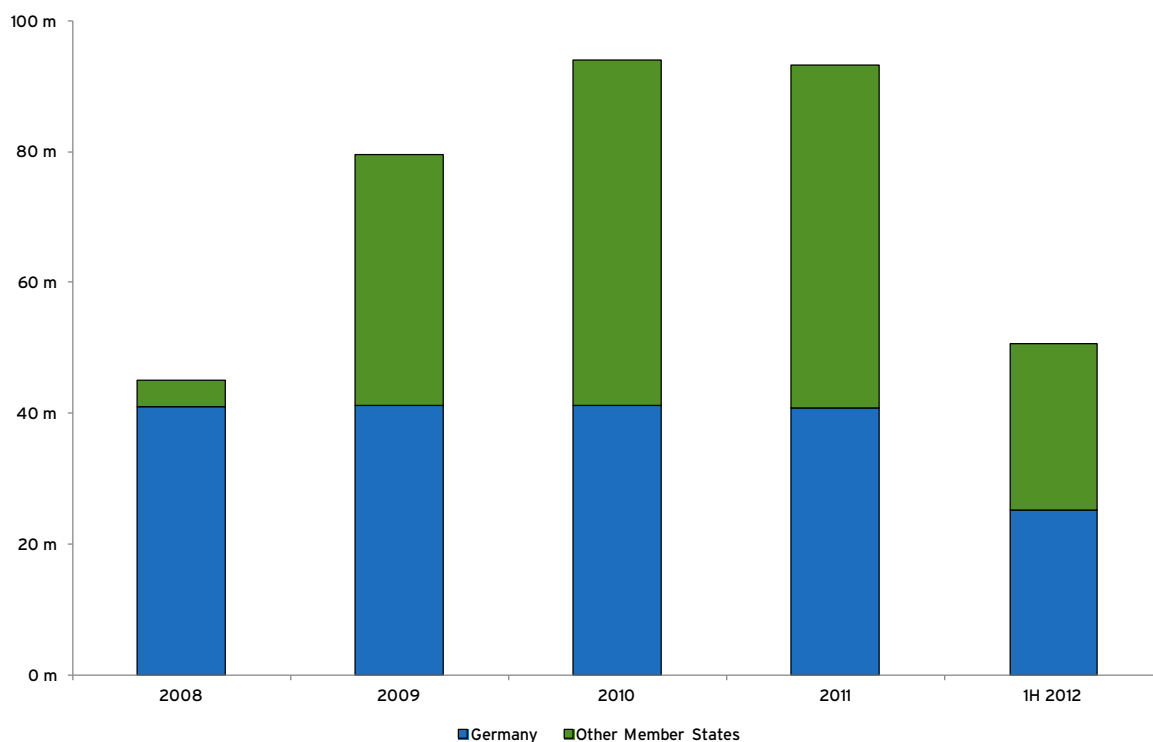


Source: EEA, COM, EEX, DEHSt

Figure 1: Allowances sold, by participating Member State (2008 to H1 2012) (m = million)

As is apparent from Figure 2, the distribution of the aggregate sale amounts vary significantly from year to year. Less than 50 million allowances were sold in the EU-ETS in the first year of the trading period. In 2009 the volume rose first to about 80 million and eventually to over 90 million allowances in 2010 and 2011. The final figure for 2012 is not yet known. The aggregate amount could be even higher than in previous years. This will depend primarily on the extent to which the Member States make use of the option to auction surplus allowances from the new entrant reserve (NER).<sup>4</sup>

During the first four years, German auction volume remained relatively constant at around 41 million allowances annually. From the beginning, this provided a high degree of transparency for all market participants. In other Member States, the sale amounts were sometimes distributed to the individual allocation years in different tranches, without knowledge of the exact splits at the beginning of the trading period.



Source: EEA, COM, EEX, DEHSt

Figure 2: Allowances sold per year, by participating Member State (2008 to H1 2012) (m = million)

In addition to the sales volume and distribution to the individual allocation years, the institutional and organisational sales approaches sometimes differed considerably. As early as 2008, Germany banked largely on the infrastructure of the, at that time, newly emerging carbon market, which in turn built on the existing infrastructure of other commodities. Because of its obvious benefits, the exchange-based auction approach is now also used by most other Member States. The following chapter will provide analysis and background on the development of this approach, which was established by Germany.

<sup>4</sup> In emissions trading, the term „new entrant reserve“ describes a certain amount of allowances which are held back for future plants (e.g. from industry). These can be transferred free of charge to such facilities in order to avoid a competitive disadvantage to existing plants with free allocations.

## 2 SALES AND AUCTIONS IN GERMANY (2008-2012)

### 2.1 OVERVIEW

Since the beginning of 2008, based on the German Allocation Act 2012 (ZuG 2012), Germany has been selling around 41 million emission allowances (EUA) annually. Among other things, the ZuG 2012 sets the national limits on greenhouse gas emissions of installations participating in the National Allocation Plan (NAP) for the current second trading period. Overall, the German Emissions Trading budget in the second trading period amounts to roughly 452 million EUA annually.

According to the ZuG 2012, of these 452 million EUAs, 40 million EUA (the „base amount“) have to be sold in each year of the second trading period. In addition to this base amount, additional EUAs from the national new entrant reserve are sold. This will cover the costs incurred by the Federal Government from the implementation of emissions trading („refinancing amount“). In the first four years of the trading period, the base and refinancing volume amounted to about 41 million EUA („total amount“) respectively. For the current year the total amount will be higher than that for the first time, because of increased financing requirement and the relatively low prices.<sup>5</sup>

Germany thereby largely exhausts the EU legislative framework for selling in the current trading period (see Section 1.3). The sales volume in Germany is achieved mainly by a proportionate reduction of the free allocation for electricity-generating installations. This measure specifically targets the reduction of so-called „windfall profits“ among power companies (see Section 1.2).

In addition to the annual volume, the ZuG 2012 also establishes the legal framework for the institutional and organisational implementation of sales in Germany. It specifies that the relevant amounts are to be allocated on the basis of an auction process from 2010 on, at the latest. Initially, from January 2008 to November 2009, selling was conducted on behalf of the federal government through daily trades by the KfW Bankengruppe (KfW) on the emissions trading exchanges in London (ICE) and Leipzig (EEX). These sales provided experience as to how the carbon market can support the government sale of EUAs. By conducting sales in a continuous trading environment, as opposed to an auction process, it was possible to flexibly respond to problems which developed within the still nascent infrastructure.

In accordance with statutory requirements, the trades have been replaced by an auction process since 2010. The details of the process are specified in the German Emissions Trading Auctioning Ordinance 2012 (EHVV 2012). Thanks to the positive experience from the trading years, emissions exchanges and their connected settlement systems („clearing and settlement“) also play a central role as auction platforms in the auctions. As early as 2009 the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) issued a call for tenders to appoint a platform. The tender was won by the Leipzig Energy Exchange EEX. From 2010 until the end of 2012, the annual sale volume is being auctioned weekly on the spot and futures market of the EEX.

As the competent authority, the German Emissions Trading Authority at the Federal Environment Agency (DEHSt) hired KfW, to take over the selling and settlement functions on the EEX. KfW is therefore responsible for placing the sales volume in the trading system and managing the required guarantees to the exchange. By using existing settlement and monitoring systems, DEHSt merely takes on a very limited monitoring role in the auctions. Since the auctions also take place on the electronic trading system of the EEX according to customary exchange rules, and because access is controlled, so-called „know your customer checks“ are conducted by EEX making the exchange linked auction a safe and cost efficient method. The exchange based approach successfully tested by Germany has also gained acceptance as the EU-wide standard for allocation for the third trading period in the EU-ETS (see Chapter 3).

The following table provides an overview of sales in the period from 2008 to 2012. It shows that during the reporting period some 190 million EUAs were sold for a total of over €2.82 billion.

<sup>5</sup> The legal basis for this is § 5(3) of the ZuG 2012, although the actual refinancing amount is calculated according to the requirements of § 2(4) EHVV 2012. According to that, 10 per cent of the funding requirement is covered by the proceeds from January through October. The partial refinancing amount allocated to a calendar month is calculated using the average auction clearing price for that month and 10 percent of the funding requirement.

Table 1: Overview of sales

Year	Type	Sold amount	Average selling price*	Revenue
2008	Sale	41,005,000	€23.16	€949,510,950
2009	Sale	41,125,000	€13.22	€543,544,744
2010	Auction	41,142,500	€14.36	€590,946,850
2011	Auction	40,675,500	€13.81	€561,569,835
H1 2012	Auction	25,090,000	€7.30	€183,079,100
<b>Total</b>		<b>189,038,000</b>	<b>€14.96</b>	<b>€2,828,651,479</b>

Source: EEX, DEHSt

\* Volume-weighted average

Government sales in Germany were carried out in the form of sales or auctions, each on the basis of spot and futures contracts. The majority was sold on the futures market because it has significantly greater liquidity. Sales were limited to „front-year” futures, which are common in secondary trading (see Section 4.2.5).

In all five years, the deviations of the average realised selling prices from the trading prices of the leading markets were marginal, regardless of the selling mode. The effects of Germany's primary market activity on the overall market were also negligible. A detailed presentation on the relationship between primary and secondary markets is outlined in the following sections.

Of the total of 189.038 million EUAs sold for a total of over €2.82 billion (average revenue per EUA €14.96), 138.777 million, or approximately 75 percent were sold as futures or auctioned. At an average price of €15.76 per EUA, revenue on the futures market therefore amounted to a total of €2.18 billion. The remaining 50.261 million allowances worth a total of €641 million were sold on the spot market. Table 2 summarises the results for the reporting period, separated by futures and spot markets.

Table 2: Overview of sales revenue by futures and spot market

Year	Contract	Type	Sold amount	Selling price*	Revenue
2008	Spot	Sale	0	-	-
	Futures	Sale	41,005,000	€23.16	€949,510,950
2009	Spot	Sale	9,963,000	€13.77	€137,171,354
	Futures	Sale	31,162,000	€13.04	€406,373,390
2010	Spot	Auction	16,632,500	€14.33	€238,304,950
	Futures	Auction	24,510,000	€14.39	€352,641,900
2011	Spot	Auction	16,165,500	€13.12	€212,148,435
	Futures	Auction	24,510,000	€14.26	€349,421,400
H1 2012	Spot	Auction	7,500,000	€7.17	€53,805,000
	Futures	Auction	17,590,000	€7.35	€129,274,100
<b>Spot</b>			<b>50,261,000</b>	<b>€12.76</b>	<b>€641,429,739</b>
<b>Future</b>			<b>138,777,000</b>	<b>€15.76</b>	<b>€2,187,221,740</b>
<b>Total</b>			<b>189,038,000</b>	<b>€14.96</b>	<b>€2,828,651,479</b>

Source: EEX, DEHSt

\* Volume-weighted average

### Info Box: Sale and auction in Germany

Since early 2008, Germany has been selling some 41 million emission allowances (EUA) annually, thereby largely exhausting the framework set by the EU for sales in the current trading period. The sale amount was achieved mainly through a reduction of the free allocation for electricity-generating installations. This measure can help reduce „windfall profits“ and counterproductive investment incentives. From 2013 onwards, electricity producers in the EU-ETS must purchase all of their emission allowances by auction.

From the very beginning, Germany banked on the, at the time, newly emerging infrastructure of the market for emission allowances. The KfW sales ongoing until the end of 2009 served the purpose of gaining experience in the flexible use of emissions trading exchanges. Since early 2010, allowances are auctioned twice a week on the European Energy Exchange (EEX) in Leipzig.

The exchange-based auction approach has now been adopted by most other Member States. Because of its cost and security benefits, it has also gained acceptance as a standard allocation method for the third trading period. As the competent authority, the DEHSt is responsible for the implementation of the German auctions.

## 2.2 PILOT PHASE - MARKET CONSERVING SALES BY THE KfW (2008-2009)

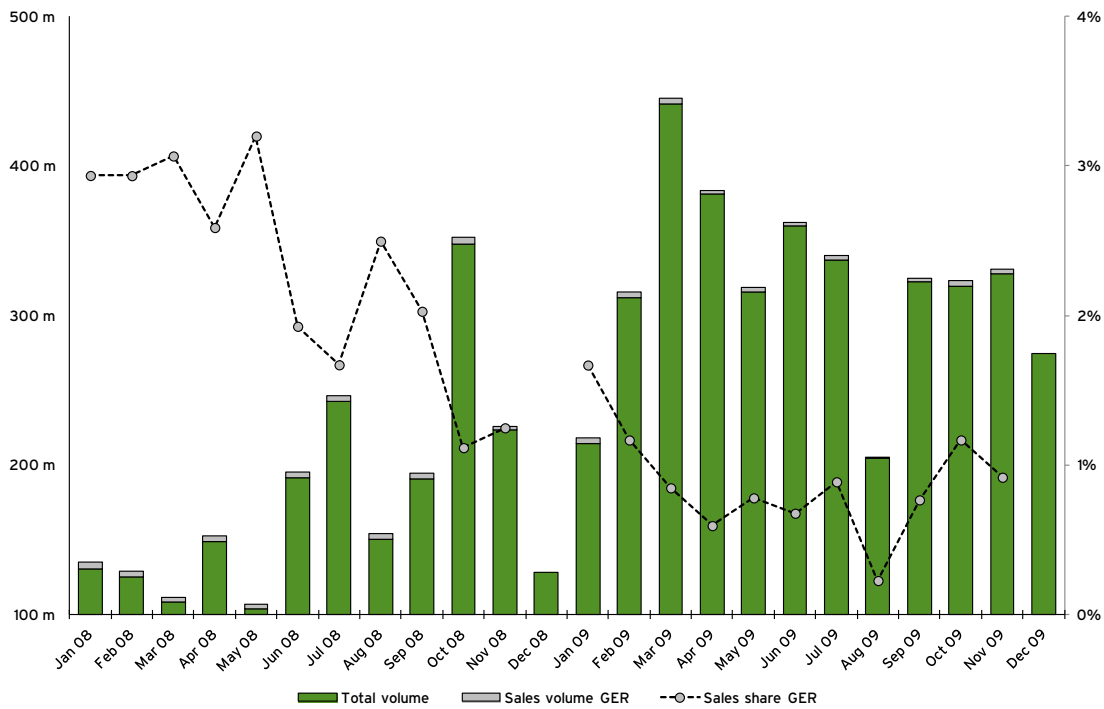
Since the European Emissions Trading Registry was not yet connected to the international UN-Registry at the beginning of the second trading period, the planned spot trading sales had to be delayed at first. Sales in the futures market had however been possible from January 2008 on because of the late settlement date of the futures contract (see Section 4.2.5). The annual volume planned for 2008 was therefore sold entirely on the futures market.

According to the statutory provisions of the ZuG 2012, the sales by KfW were supposed to be conducted in the most market-friendly fashion. In order to prevent market manipulation, KfW sold an average of 180,000 EUAs on each trading day, on the London ICE and the Leipzig EEX, distributed over smaller transactions between the minimum size of 500, and up to 40,000 EUAs. For the period from 2008 to 2009, a total of 10,000 individual transactions for the sale of 82 million EUAs were made.

In that fashion it was possible to evenly and reliably supply the markets with liquidity. In addition, the process offered high price transparency and enabled each participant in the EU-ETS to acquire allowances directly on the exchanges or indirectly through an intermediary of his choice (e.g. a commercial bank). The results were published monthly by KfW.

In Figures 3 and 4, the monthly sales volumes are expressed as a relative share of total trading volume of the relevant overall segment.<sup>6</sup> On the futures market, the relative volume share decreased from mid-2008, initially from around three, to less than two percent. With initial sales in the spot segment, and strong growth of secondary trading in futures contracts, the German share continued to decrease during the following year, finally to a level of less than one percent.

