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PBL Note

Evaluation of the European Commission's proposal to set aside emission allowances

Effects on the EU carbon price and Dutch
ETS companies

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Main conclusions

EC proposes adjusting the timing of auctioning emission allowances

The functioning of the EU Emissions Trading System (ETS) is under discussion, as current market prices of the allowances that permit the emission of CO₂ are far below expectations. Although emission reductions are currently delivered at low costs, the current price of around eight euros per tonne of CO₂ is considered too low to stimulate investments in low-carbon technologies. Such investments are necessary for deep emission reductions in the long run. The main explanation for the low CO₂ price is the economic stagnation in the European Union since the end of 2008. This stagnation caused emission levels to be much lower than expected, while the supply of allowances remained unchanged. This resulted in a vast oversupply of allowances which is likely to persist during the entire trading period up to 2020. To address this oversupply, the European Commission has proposed to reduce the amount of auctioned allowances by 900 million in the years 2013 to 2015 (temporarily set aside) and increase the allowances again by the same amount in the 2019–2020 period (back loading). PBL was asked by the Dutch Ministry of Infrastructure and the Environment to assess the impact of the EC proposal on the CO₂ price in the EU ETS and its effects on Dutch ETS companies.

CO₂ prices temporarily higher in case of substantial back loading

The impact of back loading allowances on the carbon price is likely to be limited, mainly because the total amount of allowances up to 2020 will remain unchanged. When only a small amount is back loaded (i.e. 400 million allowances), the carbon price in the ETS is not likely to move significantly. The price may even drop, as the current price level probably already reflects the adoption of significant back loading. When more allowances are back loaded (i.e. 1.2 billion allowances), a significant impact on the carbon price and possibly its volatility can be expected in the short term. The CO₂ price may end up slightly higher by 2020, as the adoption of back loading will be considered a signal that structural ETS reform, such as cancellation of allowances, are more likely to be adopted, as well. However, even a slightly higher CO₂ price would still remain far below the level that was anticipated when the ETS directive was adopted. Not adopting the EC proposal may result in a further decline in the CO₂ price.

Uncertainty for investors remains until structural reforms are announced

Back loading has probably no impact on investments in low-carbon technologies. Although carbon prices would increase, temporarily, the increase would be much too low to stimulate investments in low-carbon technologies. Moreover, investors may face some additional uncertainty as long as the current proposal is not transparent enough for them; for example, because criteria on repetition and quantification are unclear. However, investors also seem to regard the intervention in the form of back loading as an important indication that politicians take the necessity of an appropriate ETS price signal for long-term investment in low-carbon technologies seriously. They see adoption of the proposal as a signal that structural reforms (to be announced later in 2012) are more likely to be accepted.

Negative impact of back loading on ETS companies is likely to be limited

Although the carbon price is likely to rise, temporarily, when a substantial amount of allowances is back loaded, the negative impact on ETS companies, including those in the Netherlands, is probably limited. As power producers have no surplus from the 2008–2012 trading period and, in principal, no longer receive any free allowances, higher CO₂ prices may temporarily increase their production costs, especially over the 2013–2015 period when scarcity of allowances will be at its peak. However, power producers can pass all of the costs of allowances on to consumers (including industry), so the negative impact for the energy sector is expected to be limited. Industrial companies, however, can use the surplus of allowances, accumulated over the 2008–2012 period, to compensate for an increased scarcity of allowances. Also, they will continue to receive most allowances for free up to 2015 (carbon-leakage-sensitive industry even receives all of the allowances for free up to 2020).

As far as industrial companies are able to pass the costs of a temporarily higher CO₂ price and higher electricity bills on to consumers, this temporary rise could even increase their windfall profits in the short term. Although aircraft operators are expected to be short on allowances, the impact of back loading is likely to be limited. Costs to acquire allowances will rise only temporarily and decline in the subsequent years up to 2020.