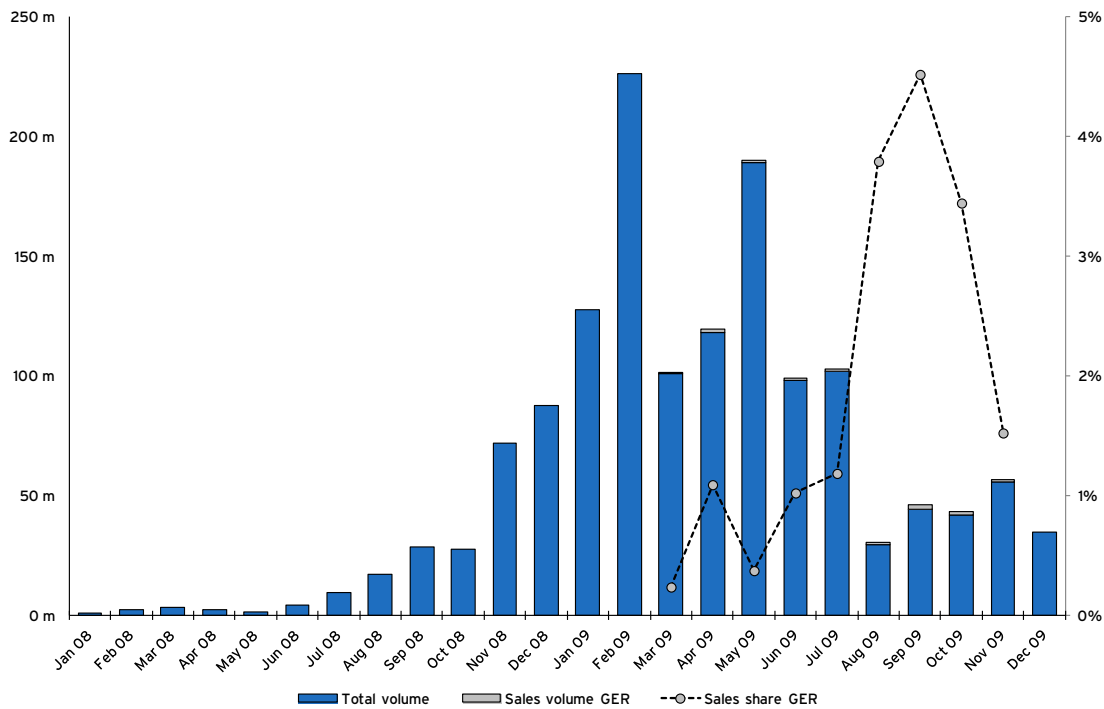
6 All emission allowances (EUAs) traded on the spot or futures markets on the ICE, GreenX, BlueNext and EEX are taken into account. Included are transactions that were completed directly on the exchange (screen traded) or, as bilateral transactions, have at least used the clearing mechanism of the exchange. Option contracts are not considered. Contracts sold by other EU Member States during the reporting period are also included.



Source: ICE, GreenX, EEX, BlueNext, KfW, DEHSt

Figure 3: Trading volume on the futures market and relative monthly share of the German KfW sales (futures) (m = million)

On the significantly less liquid spot market, smaller amounts were initially sold from the spring of 2009 – correspondingly, the percentage share reached a maximum of one percent until July of the same year. Only with the onset of strong trading declines (see Section 4.2.4) did the KfW share exceed four per cent for a short while.



Source: ICE, EEX, BlueNext, KfW, DEHSt

Figure 4: Trading volume on the spot market and the relative monthly share of the German KfW sales (spot) (m = million)

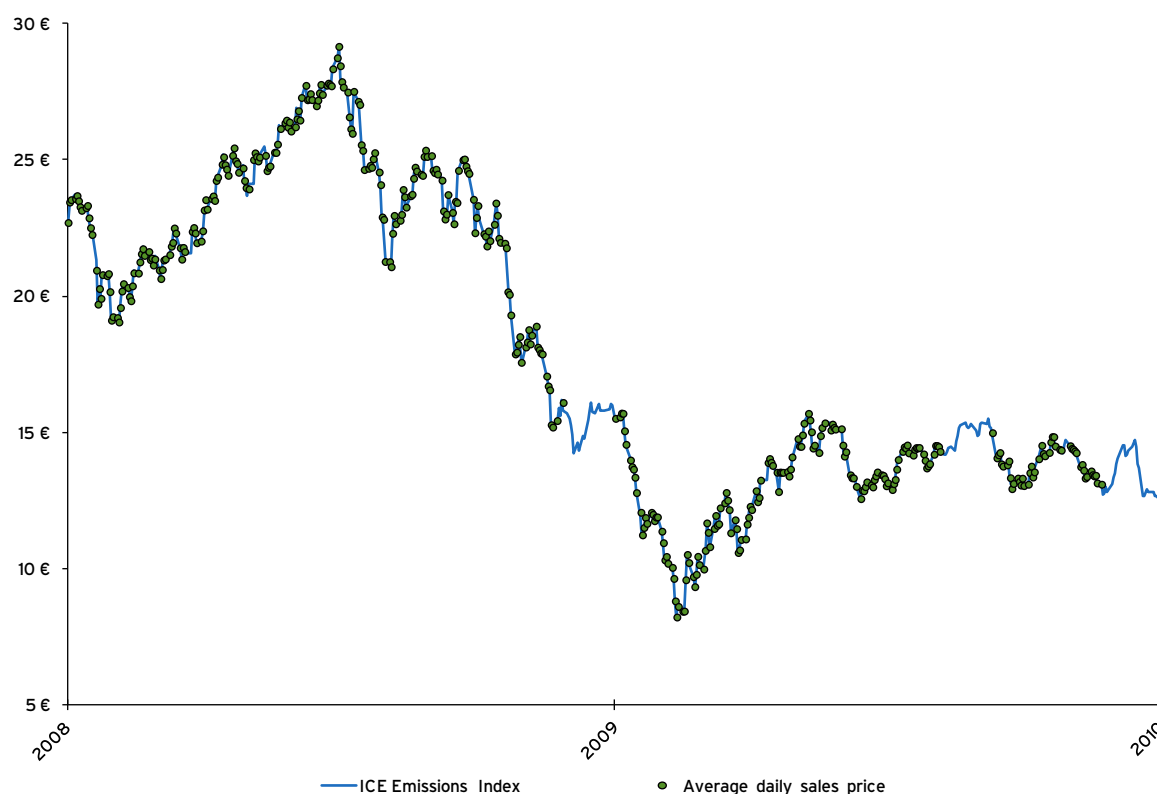


The ability to use an existing portfolio of trading products therefore emerged as a clear advantage especially in the first year of the trading period. Without this flexibility, the German sales would have had to have been suspended at times. In spring 2009, sales on the spot market began. Due to the higher liquidity of this contract, the futures were generally sold with a maturity in December of the current year. „Front-year” futures continue to be used in the auctions from 2010 onward.

## 2.2.1 Selling prices and the secondary market

To assess the sales results achieved, reference pricing of the relevant main exchanges in the secondary market is used. While the Paris-based BlueNext established itself as the most important trading centre in the spot market, the centre of the futures market is the ICE in London (see Chapter 4). As a useful measure for evaluating the sale prices achieved in futures selling, a price index published daily by ICE is used („ICE Emissions Index”<sup>7</sup>).

The following figure shows the plot of the KfW average daily sales price on the futures market and the graph of the ICE Emissions Index over the period 2008 to 2009. No sales were scheduled for December in either year as the annual total was fully sold by the end of November.



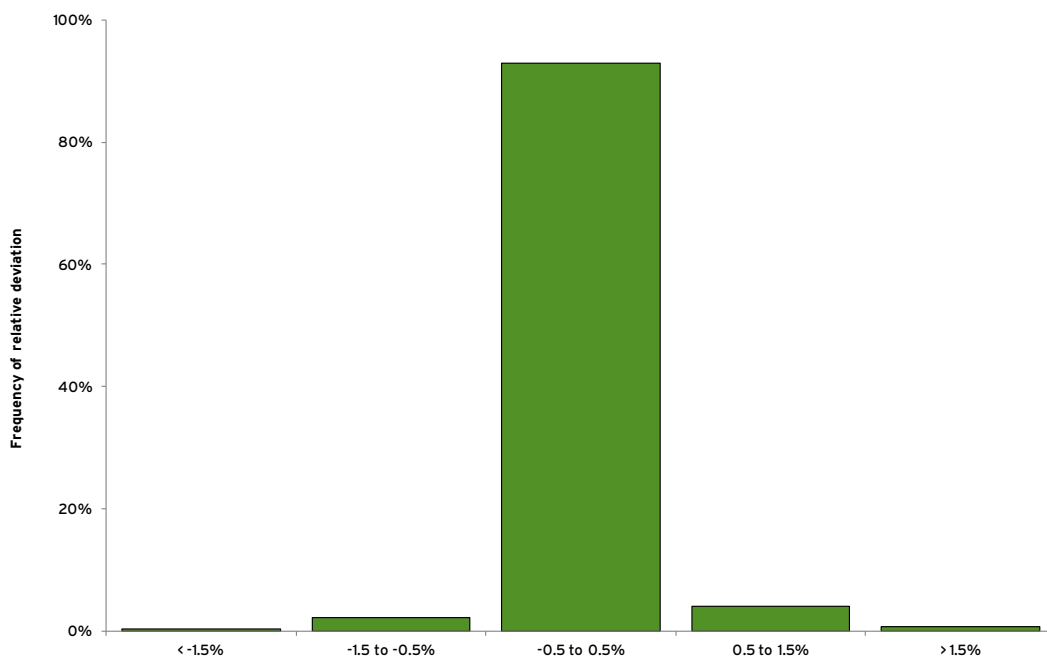
Source: ICE, KfW, DEHSt

Figure 5: Average KfW daily sales price and ICE Emissions Index (futures)

The sales price fluctuated from the ICE Emissions Index on a daily basis between -1.8 to 3.8 percent. However, for more than 90 percent of the trading days, the relative deviation was within the range of -0.5 to +0.5 percent (see Figure 6).

The sales on the futures market occurred almost wholly synchronously to the lead market in London. The figure below shows the relative frequencies of the daily deviations.

<sup>7</sup> [ICE-ECX European Emissions Index](#): The index is calculated from the volume-weighted prices within a trading day, making it a suitable indicator of the trend in the market segment observed.

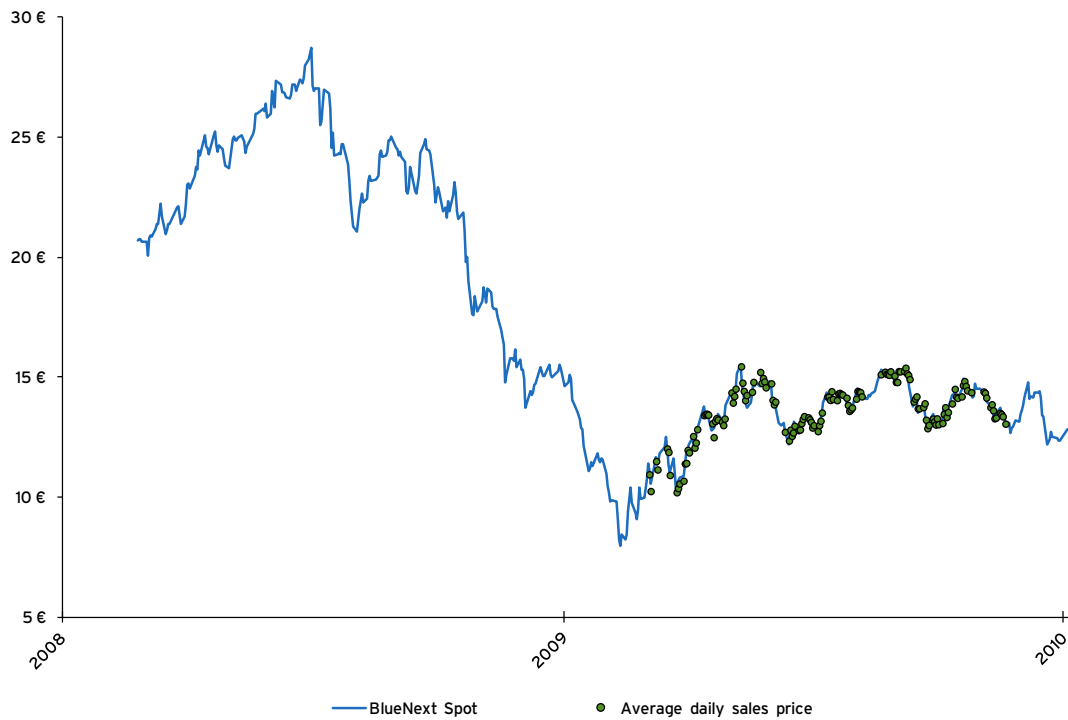


Source: ICE, KfW, DEHSt

**Figure 6: Frequency distribution of the relative deviation of the KfW sales price from ICE Emissions Index (futures)**

With sales on the spot market, the published official daily closing prices („settlement prices“<sup>8</sup>) at BlueNext are compared with the trade-weighted average price obtained by KfW for all transactions of the day. Because of the distribution of transactions over the day, a trade-weighted index of all stock exchange transactions performed on this day would certainly be a better price standard. However, no index published by an independent body for the spot market currently exists. Figure 7 illustrates the settlement prices on the lead market in Paris and the trade-weighted average prices of all KfW transactions.

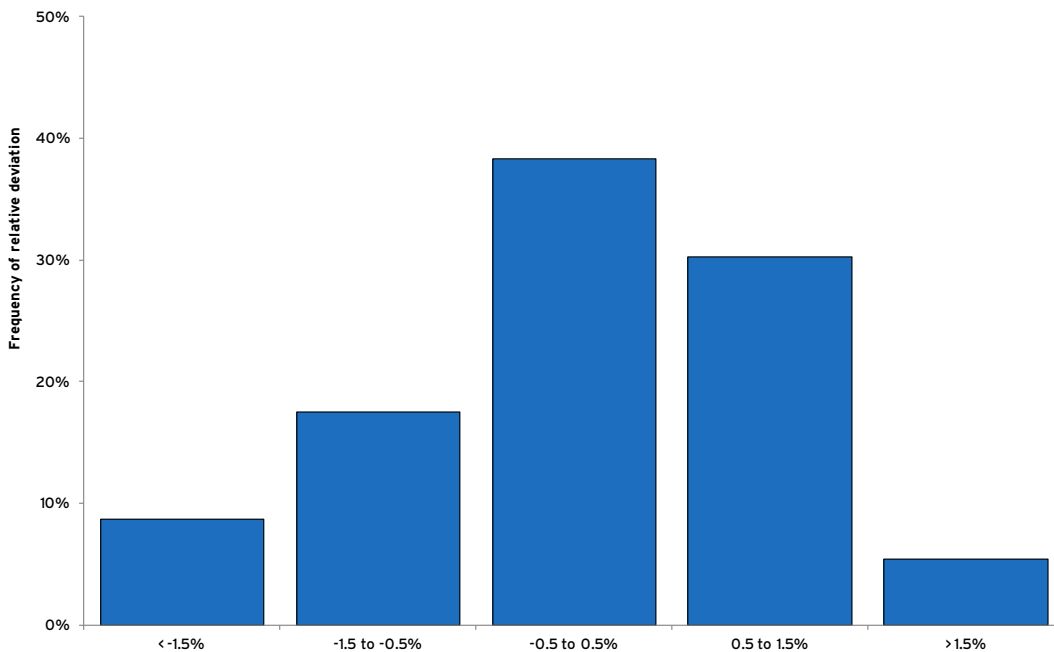
8 [BlueNext daily closing prices](#)



Source: BlueNext, KfW, DEHSt

Figure 7: Average daily KfW sales price and BlueNext settlement prices (spot)

When compared on a daily basis, the KfW sales price fluctuated more noticeably against the lead market in Paris than in the futures segment (see Figure 8). The reason for this was the difference between the average daily sales price and the settlement price that only reflects the trading activities at the end of the trading day.



Source: BlueNext, KfW, DEHSt

Figure 8: Frequency distribution of the relative deviation of the KfW sales price from the BlueNext settlement price (spot)

Overall, the previous analysis of price deviations and volume fractions do not allow any conclusions to be drawn which would indicate a significant influence of the market by the KfW sales.

## 2.3 „LESSONS LEARNT“ AND TRANSITION TO EXCHANGE-BASED AUCTIONS (2010-2012)

In accordance with the statutory requirements of ZuG 2012, sales were replaced by an auction procedure early in 2010. The positive experience from the sales on the emissions trading exchanges in London and Leipzig were also directly integrated into the concept of the auction design. Therefore, emissions trading exchanges with their connected clearing and settlement systems provide the auction platforms which are the key instruments of the auction procedure. The sales between 2008 and 2009 allow five particular conclusions to be drawn for the auction procedure:

1. **Efficient and reliable trading system:** The electronic trading systems of established exchanges have an almost one hundred percent availability and are tailored to the needs of market participants. Thanks to the system's flexibility, the auctions can be carried out without major modifications on the existing trading platforms.
2. **Efficient management and risk reduction:** The extensive infrastructure within the stock exchanges to reduce the risk of default and for settling transactions have proven extremely reliable and can also be fully utilised for auctions on the primary market (see Section 4.2.1).
3. **Efficient supervisory and control mechanisms:** The competence of the proven state and exchange-internal control and supervisory structures considerably reduces the possibility of strategic bidder activity within the auction procedure. This ensures the acceptance of the new market instrument by the trading participants.
4. **Efficient and needs-based approach:** In the second trading period, electricity producers predominantly purchased allowances. Many of these potential auction participants are already in the ETS and also actively participating directly in the exchanges of other market segments such as electricity or natural gas. The same applies to intermediaries such as, for example, commercial banks through which an indirect participation is also possible. Therefore, exchange-based auctioning generally does not cause significant additional costs to these companies. For the third trading period, specific adjustments for small and medium-sized enterprises (SMEs) will be implemented.
5. **Efficient pricing:** Due to the rapid growth in trade volume, emissions trading sends out a strong price signal. Thus, a complicated pricing can be avoided within the auction procedure. In view of this, the complexity of the auction design can be greatly reduced.

Consequently, the institutional and organisational structure of the German auction procedure is strictly based on the above findings in order to enable a cost-efficient, transparent and secure auction procedure. The detailed procedure is governed by the EU Auctioning Regulation. EEX was selected as the implementing stock exchange in a tender process. Since the auctions take place at the EEX as part of the regular stock exchange trading, the high safety standards of the supervisory and management structures common in stock exchanges can also be used in the auctions.

As the body responsible for the auction procedure, DEHSt regularly publishes evaluation reports in which they tell the public and market participants about the auction results.<sup>9</sup> The following Table 3 illustrates the most important figures of the German auctions differentiated according to spot and futures markets.

Table 3: Overview of auctions between 2010 and the first half of 2012

Contract	Dates	Bid volume	Auction volume	Cover ratio*	Clearing price*	Revenue
Spot	119	276,258,000	40,298,000	6.86	€12.51	€504,258,385
Futures	112	408,804,000	66,610,000	6.14	€12.48	€831,337,400
<b>Total</b>	<b>231</b>	<b>685,062,000</b>	<b>106,908,000</b>	<b>6.41</b>	<b>€12.49</b>	<b>€1,335,595,785</b>

Source: EEX, DEHSt

\* Volume-weighted average

Overall, the expectations toward the procedure have been fully satisfied up to today (see Table 4).

9 [DEHSt reports on auctioning of emission allowances in Germany](#)

Table 4: Evaluation of current auctions on the EEX

<b>Reliability</b>	Only one auction had to be postponed from among more than 230 auctions planned. This was due to an EU-wide prohibition of transactions in the European emissions trading registries (see Section 4.2.4).
<b>Security</b>	The relevant regulatory bodies did not find any case of abusive bidder behaviour throughout the reporting period that was directed at the distortion of the clearing price.  In addition, there were no payment defaults in the settlement of the auctions.
<b>Market protection and transparency</b>	The deviations of the clearing prices from the lead markets were mainly in the range of parts per thousand. Thus, the auctions were carried out almost synchronously in the development of the overall market.  Thanks to the fixed auction calendar, market participants can adjust to the German auctions early.
<b>Cost efficiency</b>	Exchange members with access to the EEX can participate in the weekly auctions without additional technical effort and without additional fixed cost. This mainly affected electric energy producers and intermediaries in the second trading period.  For the third trading period, a special access was established for SMEs which, in its simplest form, is free of charge. The fees for an auctioned emission allowance are currently a maximum of 0.3 cent.  The auctions cause hardly any costs to Germany as no additional structures were necessary for their implementation. Exchange fees are borne by the buyers.

### 2.3.1 The auction procedure

In order to guarantee above-board market activities free of manipulation, auctions are under continuous surveillance by an independent Market Surveillance Office (Handelsüberwachungsstelle, HÜSt) as required under the German Exchange Act (BörsG). The stock exchange and financial supervision is exercised by the competent Saxon State Ministry of Economy, Labour and Transport (Sächsische Staatsministerium für Wirtschaft, Arbeit und Verkehr, SMWA) and the Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht, BaFin) (see Section 4.2.2).

As the competent authority for the auction process, the DEHSt only needs to exert a limited monitoring role due to these existing surveillance systems. The DEHSt receives regular reports from the HÜSt on their monitoring activities and, in the case of irregularities can, together with the BMU, decide on possible countermeasures. Thus, for example, bid amounts per bidder can be limited to 100,000 allowances or other appropriate remedies against manipulative bidding patterns can be introduced by the DEHSt.

Auctions settlement is performed by the European Commodity Clearing AG (ECC) which is the EEX's clearing house. After the auctions, ECC as a central counterparty guarantees the fulfilment of transactions concluded between the Federal Republic and the successful bidders. The function of the vendor on behalf of the Federal Government is taken on by KfW which benefits from its experience as a stock exchange member during the sale years (2008-2009). As a clearing member, KfW is responsible for the daily management of collateral against the ECC described in Section 4.2.1 („initial margining“ and „variation margining“).

Dealing with auction products, spot and futures contracts are differentiated. Here they are restricted to „front-year futures“, both on the futures market and in sales by KfW, which are common on the secondary market (see Section 4.2.5). In order to provide trading participants with a constant participation in the auctions and at the same time minimise the potential impact of auctions on the secondary market, the allowances are offered once a week on separate occasions on the spot and futures markets.

In the years 2010 and 2011, the weekly auction amount was 870,000 EUA. The first increase to 945,000 EUA took place between January and May 2012. Since June 2012, a quantity of 1,150,000 EUAs has been auctioned every week. The distribution within the two auction segments can be seen from the following table.

Table 5: Distribution of weekly auction volumes (as of June 2012)

	Futures market	Spot market	Weekly total volume
	Wednesdays from 13:00 to 15:00 CET	Tuesdays from 09:00 to 11:00 CET	
January to October	850,000 EUA	300,000 EUA	1,150,000 EUA
From November	-	1,150,000 EUA	1,150,000 EUA

The uniform price procedure, which is common practice throughout the European Union, is used as the auction procedure. It involves one round of bidding and a closed order book. This simple and robust procedure protects against market manipulation and will continue to be used during the third trading period and for aviation. The following figure illustrates the described pricing method using an auction on the spot market as an example.

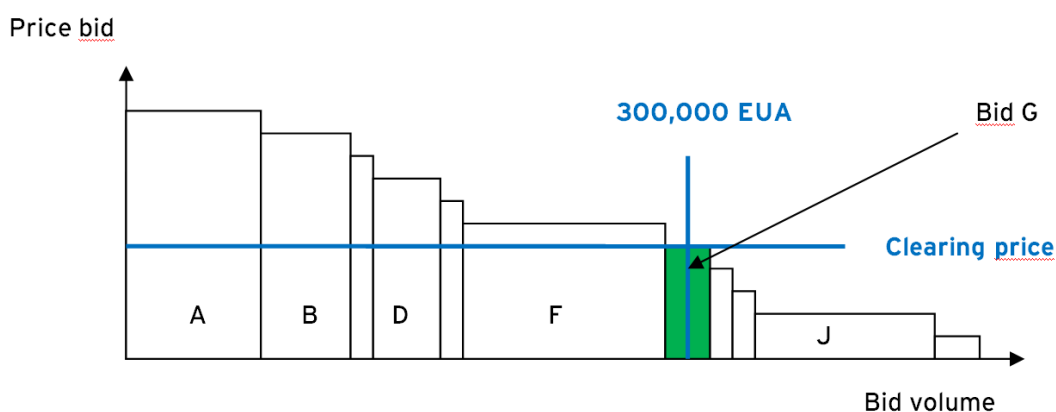


Figure 9: Example for the award of contracts using the uniform price method

The uniform price procedure means that all successful bidders pay the same price. The auction clearing price is determined by ranking all eligible bids according to the bidding price. In the event of equal bids, the bids are additionally ranked according to the time they were entered beginning with the earliest bid ("first come first served principle"). The bid volumes are aggregated starting with the highest bid until the volume of emission allowances on offer is reached (300,000 in the example). The bid price at which the aggregate volume of bids reaches or exceeds the offered volume of auctioned allowances determines the auction clearing price (bid G).

Bidders will thus be awarded their bid volume if their bidding price at least matches the auction clearing price. If a bid matches the clearing price exactly, the bidder may be awarded the remaining allowances which may be below the volume requested, depending on the bidding situation. This is the case in the above example since bid G exceeds the quantity available. If the bid from several participants matches the auction clearing price exactly, the above-mentioned „first come first served“ principle applies.

### 2.3.2 Conditions of participation

Weekly auctions of futures or spot contracts at EEX are part of regular exchange trading. Participation is possible either directly for EEX members or indirectly via a broker or as a client of an EEX member. A direct exchange membership is not necessarily required in order to participate in the auction. This ensures that small and medium-sized enterprises that have no trading department of their own can also benefit from participating in the auctions.

Exchange members with access to the EEX can participate without additional technical effort and without additional fixed costs at the weekly auctions. The approval for new members usually takes 6-7 weeks and depends on the relevant provisions of the German Exchange Act. For direct admission to trading on the EEX, companies etc. must have a liable equity capital of at least €50,000. In addition, electronic connection has to be set up to the trading system. An annual fee of €5,000 per market segment (spot or futures) is due for the simplest type of access. A licensed exchange trader is another prerequisite for maintaining an access to the trading system.

In particular, against the backdrop of a growing importance of auctions in the next trading period, the conditions for direct access were further adjusted to the specific needs of SMEs. Since early August this year, the participation in the primary market has also been possible via a so-called „auction-only“ access. This is governed by its relatively low requirements particularly for SMEs and is limited to participation in the auctions.<sup>10</sup> In addition to the above equity capital requirement, there is no need for an electronic connection to the trading system of EEX. The bids can be optionally sent by fax. In this case, the bid will be entered on behalf of the bidder via the EEX Market Supervision into the trading system. Due to the optional waiver of an electronic trading connection, auction-only participants do not necessarily have to have a licensed exchange trader. An annual fee for this access variant via the EEX Market Supervision does not apply. In the case of an auction-only access with an electronic connection, a reduced annual fee of €1.200 only needs to be paid.

Regardless of the chosen access, all successful bidders pay the same transaction fees for the settlement of transactions. Auctioned emission allowances cost 0.3 cents each for spots and 0.28 cents each for futures. Surrendering, cancelling or changing bids is basically free of charge. Transaction fees are only charged for actual auctioned allowances. The following table displays the fees for a direct participation in the auctions on the EEX.

Table 6: Fees according to access type

	Auction only (primary market)		Primary and secondary market (combined)
	Bidding per fax	Bidding in trading system	
Annual fee (new customer)	0 Euro	(Spot) €1,200	(Spot) €5,000 (Futures) €5,000
Transaction fee (per EUA)	(Spot) 0.3 cent and (Futures) 0.28 cent		

Source: EEX (as of 01.08.2012)

### Info Box: Participation, Deadlines and Procedure

Weekly auctions of futures or spot contracts at EEX are part of normal exchange trading. Participation is possible either directly for EEX members or indirectly via a broker or as a client of an EEX member. This ensures that small and medium-sized enterprises that have no dedicated trading department can also benefit from the auctions. Exchange members already admitted to emissions trading on the EEX can participate in the weekly auctions at no cost or fixed charges. Participation via a so-called „auction-only“ access is possible since August 2012. This access is characterized by relatively low requirements and is thus aimed particularly for SMEs (see Section 2.3.2).

From 2010 to 2011, auctions were held on separate dates between January and October - 300,000 allowances for immediate delivery (spot contract) are auctioned every Tuesday and 570,000 allowances to be delivered by December (futures) are auctioned every Wednesday. In 2012, the weekly volume of futures contracts increased to 645,000 EUAs from January and to 850,000 EUAs from June. In 2010 and 2011, 870,000 allowances were auctioned weekly on the spot market from November. In 2012 this volume increases to 1,150,000 allowances. The exact auction dates are published in the respective [EEX Auction Calendar 2012](#).

The auction procedure is broadly laid down in the Ordinance on the Auctioning of Emission Allowances (Emissionshandels-Versteigerungsverordnung, EHVV 2012). A single-round, uniform-price procedure is applied at auctions. All successful bidders pay the same price. Auctions are conducted with a closed order book, and bidders can only see their own bids. The minimum bid size is 500 allowances in auctions on the spot market and 1,000 allowances in auctions on the futures market.

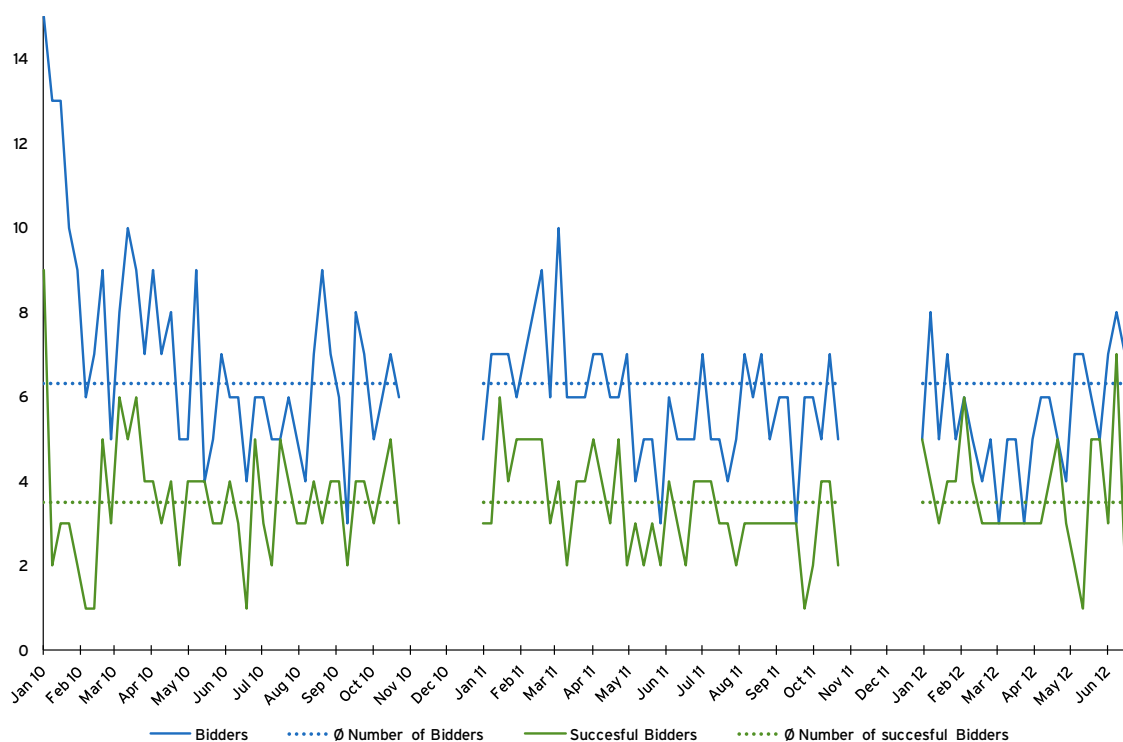
<sup>10</sup> Since the auctions are conducted only on the spot market in the third trading period, the „auction-only“ access is not designed for the futures segment.

### 2.3.3 Bidder participation

The total volume auctioned during the reporting period, which amounted to 190 million EUAs, went to 754 successful bidders. Of these bidders, 393 participated in the futures market and 361 in the spot market. The total number of bidders actively participating in the auctions during the reporting period was 1,414. From a bidder's perspective, the average success rate over all 231 auction dates was just over 50 percent. The average quantity awarded per successful bidder was approximately 112,000 allowances in spot auctions and approximately 170,000 allowances in futures auctions.

Since market participants can place bids on several dates, the number of participating and successful bidders does not necessarily equal the overall number of market participants who have participated in the auctions in the reporting period. Furthermore, the indirect participation of bidders via intermediaries – such as banks and financial services – is not reflected in the attendance figures mentioned. Only those market participants acting as intermediaries and thus directly participating in the auctions are included, but not the indirect bidders behind the intermediaries.

Figures 10 and 11 illustrate the structural evolution of the number of participants in the individual auctions of the spot and futures markets. In futures auctions, bidder participation fluctuated over the reporting period between 3-15 participants. But in more than 80 percent of the auctions, participation was stable between 4-8 bidders. The actual number of successful bidders ranged from 1-9 bidders, but concentrated in the range of 2 to 4 participants. As planned, in the months of November and December no auctions were held on the futures market.