Structural reforms necessary to stimulate investments in low-carbon technologies

Back loading, as such, will be insufficient to stimulate investments in low-carbon technologies. This requires a more structural reform of the ETS. Perhaps most important is the political signal that back loading sends out – implying that the functioning of the ETS is a priority for politicians, and increasing the likelihood of further reforms.

1 Introduction

Oversupply of credits on the ETS market

The functioning of the EU Emissions Trading System (ETS) is under discussion, because current market prices of the allowances that permit the emission of CO₂ are far below expectations. In April 2012, prices dropped to six euros per tonne of CO₂ and by November hovered around seven euros, whereas the European Commission expected prices to be around 30 euros at the time when the revised ETS directive would be adopted (EC, 2012a). Various market analysts from Point Carbon, Barclays Capital and Deutsche Bank expect prices to remain at a low level up to 2020 (Point Carbon, 2012a; Point Carbon – Carbon Market Daily 10 January & 11 July 2012). The main explanatory factor is the economic stagnation in the European Union since the end of 2008. As a consequence, emissions have been much lower than expected, while the supply of allowances has remained unchanged. This coincided with the new possibility of banking allowances left over from the second ETS trading period to use in the third trading period. These factors together contributed to the current lack of scarcity of allowances on the CO₂ market and explain the current low CO₂ price.

Environmental policy governed by principles of cost-effectiveness lies at the heart of the ETS and the lower carbon price merely reflects this fundamental principle. In other words, the carbon market seems to work well. If, however, the future is likely to differ considerably from the projections that were originally modelled at the time when the environmental constraints were set, this also indicates that reform may be warranted. For instance, a low price level of allowances may also imply that the real (marginal) cost of abatement had been overestimated considerably.¹ Indeed, the advantages of cap and trade could be much improved if its design would allow for adjustments that capitalise on new information which may be incorporated in unexpected price shocks; in particular, when ultimate environmental goals have not yet been achieved (Burtraw et al., 2010).

Political response to low CO₂ prices

A low CO₂ price is not problematic for the purpose of reducing greenhouse gases up to 2020. As emissions are being capped under the EU ETS, the scheme guarantees that emissions will have decreased by 21% by 2020, compared to 2005 levels. However, the purpose of the ETS is also to provide a strong enough price signal to stimulate long-term investments in low-carbon technologies². For this reason, the European Parliament, the European Commission and the majority of the Dutch House of Representatives have expressed their concern over the currently weak price signal of the ETS (EC, 2012b; EP, 2012; Dutch House of Representatives, 2011). In July 2012, the European Commission proposed an amendment to the ETS directive, explaining why the EC intends to adjust the timing of the allowances to be auctioned for the 2013–2020 period (EC, 2012b). The EC proposal aims to address the current oversupply of allowances by reducing the amount of auctioned allowances in the initial period (the remainder to be temporarily set aside), and adding these again to the amounts that are auctioned in subsequent periods (back loading). In November 2012, the European Commission proposed to set aside 900 million allowances over the 2013–2015 period, to be back loaded in 2019 and 2020 (EC, 2012c). Shortly after presenting this proposal, the European Commission published a report that reviews the functioning of the ETS and puts forward options for its structural reform (EC, 2012d). One of the options mentioned in the report is the permanent withdrawal of the set-aside allowances.

Aim, scope and methods of this publication

In order for the Netherlands to determine its position in the debate on the Commission's proposal to temporarily set aside allowances (i.e. a set-aside policy which includes back loading)

¹ Kelly and Vollebergh (2012) summarise these arguments in relation to policies that aim to address air pollution, drawing from the wide experience with tradable permits under US SO₂ and NO_x trading schemes.

² Creating a 'a carbon price signal necessary to trigger the necessary investments' is one of the considerations mentioned in the revision of the ETS directive from 2003.

the Ministry of Infrastructure and the Environment asked PBL to assess the impact of the proposal. This publication analyses the proposal's impact on the CO₂ price in the EU ETS and on companies that participate in the ETS, particularly in the Netherlands. The impact of a more structural reform of the ETS is not addressed in this publication, but will be addressed, separately, at a later stage. Our analysis has been based on a review of recent articles, policy documents, scientific literature and recent data from the Dutch Emissions Authority (NEa) and the European Environment Agency (EEA).