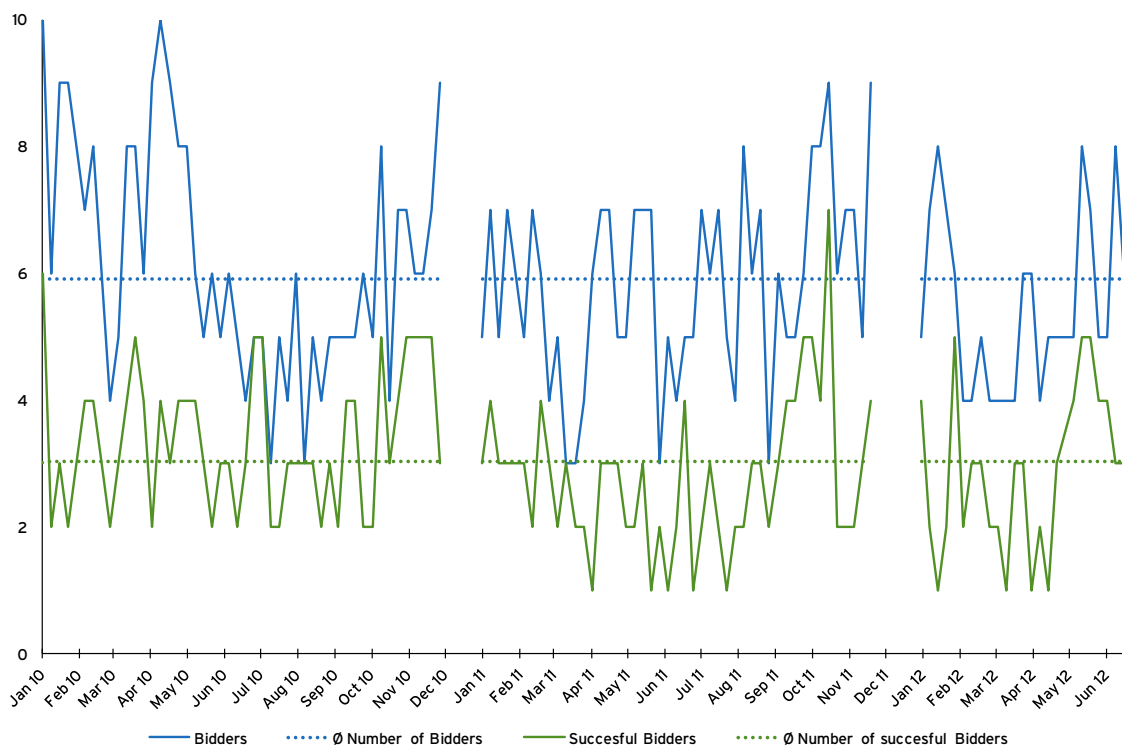


Source: EEX, DEHSt

Figure 10: Number of participating and successful bidders for each date (futures)

The level of participation in the spot auctions was comparable to the futures market. Only in exceptional cases did fewer than four bidders submit bids. Overall, participation was concentrated around the range of 4 to 8 bidders. The number of successful bidders was also usually in the range of 2 to 4 participants. As planned, at the end of November, auctions were suspended for the current year.





Source: EEX, DEHSt

Figure 11: Number of participating and successful bidders for each date (spot)

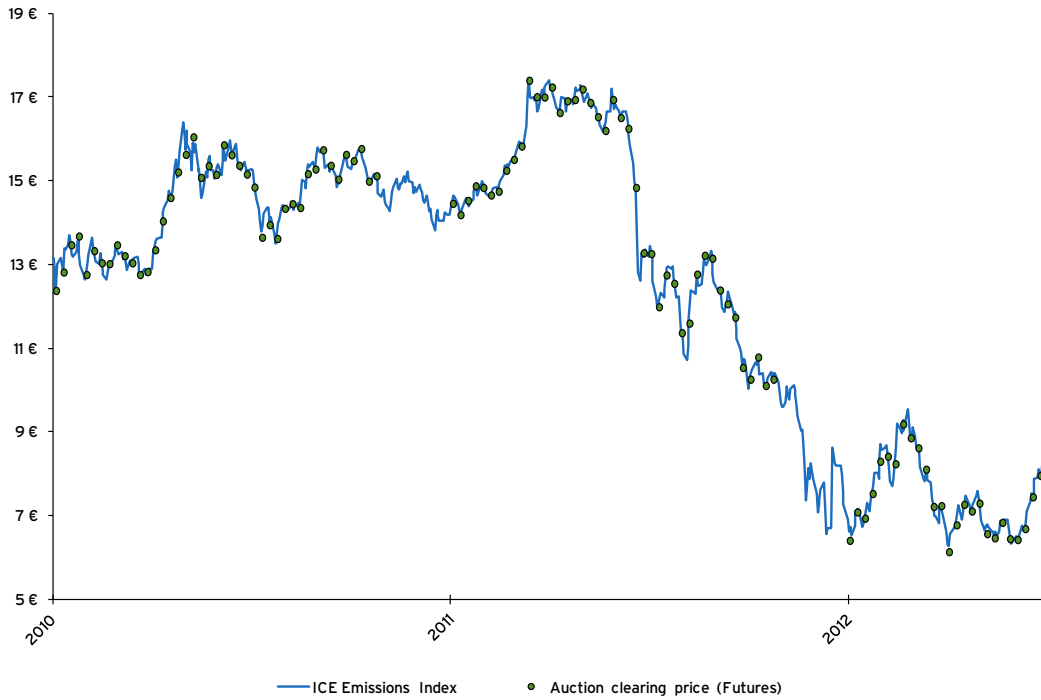
### 2.3.4 Auction prices in comparison to continuous trading

An analysis of the auction pricing shows a clear correlation between the auction price achieved and the respective prevailing market price. In a competitive market environment it seems that relatively few bidders are required in the auctions in order to achieve efficient and competitive prices. Firstly, there must be a sufficient number of potential bidders active on the market and secondly, there needs to be a sufficiently high aggregated demand in proportion to the amount offered. Apparently both conditions are fulfilled for the German auctions on the EEX. Essential to success is the weekly auction frequency on the spot and futures markets, as well as the most extensive use of established market structures.

Prices from the most liquid trade exchanges serve as benchmarks for further evaluation of the clearing prices. In keeping with the analysis of the sales prices, the Paris-based BlueNext is used for the spot market and the ICE in London for the futures market.

As a suitable benchmark for assessing the sales price of forward sales, the ICE Emissions Index is used. The following figure shows that throughout the entire auction period, the clearing prices of German futures auctions are synchronous with the development on the lead market.<sup>11</sup>

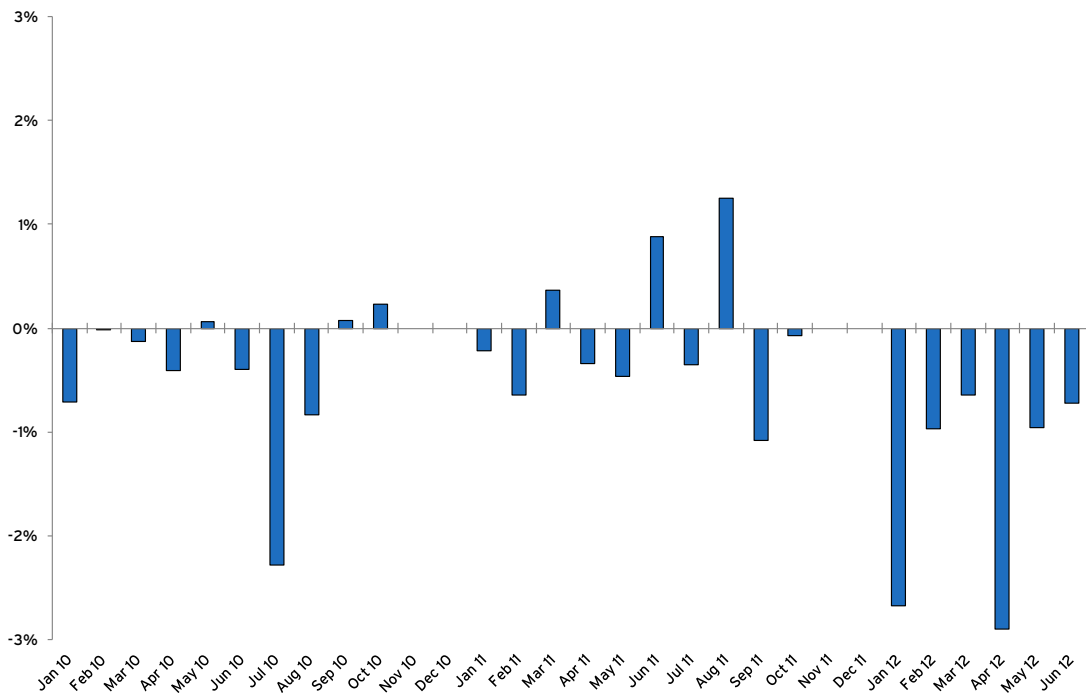
<sup>11</sup> In accordance with statutory requirements, futures auctions were suspended from November on, for the respective current calendar year.



Source: ICE, EEX, KfW, DEHSt

Figure 12: Clearing prices and ICE Emissions Index (futures)

In contrast to the weekly German futures market auctions there are a large number of individual transactions in continuous exchange trading. Figure 13 compares the average clearing prices per calendar month with the average trading price observed on the ICE over the same period. The benchmark used is the ICE Emissions Index. For a mean value analysis, the arithmetic mean of the individual price deviations during the reporting period is calculated. The average deviation of the average auction clearing price from the ICE Emissions Index was at around 0.7 percent in the reporting period.



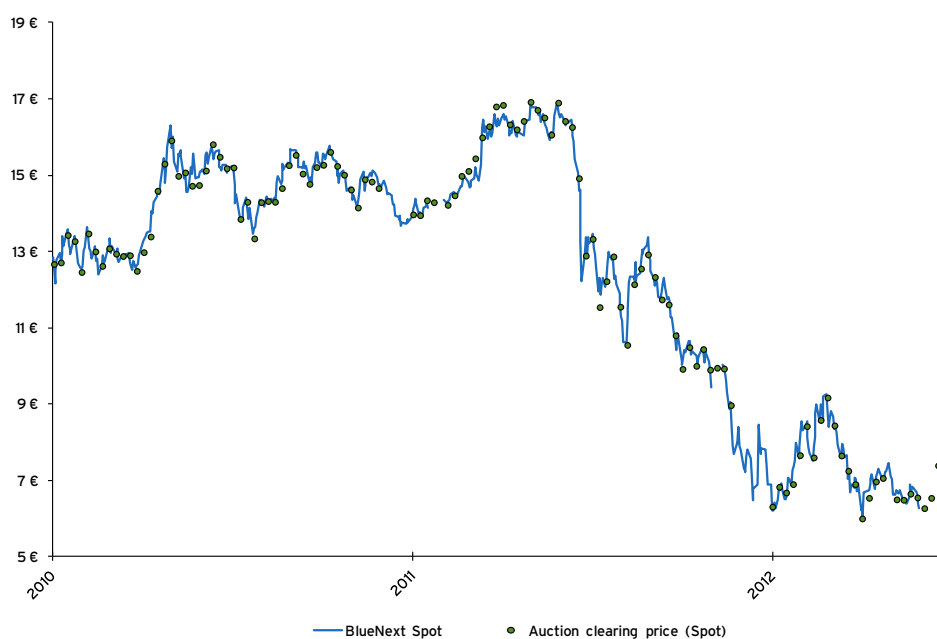
Source: ICE, EEX, KfW, DEHSt

Figure 13: Deviation of clearing prices from the ICE Emissions Index (futures)

From an economic perspective, it is remarkable that the clearing prices only deviate from the lead market by a few percentage points: the same average price was achieved at a rate of four or five futures auctions per month which evolved over the same period out of thousands of individual transactions on the market. This was all the more interesting because of the very volatile price dynamics over the reporting period (see Section 4.2.6). Two main conclusions can be drawn from this:

1. **From the perspective of a installation operator in need of additional allowances:** The medium- and long-term price trend on the emissions markets can be mirrored with a fair degree of accuracy by constant participation in the auctions. This is especially attractive for companies who want to avoid complex and therefore labour intensive trading strategies.
2. **From the perspective of the auctioning nation:** the risk of price deviations vis-à-vis the lead markets can be diminished significantly by a weekly auction rate. At the same time, the administrative effort compared to straight sales is lower.

For auctions on the spot market, the officially published settlement prices on BlueNext are used as a benchmark.<sup>12</sup> Analogous to the approach for the futures market, the following figure 14 illustrates the clearing prices of the German spot auctions and the benchmarks at the lead exchange. In this segment, the development also runs synchronously and without abnormalities.



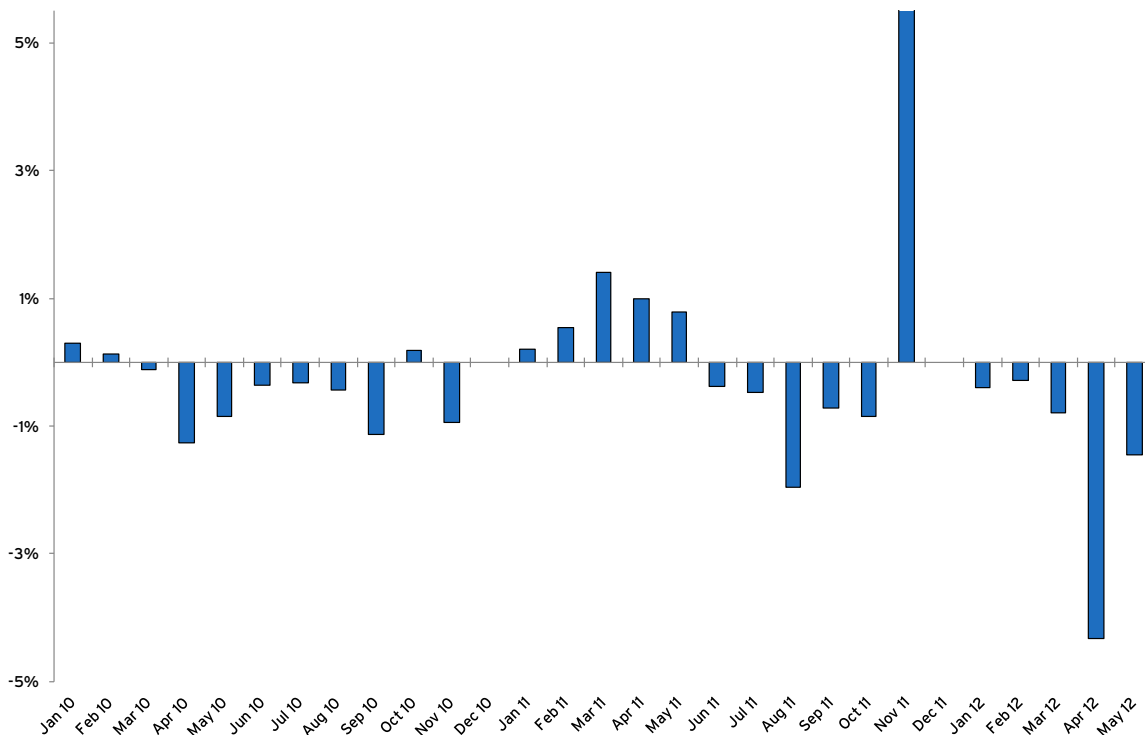
Source: BlueNext, EEX, KfW, DEHSt

Figure 14: Clearing prices and BlueNext settlement prices (spot)

The average deviation within spot auctions was comparable to those of the futures market (see Figure 15). The average deviation during the reporting period was around 1 percent. The exceptions are November 2011, when, because of a temporary suspension in trading on BlueNext, no reference prices for the whole month were available and April 2012, when, in the wake of high price volatility after the release of the VET figures<sup>13</sup> for 2011 in late March and an increased demand for spot EUAs from installation operators because of the 30 April deadline for surrendering allowances, the deviation was significantly higher than the average. In June 2012 the migration of the national registries into the Union Registry operated by the European Union Commission was implemented. Between June 1st and June 20th, trading of EUAs on BlueNext was suspended. This is why no meaningful reference price could be determined. However, in general, the comparison of deviations is much less meaningful than on the futures market due to the use of settlement prices.

<sup>12</sup> [BlueNext daily closing prices](#)

<sup>13</sup> In the VET („Verified Emissions Table“) reports prepared annually by the EU Member States, the carbon dioxide emissions reported by the installation operators for the previous year are evaluated and the results presented.



Source: BlueNext, EEX, KfW, DEHSt

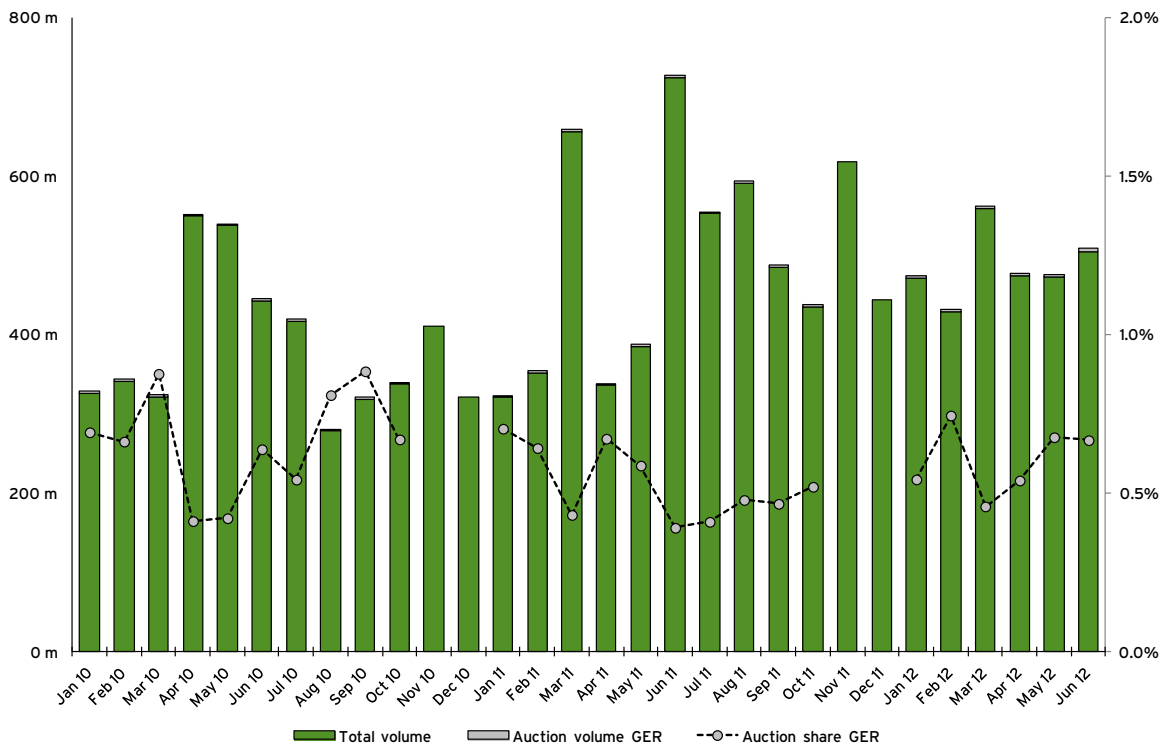
Figure 15: Deviation of clearing prices from the BlueNext settlement price (spot)

### 2.3.5 Auction volume compared to continuous trading

Compared to the 106 million allowances auctioned on the EEX during the reporting period, the trading volume on the entire market exceeded 14 billion allowances during the same period.<sup>14</sup> This resulted in a German market share of around 0.7 percent. Figures 16 and 17 show the trading volume and the resulting market share per month for the reporting period separated by spot and futures markets.

The monthly share of the auctions in the futures market was relatively constant in a range between 0.4 and 0.9 percent over the entire reporting period. This also corresponds to the level of futures sales in 2009. As shown in the previous section, the clearing prices only fluctuated within a small deviation interval around the trading prices observed on the lead exchanges. Any effect of auctions on secondary trading can therefore be almost excluded.

<sup>14</sup> All emission allowances (EUAs) traded on the spot or futures markets on the ICE, GreenX, BlueNext and EEX are taken into account. Included are transactions that were completed directly on the exchange (screen traded) or, as bilateral transactions, have at least used the clearing mechanism of the exchange. Option contracts are not considered. Contracts auctioned by other EU Member States during the reporting period are also included.



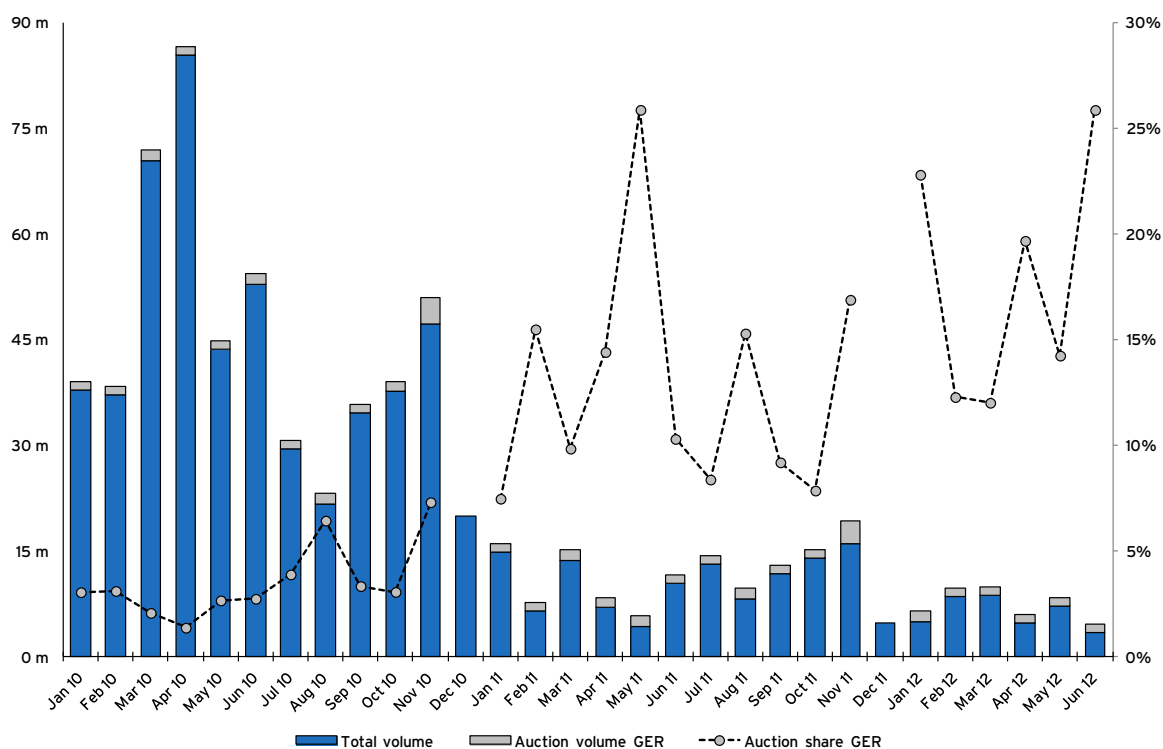
Source: ICE, GreenX, EEX, KfW, DEHSt

Figure 16: Trading volume on the futures market and relative monthly share of German auctions (futures) (m = million)

In this context, the high level of transparency of the process should be noted. Thanks to the fixed auction calendar, market participants can prepare well in advance for the German auctions. A volume concentration is avoided because of the weekly auction rate.

The monthly share of spot auctions in the total trading volume for 2010 ranged between 1.4 and 7.3 percent. Since early 2011, the trading volume on the secondary spot market has fallen sharply (see Section 4.2.4). Accordingly, between January 2011 and June 2012, the German share rose during this period, ranging from 7.5 to 25.9 percent.

Because of the tight links and feedback mechanisms between spot and futures markets (essentially a price difference is based on an interest rate component), any influence on continuous exchange trading can almost be excluded in the spot segment as well. In accordance with statutory requirements the last auctions on the spot market took place towards the end of November.



Source: ICE, BlueNext, EEX, KfW, DEHSt

Figure 17: Trading volume on the spot market and relative monthly share of German auctions (spot) (m = million)

### 2.3.6 Use of auction revenues

The use of the auction revenues which are due to the Government is decided as part of the annual Finance Act. In the current trading period in Germany, a large part of the proceeds from auctioning emission allowances have already gone to national and international projects for climate protection as well as to research and development (R&D) in areas of renewable energy (RE) and energy efficiency as part of the Climate Change Initiative (Klimaschutzinitiative – KI) of the BMU. The following table provides an overview of the level of the additional funds provisioned from the 2008-2011 federal budgets for climate change program measures.

Table 7: Use of sale and auction revenues for climate protection programmes

Use	Disbursements in millions of euros			
	2008	2009	2010	2011
International Climate Initiative	120	120	120	120
National Climate Initiative/Market incentive programme (MAP)	250	308	308	308
Environmental innovation programme	15	15	15	15
R&D; Renewable energy investment subsidies	15	17	17	17
<b>Total</b>	<b>400</b>	<b>460</b>	<b>460</b>	<b>460</b>

Source: BMU, DEHSt

Since 2012, all auction revenues, minus DEHSt expenses, accrue in the Energy and Climate Fund (Energie- und Klimafonds – EKF) established by the Federal Republic of Germany on 1st of January 2011 – a special fund which has become particularly important in the context of accelerated energy systems transformation. In addition to the expenditure already provisioned in the federal budget and financial planning, this fund provides the financial framework for additional programme expenditure for supporting environmentally sound, reliable and affordable energy supply, and climate protection.

It is used to finance measures in several areas, including energy efficiency, renewable energy, energy storage and network technology, energy efficiency of buildings, national and international climate protection and the development of electric vehicles. Since, beginning with the upcoming third trading period, approximately five times the amount of emission allowances as in the current trading period will be auctioned, revenues and capabilities of the EFK will increase accordingly. However, it should be noted that the actual development of EFK revenues will depend largely on the future price development of allowances.

## 3 TRANSITION TO THE THIRD TRADING PERIOD

### 3.1 OVERVIEW

With the start of the third trading period in 2013, auctions will become the standard allocation method for stationary activities in the European Emissions Trading System (EU-ETS). Free allocation will only be available transitionally and will no longer exist for all activities. Electricity producers must acquire all of their emission allowances for power production from 2013 onwards via the auction process (see Section 1.1). The purpose of this is to create targeted investment incentives and to avoid so-called „windfall profits“ for electricity producers (see Section 1.2). Temporary exceptions exist only for the European transitional economies.

As a result, the European auction share for stationary activities will increase from the current 3 percent to around 50 percent of the emissions trading budget (cap). But for calculating the EU-wide auction volume, the 2012 free allocation process must be finished first: Because fundamentally, it is the portion of the cap which is not allocated to the operator free of charge or tied to the new entrant reserve that gets auctioned off by the Member States. The Federal Republic of Germany has an approximate 19.6 percent share of the European auction volume (see Section 3.2).

Aviation has been part of the EU-ETS since 2012, one year before the start of the third trading period. In this area, a total of 15 percent of a separate cap will be auctioned.<sup>15</sup> In contrast to installation operators, aircraft operators can use both aviation allowances (EUAAAs) and EUAs for their EU-ETS obligations. So far the European Commission has not yet specified what the proportion of shares of the individual member states in the Europe-wide aviation auction volume will be. This will be calculated based on the individual Member States' emission volume of eligible flights in 2010. In principle, the same process regulations apply to EUA and EUAA auctions as specified by the EU Auctioning Regulation.

### 3.2 „EARLY AUCTIONS“

In order to provide a smooth transition between trading periods for the installation operators, the EU Member States agreed in July 2011 to auction 120 million allowances for stationary installations from the 2013 and 2014 allocation in 2012 („early auctions“). In the Federal Republic of Germany, this will amount to around 23.5 million allowances.

The breakdown of the auction amount is calculated according to the specifications of the 2009 EU Emissions Trading Directive for the third trading period. For the most part, the allocation key is based on the proportion of historic emissions of a Member State in the EU-ETS (88 percent). Another 10 percent will be redistributed between the Member States in the interests of solidarity and growth. The remaining 2 percent are based on the early achievement of greenhouse gas reduction targets under the Kyoto Protocol. The following table provides an overview of the breakdown by Member States for 2012. Auctions of the current trading period and aviation auctions are not taken into account.

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<sup>15</sup> The EU-Cap for aviation amounted to 215 million EUAA (2012) or 210 million EUAA (from 2013).

Table 8: Auction volume by Member State in 2012 (early auctions)

Member State	Auction volume	Relative share of total amount
Germany	23,531,000	19.6%
Poland	14,698,000	12.2%
United Kingdom	12,258,000	10.2%
Italy	11,324,000	9.4%
Spain	10,145,000	8.5%
France	6,434,000	5.4%
Romania	5,878,000	4.9%
Czech Republic	5,503,000	4.6%
Greece	4,077,000	3.4%
Netherlands	3,938,000	3.3%
Bulgaria	3,277,000	2.7%
Belgium	2,979,000	2.5%
Portugal	2,065,000	1.7%
Finland	1,965,000	1.6%
Slovakia	1,805,000	1.5%
Hungary	1,761,000	1.5%
Austria	1,636,000	1.4%
Denmark	1,472,000	1.2%
Ireland	1,100,000	0.9%
Estonia	1,068,000	0.9%
Sweden	1,046,000	0.9%
Lithuania	637,000	0.5%
Slovenia	520,000	0.4%
Latvia	315,000	0.3%
Cyprus	307,000	0.3%
Luxemburg	141,000	0.1%
Malta	120,000	0.1%
<b>Total</b>	<b>120,000,000</b>	<b>100%</b>

Source: COM

### 3.3 HARMONISED AND NON-DISCRIMINATORY AUCTIONS

The legal framework for the auctions in the third trading period is the EU Auctioning Regulation which came into force in November 2010. The regulation is designed to provide harmonised, non-discriminatory and cost-efficient access to the European primary market for emission allowances to market participants. The existing infrastructure of exchanges is to be used as much as possible, not least because of the positive experiences with the exchange-based auctions in the current trading period in Germany and other Member States such as Austria. To that end, future auctions throughout the EU shall only take place on exchange platforms that are part of regulated markets. In future, the auctions will continue to be conducted using the established single round, uniform pricing method and closed order book.

With few exceptions, all the relevant elements of the German auction design approach are also reflected in the harmonised European framework of the EU Auctioning Regulation. Significant deviations exist only in the auction products. Continued use of the flexible futures products will soon no longer be possible. In principle, Member States may only choose between two different contracts, which – even if they are referred to as „futures“ in the EU Auctioning Regulation – have a delivery time of two to a maximum of five days, and are therefore hereinafter referred to as „spots“. In Table 9, the German and European framework for the auctions in the second and third trading period are compared in an overview.



Table 9: Comparison of German and European auction frameworks

	German framework (2010 to 2012)	European framework (2012/2013 to 2020)
Auction platform	Exchange	Exchange
Auction procedure	Uniform price method with one bidder round per auction and closed order book	Uniform price method with one bidder round per auction and closed order book
Auction product	Spot and Futures	Spot
Time window for bids	2 hours	At least 2 hours

Besides participating in an auction platform („common platform“) jointly commissioned by the European Commission and interested Member States, the EU Auctioning Regulation envisages the possibility that Member States will continue to operate their own platforms. In addition to Germany, the United Kingdom and Poland have already decided to do so. This allows bidders to participate in auctions in the third trading period on venues most appropriate to them. Furthermore, a number of trading venues (as compared to only one) promote competition on the secondary market. It may also be economically worthwhile for companies to combine primary and secondary trading activities on the same stock exchange.

A Community-coordinated auction calendar, uniform and non-discriminatory access conditions as well as joint monitoring of all platforms by an „Auction Monitor“ constitute other important conditions for successful auctions in the third trading period.

Before starting auctioning on the auction platforms in the United Kingdom, Poland and Germany, these countries must also prove to the Member States and the European Commission that their proposed platforms meet the formal requirements of the EU Auctioning Regulation and is compatible with the objectives of the EU Emissions Trading Directive by providing the relevant details. These are in particular:

1. **Non-discrimination:** The platform guarantees de facto and de jure compliance with the non-discrimination principle:
2. **Equal access for SMEs:** The platform provides full, fair and equal access for SMEs, provided they fall under the EU-ETS.
3. **Efficient Supervision:** The platform ensures efficient monitoring of the auction procedure, reporting suspicions of money laundering, terrorist financing, criminal activity or market manipulation and the application of remedies and sanctions.

If the proposed platform meets these criteria, it should be included in Annex III of the EU Auctioning Regulation. For this purpose, the Regulation will be formally changed by a European legislative process, but that takes at least four months.

### 3.4 GERMAN AUCTIONS IN THE THIRD TRADING PERIOD

In February 2012, Germany was the first Member State to successfully complete its procurement procedures for commissioning an auction platform. In April, the Commission and the Member States confirmed the German platform’s compliance with the European requirements. The auctions can be expected to begin in September, immediately after the coming into force of the EU Auctioning Regulation complemented by the German platform.

First, a transitional platform was put out for tender. Here the EU Auctioning Regulation distinguishes between transitional and definitive platforms. For commissioning a definitive platform, certain parts of the EU financial market policy must be implemented into the relevant national law of the state where the auction platform is accommodated. However, a relevant implementation had not taken place by November 2011 in all Member States where the appropriate exchanges have their seats. Hence, a call for tender for the definitive platform would have resulted in the exclusion of some of the local exchange operators at the time and considerably limited the competitiveness of the tender. On the other hand, waiting for the legislative process would have greatly delayed the start of the German auctions. After considering these issues, Germany decided to put out a Europe-wide tender for a transitional platform at first.

The European Energy Exchange (EEX) and its affiliated clearing house, the European Commodity Clearing AG (ECC) in Leipzig prevailed in the German tender procedure. In addition to the auctions in the current trading period, EEX will auction off the German EUAs for the third trading period and the EUAs at least until the end of March 2013. A definitive auction platform will be set up in 2013. DEHSt will carry out another Europe-wide tender procedure for this in 2012. Until then, the transitional platform will continue its work on an interim basis up to the end of 2013 at the latest. The role of vendor to the transitional platform will also be taken on by KfW.

The conditions for participation in spot trading on the EEX described in Section 2.3.2 also hold for the transitional auctions. In particular, the „auction-only access“ presented there has been developed in view of the growing importance of auctions in the next trading period, and has been geared to the specific needs of SMEs. In addition to direct participation, the EU Auctioning Regulation also allows an indirect access through licensed financial intermediaries. According to current practice, market participants who are already listed on the secondary market of EEX will continue to participate directly and without additional cost in the auctions.

## 4 BACKGROUND: THE EMISSIONS TRADING AS A FRAMEWORK FOR THE AUCTION IN EU-ETS

In the first chapter we have shown that the second allocation period of the EU-ETS was affected by different selling models in the Member States. The German experience with the exchange-based auctions established in the current trading period has been presented in Chapter 2. This approach has gained acceptance as an EU-wide standard allocation for the third trading period in the EU-ETS (see Chapter 3). This ensures that future auctions will be largely implemented based on proven market structures. The infrastructure will therefore be presented in more detail in the following background. Basically, the trade of goods and rights in a market can be organised in two different ways:

1. as „over-the-counter“ (OTC) off-exchange trading and
2. as exchange trading.

These two trade routes have also been established in the EU-ETS. The properties associated with the respective market segments and their advantages and disadvantages will now be briefly discussed.

### 4.1 OVER-THE-COUNTER TRADING (OTC)

An OTC transaction takes place directly between two market participants without the intervention of a stock exchange and its standardised contract specifications. The parties can very easily shape the transaction terms such as price and settlement date. In general, the negotiated price in OTC transactions is based on the stock price but there is no obligation to adhere to it. The settlement, i.e., the transfer of goods or rights and of the purchase price to be paid takes place directly between the parties.

In addition to a high level of flexibility, OTC transactions are also used to avoid publicity of a transaction or to mitigate the impact of very large transactions on the stock exchange trading. Regular OTC transactions off the stock exchange, however, lead to an underestimation of the market's actual liquidity when it is just the exchange order book that is viewed. Also, the generally desired effect of a transaction to the market price and its information content are lost.

In addition, OTC trading is subject to less control and less supervision than exchange trading. Upon completion of an OTC transaction, both parties are subject to the risk that the other party does not or cannot fulfil their part of the contract („counterparty risk“ or „default risk“). This risk is particularly high for long-term transactions, i.e. with a compliance date in the distant future. As a measure for mitigating risk, both parties can agree to exchange securities or offset other contracts between these parties („netting“). In addition, OTC transactions with a long duration are accompanied with a liquidity risk. In general, it is difficult and expensive to close these transactions with a counterparty other than the original. This is especially difficult in market phases where one party wants to close the position while the other party is often unwilling to do so.

Fundamentally, emissions allowances can be auctioned outside established trading exchanges and thus would be regarded as OTC transactions. One option would be to develop an electronic trading platform which then acts through a government agency or a third party on its behalf. Considering the above arguments, auctioning of emission allowances via OTC transactions, however, seems to be associated with some disadvantages. This applies particularly to a situation where a large number of differently structured companies participate in the auctions in the third trading period. From the state's perspective, the complex management of default risks should in particular be mentioned. An electronic trading platform for the actual implementation of the auctions would also have to be provided by the state.

By comparison, these problems are very scarce in the established emissions trading exchanges. In addition to easy access to the existing trade, settlement and monitoring systems, there is another argument where many potential auction participants have already been active in so-called secondary trading on the stock exchanges. The stock-based auction usually causes no significant additional costs for these companies.

To meet the requirements of an equally robust and cost-efficient allocation tool, the existing structures of secondary trading need to be adjusted in only a few areas to make them suited to the primary market. In particular, the exchange access must be tailored to the needs of facility operators subject to emissions trading because of the growing importance of the auctions. The access options to the primary market are described in Chapter 2.

## 4.2 EXCHANGE TRADING

In contrast to an OTC transaction, stock exchange transactions are subject to a number of requirements. Interested parties must apply for approval as trading participants on the exchange. The exchange checks whether the legal, financial and technical requirements are fulfilled. This is necessary in order to ensure a safe exchange trade and increases the confidence of all market participants in the stock exchange.

As opposed to OTC transactions, standardised commodities are traded on the stock exchange. The minimum size of a transaction, the trading hours or the possible compliance dates are often specified by the exchange. A deviation from the requirements of the stock exchange is usually not possible. Also, the actual realisation of a stock market transaction is determined by a combination of rules, e.g. in pricing or the process of error correction.

Thus, the new price must be determined based on previously determined market prices. This may calm the market down, especially in crisis situations.

In addition, there are comprehensive reporting and disclosure obligations on the stock market. All passed market transactions are published including sales volumes and prices.<sup>16</sup> This transparency strengthens the confidence of all participants in the market and their own trading activities. Probably the greatest advantage of exchange trading as opposed to over-the-counter trading, however, lies in the extensive infrastructure of the exchange which reduces the default risk of individual transactions.<sup>17</sup> These are described in the following section.

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<sup>16</sup> There may be exceptions in the OTC areas of the exchanges. Some information is not communicated to other market participants, however, the supervision is generally aware of them.

<sup>17</sup> Usually there are also hybrids between exchanges and OTC trading. Here, OTC transactions are settled through the clearing mechanism of the exchanges.

### Info Box: Exchange trading in the EU-ETS

Stock exchanges have emerged in many markets as the central trading platforms. The liquidity of the stock exchange provides flexibility to the market participants in their trading activity. In addition, an extensive infrastructure has developed to hedge default risks. Meanwhile, a number of stock exchanges have been established for emissions trading. In general, the stock exchange carriers have a wide portfolio of other trading segment such as coal, natural gas or power.

The existing exchange structures could be quickly adapted to this new market segment after the introduction of emissions trading. The same applies to the existing structures of the exchange and financial supervision. Both factors favored the rapid development of exchange-based emissions trading. The major European trading venues include:

- Intercontinental Exchange (ICE) in London,
- European Energy Exchange (EEX) in Leipzig,
- BlueNext in Paris,
- Green Exchange (GreenX) in New York,
- NASDAQ OMX Commodities (formerly Nordpool) in Oslo.

#### 4.2.1 Clearing and settlement

Once two market participants have agreed a transaction on the exchange market and on its terms (usually only the price is relevant due to the high level of standardisation), this agreement must be implemented. Before the actual commodity is exchanged against the agreed purchase price, which is called „settlement“, the mutual claims and obligations must be identified and charged. This process is called „clearing“ and is associated with the risk that the counterparty will not or cannot fulfil its contractual obligations. As part of the clearing to reduce risk, therefore, an extensive and recognised system of obligations has been established for the deposit of collateral.

The clearing is performed by a central counterparty. This central counterparty (CCP) enters the contract after a transaction has been completed and stands between the buyer and seller, i.e. the original seller sells the commodity to the central counterparty, while the buyer does not buy it from the original seller but from the central counterparty. Thus, one economic business gives rise to two ‘legal’ businesses. This centralisation of all stock exchange transactions has three implications:

1. **Anonymity of trade:** Account information must be exchanged only with the central counterparty. The settlement always takes place with the central counterparty.
2. **Efficient settlement:** The trade participants have only one legal party to all transactions on that exchange.
3. **Low default risk:** Both parties of the initial transactions only carry the risk associated with the central counterparty and not that of the original counterparty.

To also mitigate the risk for the central counterparty, collateral from the participants is required – similar to OTC trades. This collateral and other security measures increase the creditworthiness of the central counterparty from which the individual market participants will benefit directly<sup>18</sup>. After the completion of a transaction, the clearing house requires the so-called „initial margin“ as a risk provisioning. The amount of security deposit required in cash or securities at the beginning is determined according to a statistical estimate of the market price volatility of the commodity and its price risk over a short period of time („overnight risk“). This ensures that there is no hedging shortfall by the time of the next payment of a security.

Due to daily price changes, open claims emerge on one side of the contracting parties and open obligations on the other vis-à-vis the clearing house. This may in particular play a significant role during longer terms. The daily balancing of these claims and obligations is called „variation margining.“ As a result of the centralisation of trade through the clearing house, all positions of a market participant are considered in aggregate.

<sup>18</sup> Direct involvement of trade participants in the clearing business or the procedure for the distribution of losses is possible if a trade participant fails.

Thus, opposing positions lead to an economically reasonable reduction in payment of security.

By means of these measures, the central counterparty has become a key part of modern stock exchanges. The task of the central counterparty and its margining system is to ensure the right level of protection for all market participants, without needlessly tying down liquidity.

#### 4.2.2 Stock exchange and financial supervision

The primary task of market supervision is to ensure orderly trading on the stock exchange. Various acts and institutions play a role. Since the German auctions of emission allowances are performed at the EEX exchange in Leipzig, in addition to EEX's own rules, all regulations for the stock exchange and financial supervision also apply. In the third trading period, additional requirements will be specified by the EU Auctioning Regulation (see also Section 3.3). The following section provides an overview of the situation in Germany:

- **Supervision of securities:** The European Directive on Insider Dealing and Market Manipulation (2003/6/EC) and the European Financial Market Directive (2004/39/EC) are *inter alia* implemented in the Securities Trading Act (WpHG). The Securities Trading Act regulates, in part, cooperation with the EU Auctioning Regulation, the prohibition of insider trading and market manipulation with emissions allowances. The scope includes both auctions and other trading. The Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht, BaFin) supervises compliance with prohibitions and the requirements of the Securities Trading Act and may issue orders that are appropriate and necessary to enforce its objectives. It also has its own investigative powers. Market manipulation and insider trading can be punished, with the imposition of a multi-year prison sentence in extreme cases.
- **Measures against money laundering:** The Act on the Detection of Proceeds from Serious Crime (GwG) implements the policy on due diligence and reporting requirements to prevent money laundering and terrorist financing (2005/60/EC). As central settlement bodies for all transactions at the stock exchange, clearing houses in particular are subject to these obligations while the stock exchanges themselves in general are not subject to any obligations under the GwG because it is not them, but the clearing houses who settle the cash flow between trade participants. Here, too, BaFin supervises and may take appropriate and necessary action to ensure compliance with the requirements set out in the GwG.
- **Exchange supervision:** In addition to the above-described general financial supervision, there is a specific supervision for stock exchange trading. The exchange supervision guarantees orderly trading on the stock exchanges as specified by the Exchange Act (BörsG). As explicitly mentioned in the Act, the provisions also apply to the auctioning of emission allowances. The monitoring of the various stock exchanges in the Federal Republic of Germany is the responsibility of the exchange supervision authorities of the States (Länder). The competent Authority for the EEX located in Saxony is the Saxon State Ministry of Economy, Labour and Transport (SMWA) in Dresden. The SMWA supervises compliance with stock exchange regulations and ordinances, and in particular, the orderly conduct of trading on the exchange and the due fulfilment of exchange transactions. The emphasis here is primarily on the supervision of the pricing processes. The SMWA is also entitled to participate in the deliberations of the exchange bodies and they are obliged to support the SMWA in fulfilling their duties. A potential obligation to provide information to the SMWA exists for the stock exchange, stock exchange carrier and trade participants. To maintain order, SMWA can intervene by issuing ordinances.
- **Market Surveillance:** The Market Surveillance Office (Handelsüberwachungsstelle, HÜSt) located in the respective exchange is also involved in market surveillance. An independent exchange body, as specified by the Exchange Act, HÜSt monitors the trading and settlement of exchange transactions. With its direct contact to the market, HÜSt primarily supervises pricing. HÜSt's central task is therefore the systematic collection, analysis and evaluation of all data from stock exchange trades. In case of violation, it carries out the necessary investigations while exchange supervision may issue instructions to HÜSt. In fact, HÜSt is only subject to the instructions of the exchange supervision and as such is not bound by instructions vis-à-vis the stock exchange.

### 4.2.3 Products traded

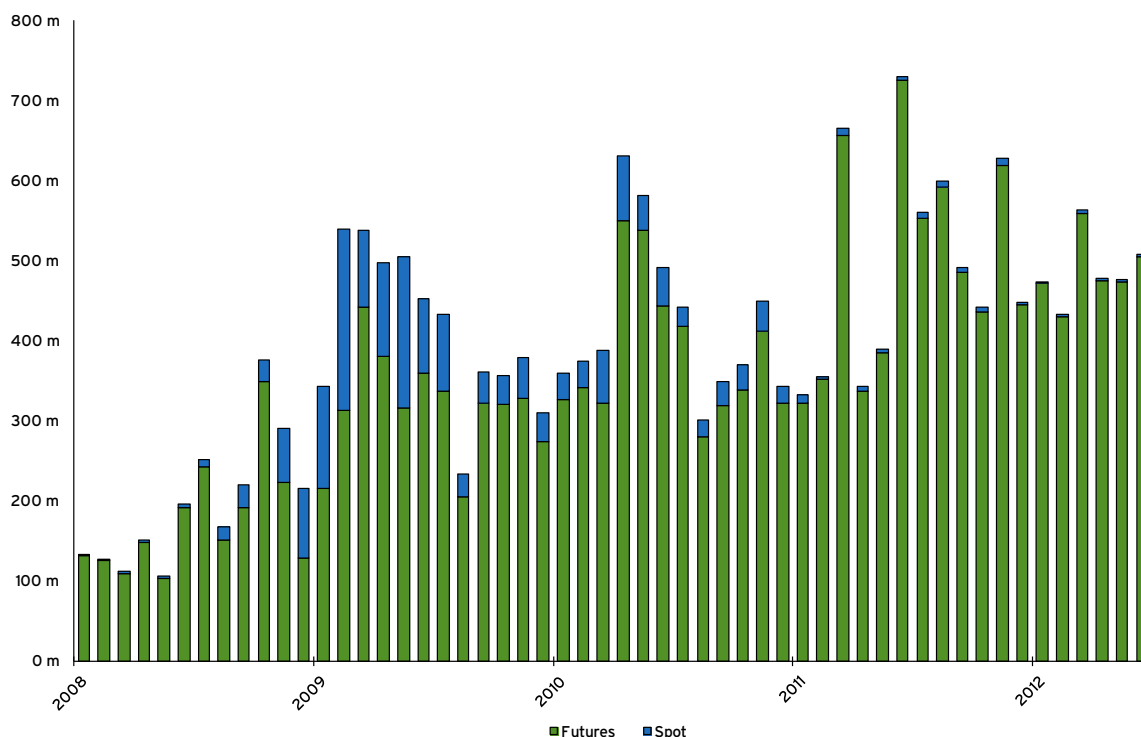
Similar to other capital and commodity markets

1. spot and
2. futures products can be traded in the EU-ETS.

In the spot market, trades must be completed within two days at the latest, i.e. exchanging EUAs and the agreed purchase price. The futures market covers all transactions with a settlement date at least three trading days after the trade date.

The futures market is clearly the larger market in the EU-ETS, while the following assertions refer solely to stock exchange trading as a result of the opaqueness of OTC trading.<sup>19</sup> Between 2005 and the end of June 2012, with 20.4 billion traded EUAs, more than 90 percent of the transactions took place on the futures market, only 2.2 billion EUAs were traded on the spot market. In some exchanges, futures can be traded with a settlement date of a day or two. Although these are formally traded on the futures market, they are in an economic sense still spot products because of the immediate fulfilment.

The following figure illustrates the aggregated monthly trading volume in both markets in the second trading period. First, a trade increase in the middle of 2008 is conspicuous. At the beginning of the observation period, the monthly exchange volume ranged between 100 and 150 million EUA. In the following months, the amounts successively increased and reached 500 million EUA in February 2009 for the first time. Since then, trading activity was above the level of 300 million EUA. An exception is the month of August where, between 2008 and 2010, trade dropped significantly in this traditional holiday period compared to the average annual level. Trading was relatively strong in August 2011. This could be inter alia due to the significant price movements over the same period (also see Section 4.2.6).

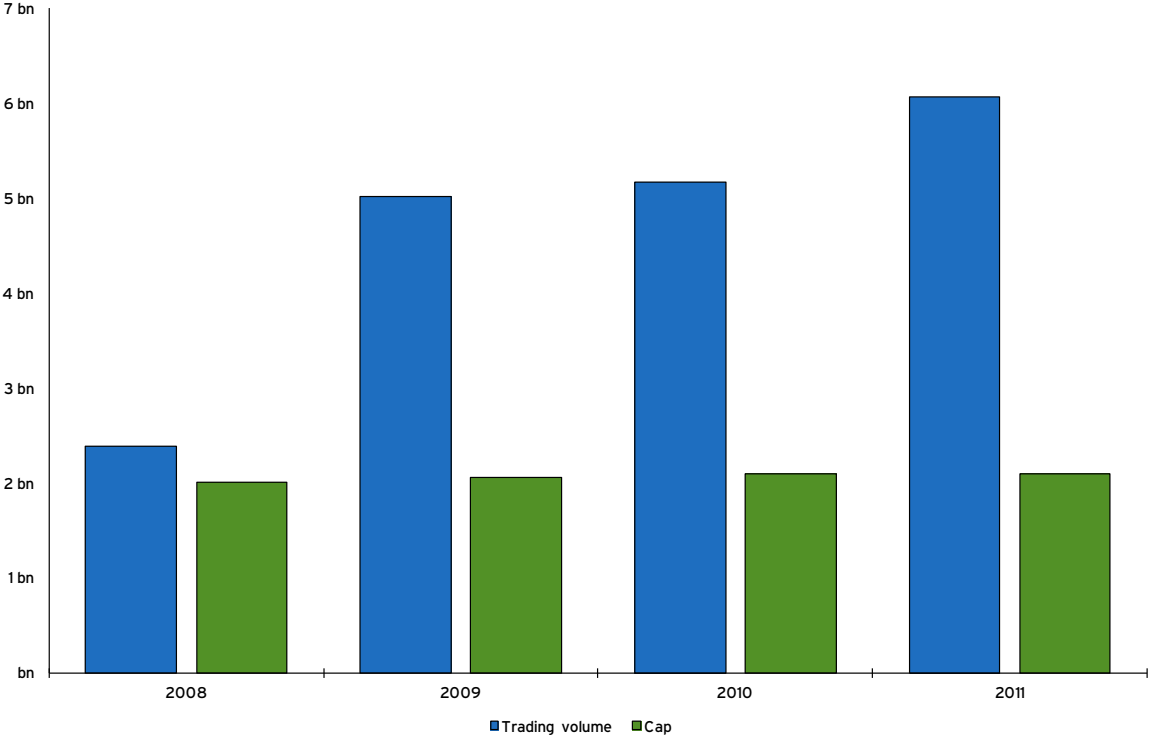


Source: ICE, BlueNext, GreenX, EEX, KfW, DEHSt

Figure 18: Monthly EUA trading volumes in the second trading period (m = million)

<sup>19</sup> All emission allowances (EUAs) traded on spot and futures markets on the ICE/ECX, GreenX, BlueNext and EEX exchanges are considered. Transactions that have been completed directly on the stock exchange (screen traded) or, as bilateral transactions, have used at least the clearing mechanism of the exchange are included. Option contracts are not involved. Contracts auctioned by other EU member states during the reporting period are also considered.

The total EUA amount traded on the stock exchanges is now a multiple of the annual allocations within the EU ETS. It can be concluded that emissions trading has been accepted by the market participants and can provide an economically optimal cost redistribution of emission reductions between the participating systems. In 2011, mathematically, each allocated EUA was resold three times through the stock exchanges. In the first year of trading, the ratio of primary to secondary market was still less than one. In the following figure, the allocation quantities are compared with the trading volume on an annual basis.



Source: ICE, BlueNext, GreenX, EEX, COM, KfW, DEHSt

Figure 19: Trading volume and cap in the EU-ETS (bn = billion)

#### 4.2.4 Spot trading

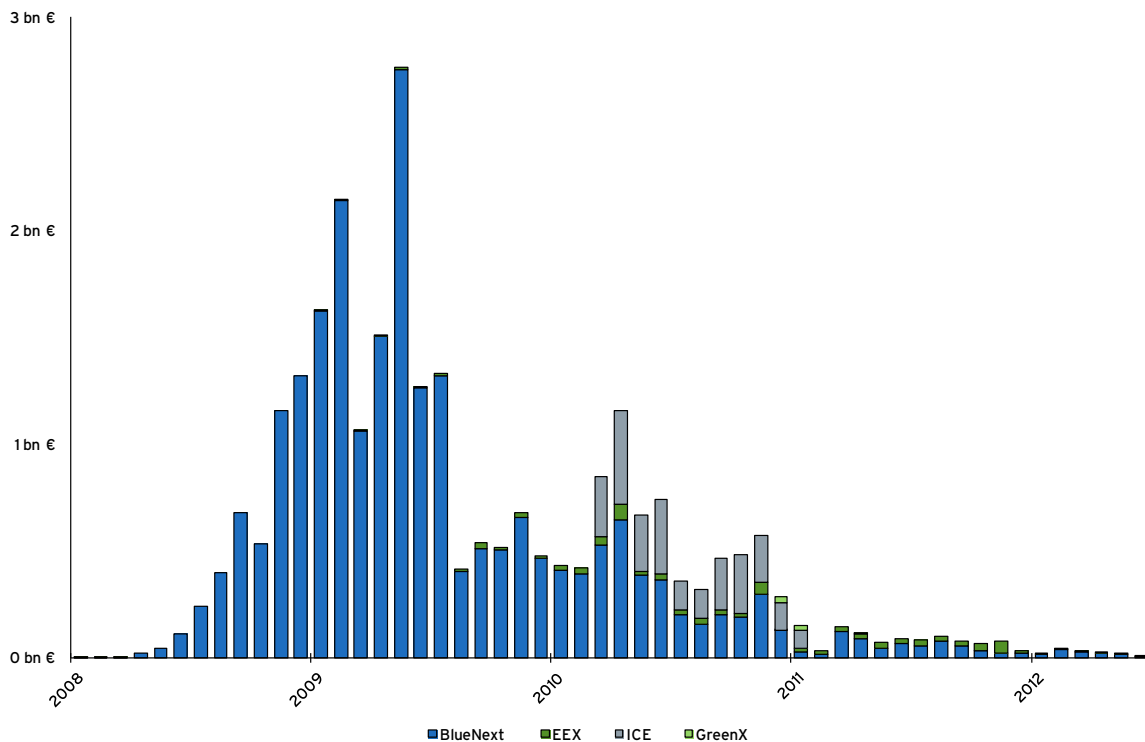
Since transactions on the spot market or cash trading are settled within a few days, the constant availability of the necessary registry architecture plays a prominent role in this market segment. The network of the Emissions Trading Registry with its central components CITL<sup>20</sup> (European Commission) and ITL<sup>21</sup> (UN-Climate Secretariat) has been designed for quick and accurate settlement of transactions and high availability of emission allowances.

The availability of the systems was generally well above 99.5 percent, i.e. a maximum unavailable period was 2 days per year. Some registries achieved markedly higher availability, for instance the German registry had an availability of 99.9 percent in 2011. Transactions were usually settled in the German registry within a few seconds. Transactions took an hour in less than five percent of the cases and considerably less than one percent of the transactions were terminated after 24 hours, e.g. because one of the registries involved was not available.

BlueNext in Paris has developed as the lead market for spot trading in the EU-ETS. However, differences in the market prices of the various spot trading markets are usually marginal. Trading in spot contracts is therefore fairly integrated. The following figure shows the monthly turnover of spot products broken down by the major stock exchanges.

20 The Community Independent Transaction Log (CITL) is a mechanism under the EU ETS, which links the national registries of all EU Member States with each other and, being a central registry, monitors and records operations such as transactions or account opening.

21 The International Transaction Log (ITL) is the transaction registry for emission allowances under the Kyoto Protocol and is administered by the UNFCCC.



Source: ICE, BlueNext, EEX, KfW, DEHSt

Figure 20: Turnover in spot trading (by stock exchanges) (bn = billion)

In early 2009, there was a visible revival of trade (the figure only shows trading on the exchanges). The share of spot trade in the total trade volume increased in part up to 40 percent. It turned out later that spot trading was greatly abused during this period by a major systematic VAT fraud, as had already occurred in transboundary trade with other goods. After uncovering the fraud and the introduction of appropriate countermeasures, the share of spot trading fell back to below 10 percent. In particular, the so-called „reverse charge procedure“ protects emission trading against further fraud of this kind in the future. This is a VAT regulation which is intended in particular for transboundary trade and arranges for the payment of VAT to be displaced to the end of the tax chain whereby VAT fraud is prevented by so-called „carousels“.

In January 2011, emission allowances were stolen from several national registry accounts by so-called „phishing“ (see following box). The security gap could be closed quickly by enhanced security measures. Nevertheless, the European spot market in fact came to a halt due to unclear ownership of potentially affected allowances. In consequence, the share of spot trading in total sales dropped to about 2 percent. Spot trading remained closed on some exchanges until the time of reporting. Trading on the BlueNext was once again enabled shortly after opening the national registry, even though sales plummeted significantly compared to previous months. Trading was open during the entire reporting period at EEX.

It should be noted that VAT fraud and phishing are not quirks of emissions trading, they were also observed in other markets. Meanwhile, appropriate structures have developed in the EU-ETS in order to effectively prevent such abuse in the future.



### Info Box: Safety gaps in the registry are closed

The registry is similar in its basic functions to an online banking system. The application is used without additional software only by the Internet browser. Users log in with their ID onto the system and they can then view their assigned accounts. Depending on their assigned role they can initiate transactions, confirm, reject or only view.

In 2010 and 2011 there were several phishing incidents. Allowances were stolen when unauthorised persons got into the possession of the so-called credentials (username and password). After a suspension of transactions in February 2011 by the European Commission and significantly tougher safety requirements for the registry, the German registry was one of the first to be able to again participate in emission trading. In addition, a so-called two-factor authentication was introduced. During user login and for transaction confirmation, a security code texted from the registry to the mobile phone specified by the user must be entered. In addition, the German registry has regularly undergone so-called penetration testing. In this test, using current hacking methods, experts try to break into the registry in order to identify weak spots and then eliminate them.

Against the background of increased European harmonisation, it was decided to introduce a centralised, EU-wide Union Registry. The Union Registry started successfully on 20th of June 2012. The partial activation on 1st of January 2012 initially offered only a very limited partial functionality. The safety standards have been considerably improved:

- **Checking account opening applications.** The legal basis for the rejection of account opening applications has been refined considerably in the last amendment of the EU Registry Regulation. Now, an application can be rejected even in cases of suspected abuse. Existing personal holding accounts were rechecked.
- **Two-factor authentication.** The two-factor authentication has been introduced throughout. The need for additional confirmation in prompting a transaction by smsTAN has been confirmed.
- **Business hours.** Transactions can be proposed at any time, but they are initiated only during business hours (working days from 10:00 to 16:00 hours).
- **26-hour delay in transactions.** Once a transaction has been proposed, the account holder has 24 hours to cancel the transaction if it was proven to be fraudulent. Thereafter, the Registrar has two hours for the effective cancellation of the transaction.
- **Trust accounts list.** In the future, the account holder can create a trust account list meaning that transactions are possible without the 26-hour delay to the accounts referred to in the list.
- **Strengthened property rights.** The new EU Registry Regulation has been aligned with respect to the property rights of the German model in the TEHG. Thus, the transfer of ownership takes place at the time of finalising the transaction in the Union Registry.
- **Suppression of serial numbers.** The serial numbers of allowances are no longer displayed. This should eliminate the uncertainty in the market because of allegedly stolen allowances which occurred in the past.

#### 4.2.5 Futures trading

Products traded on the futures market with unconditional commitment to supply are called „forwards“ in OTC trading and „futures“ in exchange trading. They differ in practice from each other by the margining process to reduce default risk as described in Section 4.2.1. Due to margining, cash payment is performed prior to the maturity date for open futures positions. Because of the large number of different maturity dates, a corresponding number of tradable products exist on the futures market.

In general, the maturity dates of futures contracts are in the middle of the next four months and at the end of the quarter (i.e. mid-March / -June / -September / -December). In addition, there are further annual contracts with a maturity date in December. Initially, only contracts terminated by December 2010 were tradable. Then an extension to December 2014 took place and, since mid-2010, contracts with a settlement date in December 2020 have been tradable.

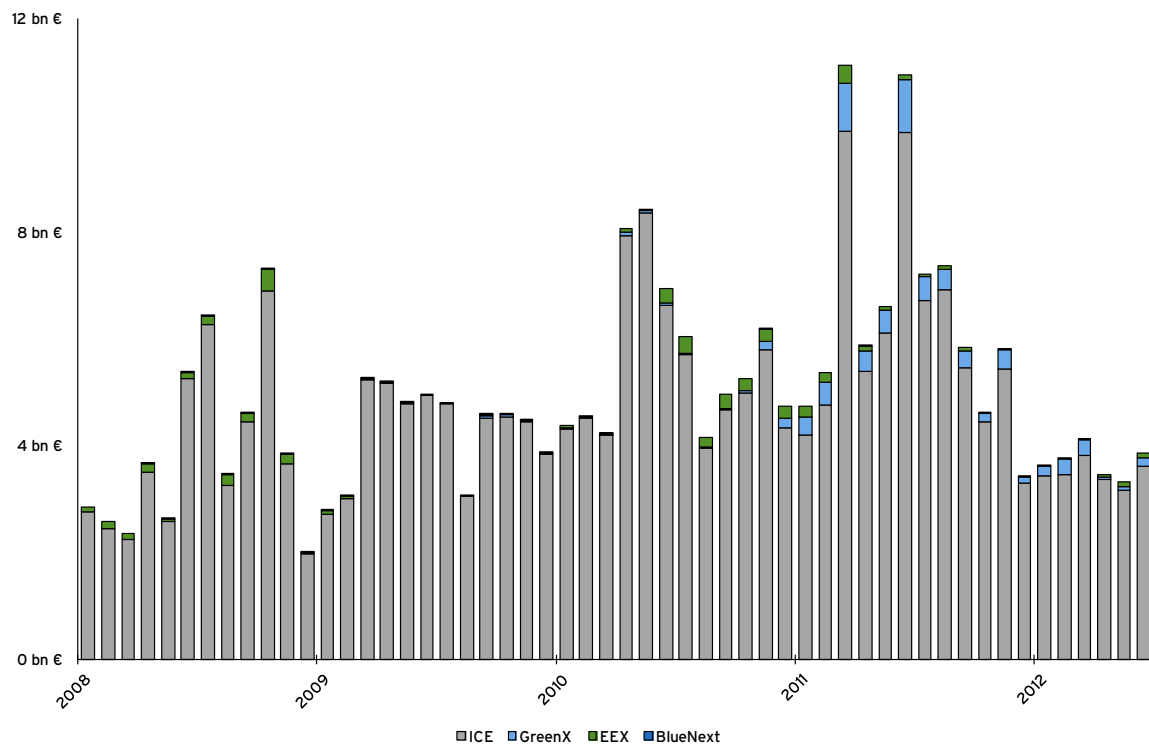
Thus, trade participants have adequate tools to significantly reduce the uncertainty of their future cost for greenhouse gas emissions and to adapt the procurement of their emission allowances to their planned greenhouse gas emissions. The so-called „front-year“ future is often used as a benchmark price for the futures market.

### Info Box: „Front-year“ futures contract

On the capital and commodity markets, concentration of liquidity on the December contract can often be observed, as many hedging strategies are used at the beginning of the year with an expectation horizon at the end of the year. This trade concentration can also be observed in futures trading of emissions allowances. Therefore, this contract is often used as a reference price for the less liquid spot trade in order to make statements about the market trends. After the maturity of the contract in mid-December, a change-over to the next December contract in the following year takes place. This concatenation of December contracts is known as „front-year“ futures contract because it corresponds to the futures price of the next December contract at all times.

The price difference between spot and futures market is primarily determined by the interest on the time difference in maturity dates („cost of carry“). This will become increasingly smaller over the course of a year until it changes to the next maturity in December. Differences between the spot and futures market prices (taking into account the cost of carry) are generally used quickly by speculative market participants and thus lead to a re-adjustment of the price.

The London Exchange ICE has become the lead market for the futures market in emissions trading. About 90 percent of the trade in futures contracts of emission allowances is currently concentrated in London. As on the spot market, market price deviations between the different futures markets are generally low. The following figure shows the monthly turnover of futures products broken down according to stock exchanges.



Source: ICE, BlueNext, GreenX, EEX, KfW, DEHSt

Figure 21: Turnover on the futures market (by stock exchanges) (bn = billion)

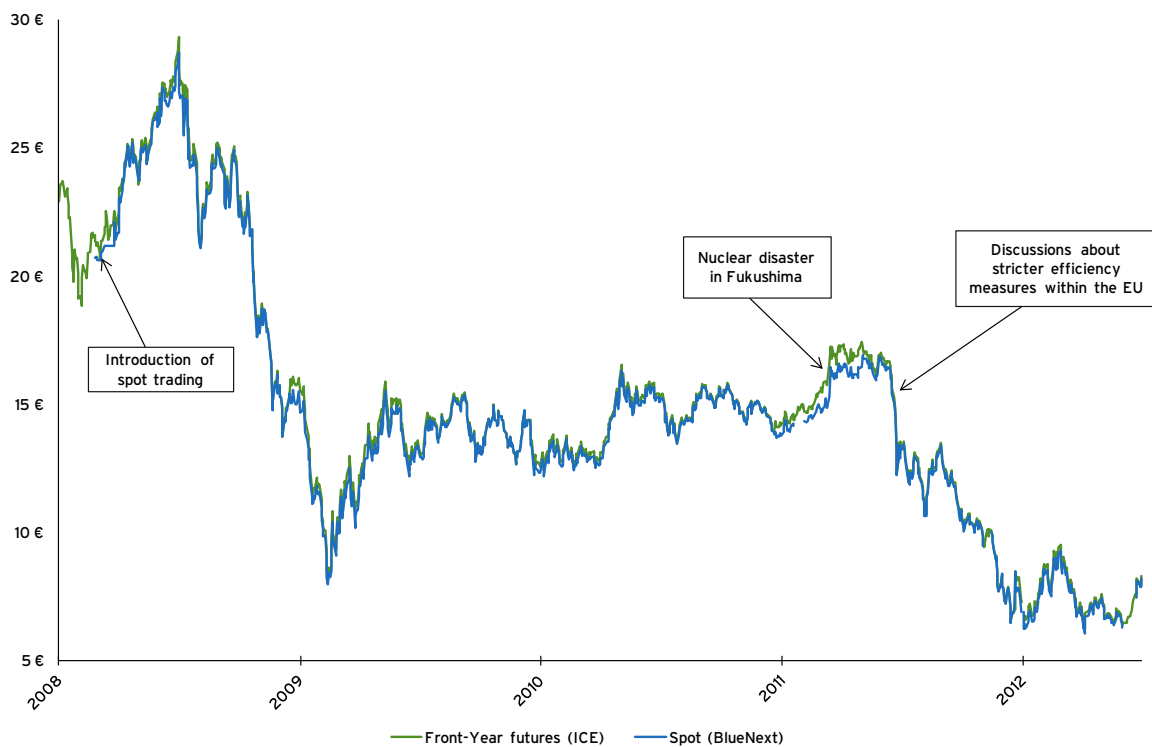
From the upcoming third trading period, only emission allowances in the form of two-day spots or five-day futures shall be auctioned by the Member States. Front-year futures contracts will not be auctioned on the primary market any more. The relevant decision was primarily justified by the generally higher requirements for clearing of futures contracts.

#### 4.2.6 Market price developments

The market price for EUAs in the second trading period had a high volatility and was significantly influenced by different trends. The following figure illustrates the market price from 2008 on the spot and futures lead markets<sup>22</sup>.

As the figure shows, spot trading only began during 2008. This was due to the delayed commissioning of the infrastructure for the delivery of emission allowances. Because of the decoupling of transaction completion and delivery of allowances in the futures market, trading in futures was not affected.

At the beginning of the trading period, the price for the front-year futures first dropped within a month from around €24 to below €20 per EUA. Following positive economic developments, market prices rose eventually to an all time high of just under €30. The start of the financial crisis 2008/2009 caused a massive reduction in liquidity, including a reduction of positions to free tied-up capital. The onset of a negative price trend was particularly exacerbated by the worsening economic outlook and the market price fell to under €10 per EUA for the first time in January 2009. This price decline was followed by a period of relative calm where the market price fluctuated between €12 and €15.



Source: ICE, BlueNext, KfW, DEHSt

Figure 22: EUA price in the period of 2008-2012

Shortly after the strong earthquake and the Fukushima nuclear disaster in Japan, market prices rose in March 2011 noticeably and reached a level well in excess of €15. Political decisions in Germany following the nuclear disaster are also considered as a factor influencing price developments. On 14 March 2011, the German government declared a temporary moratorium of three months for the runtime extension of Germany's nuclear power stations.

<sup>22</sup> The respective closing prices („settlement prices“) on the BlueNext and ICE exchanges were used.

As a replacement for low-emission nuclear power and in addition to the use of renewable energy, market participants were expecting an increase in electricity generation from fossil fuels and an associated increase in demand for additional allowances.

In June 2011, the EU Commission also concretised their plans for mandatory energy savings by 2020 by 20 percent. An appropriately amended European energy efficiency policy, however, would lead to a much lower demand for emission allowances due to the intended lower electricity production. The market prices therefore had a strong negative reaction to these plans.

This trend was strengthened by the deepening debt crisis in the U.S. and Europe in the summer of 2011 and the associated negative economic effects. The front-year futures dropped below €7 by the turn of the year 2011/2012, recovered by the end of February 2012 again briefly to around €9.50 and finally sank to a level of around €8.20 (as of 29.06.2012).

#### **Info Box: Factors influencing the market prices in the EU-ETS**

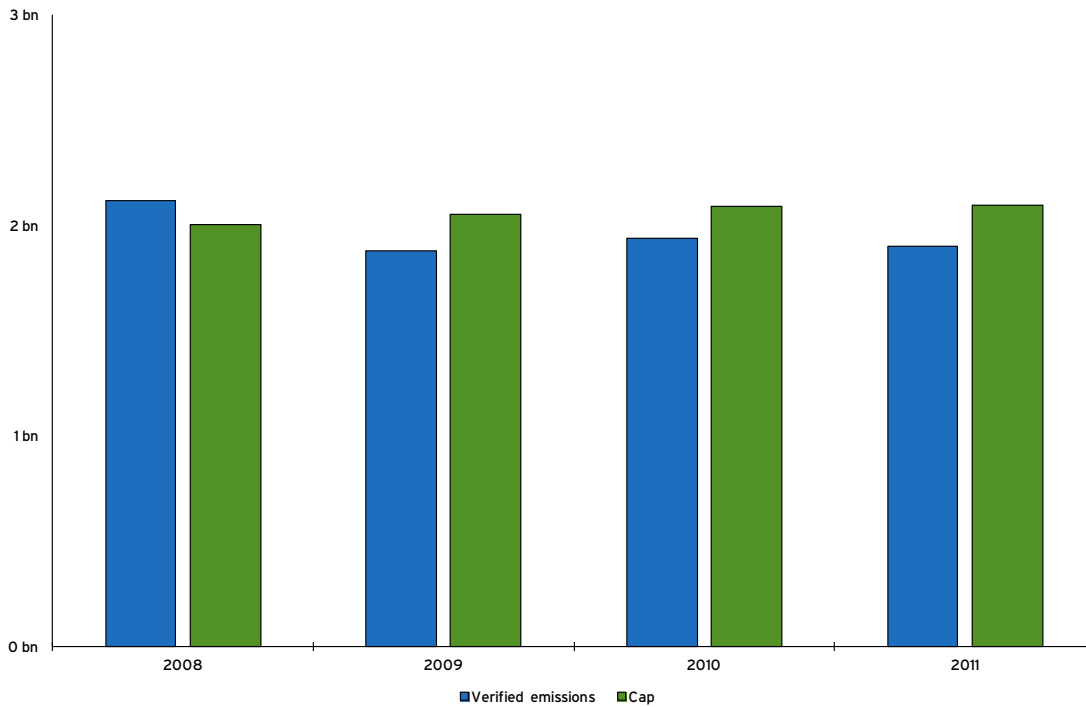
The progressive establishment of the carbon market has led to a detailed study of market prices and, in this connection, with the pricing of emission allowances. As in any other functioning market, the price of allowances is determined by supply and demand. Supply results from the amount of emission allowances which are available for the EU's Emissions Trading System and can be used to meet the surrender obligation of the operator (EUAs, CERs and ERUs). Demand in turn is determined by the amount of emissions in the EU-ETS.

There are now a large number of studies focused on the examination of relevant price determinants. Although the results may differ in the actual weighting of individual factors, there is generally relatively good agreement on the main determinants which may (also) affect the price of emission allowances over the short and long term:

- economic development/industrial production,
- political debates and decision-making processes,
- fuel prices/power prices,
- extreme weather conditions,
- availability and usability of the emission credits from project-based mechanisms (CERs and ERUs),
- share of renewable energies in electricity production,
- trade strategies of different market stakeholders.

The variety of both short- and long-term factors fundamentally impairs the predictability of market prices of emission allowances.

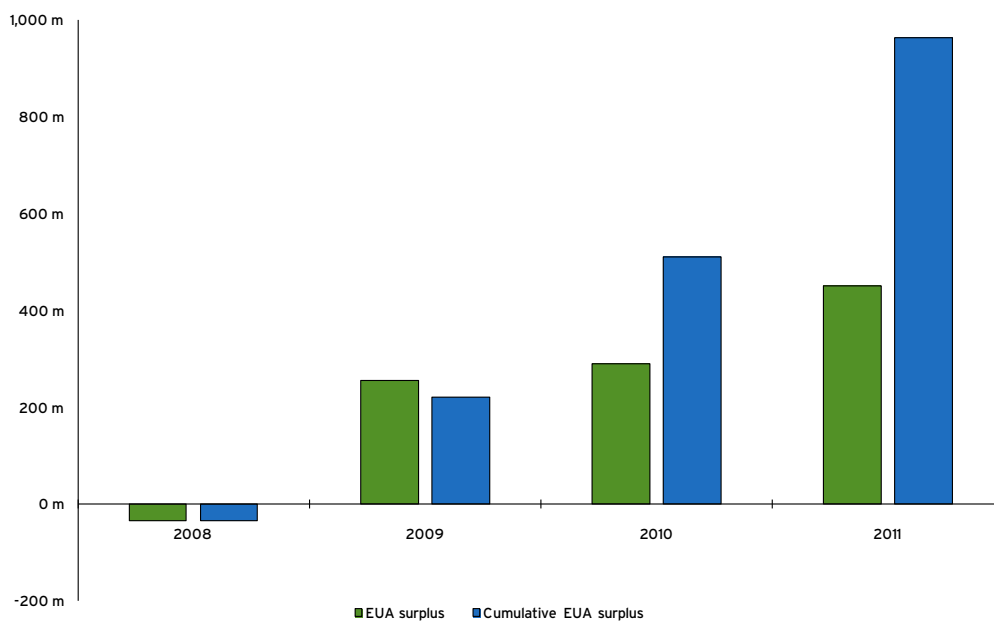
The above mentioned reasons resulted in a surplus of allowances for businesses within the EU-ETS; thus clearly contributing to the current market situation. Only in 2008, the actual emissions were above the level of the allowances issued (see Figure 23).



Source: EEA, COM, KfW, DEHSt

Figure 23: Verified emissions and available emission rights (2008-2011) (bn = billion)

According to calculations by the European Environment Agency (EEA), the EUA surplus in the EU-ETS accumulated to over 400 million allowances in the period of 2008 to 2011. In view of previously used additional emission reductions from project credits (CERs and ERUs), the cumulative surplus reached nearly 1 billion emission allowances (see Figure 24).



Source: EEA, COM, KfW, DEHSt

Figure 24: Surplus of emission allowances, including the use of CER/ERU (2008-2011) (m = million)

With the ability to transfer the surplus emission rights from the second to the third trading period („banking“), this situation will influence emissions trading until late into the third trading period, especially if no further political intervention takes place. In this regard, the European Commission has announced that it will submit a proposal in 2012.

## BRIEF PROFILE OF THE PUBLISHER

### BRIEF PROFILE OF UBA/DEHST

The German Emissions Trading Authority (DEHSt) at the Federal Environment Agency is the competent national authority to implement the market instruments of the Kyoto Protocol.

We aim to lead emissions trading to both ecological and economical success. Thus, we work in close cooperation with enterprises whose installations or aircrafts are subject to EU emissions trading and support the work of the verifying bodies. Furthermore, DEHSt is the contact point for the German Federal Ministry for Environment, the federal states, and the competent clean air authorities on the federal state level. On the national and international level, we work continuously on the development of emissions trading and the further integration of the Kyoto Protocol's project-based mechanisms (Joint Implementation – JI and Clean Development Mechanism – CDM).

DEHSt is also the „Designated National Authority“ (DNA) for CDM projects and the „Designated Focal Point“ (DFP) for JI projects regarding the approval of the respective climate protection projects. We communicate with our partners mainly electronically. This concerns the application procedure, the allocation of certificates, as well as the account management in the national registry, and annual emissions reporting. In 2006 DEHSt was voted “best virtual organisation” in the German eGovernment competition for public offices at federal, state, and local levels.

Further information: [www.dehst.de](http://www.dehst.de)

### BRIEF PROFILE OF KfW

The KfW is one of the leading and most experienced development banks in the world. It uses its knowledge and power for the sustainable improvement of economic, social and environmental conditions. Founded in 1948 as a public institution, the KfW now belongs to the Federal Republic of Germany (80%) and the States (Länder) (20%). With total assets of more than €450 billion, it is one of Germany's three biggest banks. As a bank with no branches or customer deposits, KfW refinances its development business almost exclusively on the international capital markets. This was more than €79 billion in 2011.

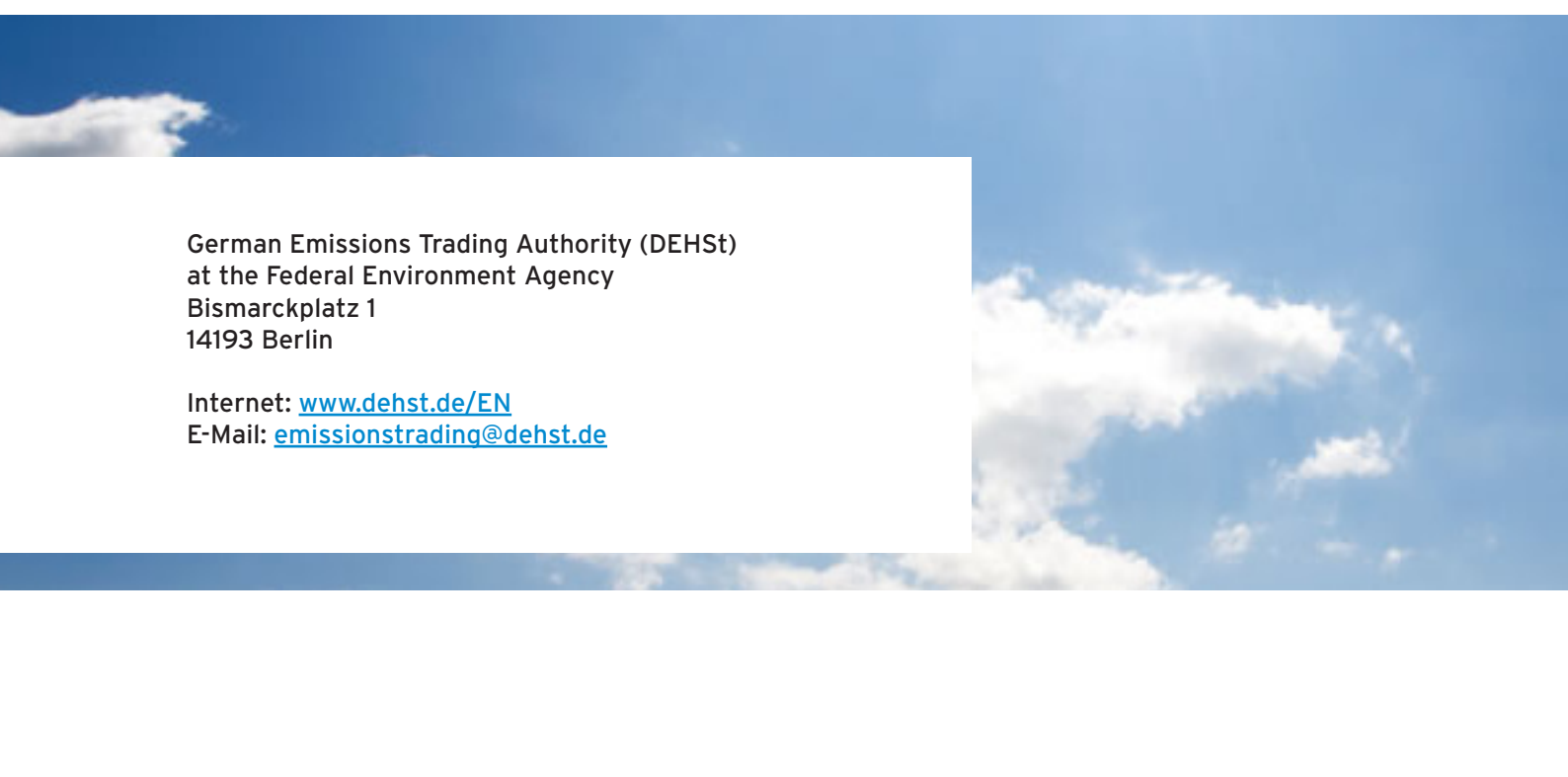
As a Government and States (Länder) development bank, KfW considers itself as having special a responsibility for environmental and climate protection. About one third of the development volume flows into this area. KfW is based on the principles of sustainable development and contributes to all three pillars of sustainability: economy, environment and societal cohesion.

Their key areas of work are:

- supporting small and medium-sized enterprises and start-ups,
- programmes for the housing industry, environmental protection and education support services for private clients,
- financing programmes for communes and regional development banks,
- export and project financing,
- support for developing and transition countries,
- loan securitisation.

Within the KfW, the Carbon Fund is responsible for all development activities and related transactions which are concerned with the Kyoto Protocol's flexible mechanisms and related instruments. Moreover, the Carbon Fund undertakes service functions for the Federal Government on emissions trading.

In cooperation with the ZEW, KfW has developed the KfW/ZEW CO<sub>2</sub> barometer to investigate the activities and expectations by German companies as well as international experts in European emissions trading. The overall results are published annually in the KfW/ZEW CO<sub>2</sub> barometer, individual results – such as price expectations – are updated quarterly in the KfW/ZEW CO<sub>2</sub> indicator.



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