2 Functioning of the EU ETS and the proposed adjustment

2.1 Functioning of the ETS

The ETS is to stimulate both emission reductions and clean technologies

The EU Emissions Trading System is one of the most important instruments for European climate and energy policy. Roughly half of all European greenhouse gas emissions are capped under the EU ETS. Its main purpose is to reduce emissions in a cost-effective way. Also, the ETS aims to stimulate investments in low-carbon technologies. The first trading period, which ran from 2005 to 2007, was mainly intended as a pilot. This phase was characterised by a generous cap (the total amount of allowances exceeded the verified emissions by 2.3%) (Abrell et al., 2011). Because no banking was allowed, the CO₂ price dropped to zero. The current, second trading period runs from 2008 to 2012. The cap is aligned with the European emission reduction target as agreed under the Kyoto Protocol, and any surplus may be banked for use during the next trading period. At the beginning of this second period, companies mostly were short of allowances, explaining the carbon price of about €20. However, because the economic crisis reduced demand for allowances, prices began to fall in 2008 (to 15 euros) and again in 2011 (to 6 euros). The third trading period, running from 2013 to 2020, is part of the European Climate and Energy package, adopted in 2009. Overall ETS emissions will reduce with 21% through a linear reduction scheme between 2005 and 2020.

Allocation of allowances will change significantly after 2012

Several significant changes will be made to the ETS in the third trading period. First of all, more installations (mainly from industry) will be covered so that more greenhouse gases are subject to the ETS scheme. In particular, international aviation has been included in 2012. For that purpose, 213 million aviation allowances were added in 2012 and 209 million from 2013 onwards (EC, 2012e). Aircraft operators receive 82% of their allocated allowances for free, which are calculated using a CO₂ benchmark. Of the total amount of allowances available to aviation, 15% is auctioned and 3% is reserved for later distribution to fast growing airlines and new entrants. Secondly, there will be changes to the current free allocation of allowances to all participants in the ETS, which are based on National Allocation Plans drawn up by the Member States themselves. Power producing companies are required (with some minor exceptions) to buy all their needed allowances. The allocation of allowances to industrial installations will be based on European harmonised CO₂ benchmarks per type of product. The benchmark is determined according to the average of installations belonging to the most efficient 10%. Less efficient installations also receive fewer allowances, based on that benchmark, resulting in a stimulus to improve efficiency or to buy additional allowances. In 2013, 80% of the calculated allowances will be allocated for free. This figure will decrease to 30% by 2020 and to 0% by 2027. Industries that are vulnerable to competition from outside the EU, receive all of their calculated allowances for free because of the risk of carbon leakage. Overall, about half of the total supply of allowances in the third trading period will be auctioned.

Oversupply of allowances in ETS market up to 2020

The current oversupply of allowances has been built up from different sources and is expected to expand in 2012 to 2013:

- Oversupply of allowances in the ETS market up to 2011 was 406 million, excluding the use of credits from Clean Development Mechanism (CDM) and Joint Implementation (JI) projects (EEA, 2012);
- Assuming that 2012 will result in an oversupply similar to that of 2011, the oversupply will have increased further by roughly 200 million allowances by the end of 2012.
- In addition, unused credits from the New Entrants' Reserve over the 2008–2012 period are expected to be auctioned by Member States in 2012. The number of allowances is estimated at 125 million (EC, 2012a).

- The 2012 surplus will further include early auctioning of 120 million allowances (which will be deducted from the supply for 2013 and 2014), the auctioning of 30 million allowances for aviation, and the auctioning of 200 million allowances for the New Entrants' Reserve (NER300) programme³.

In total, this surplus will accumulate to roughly 1.1 billion allowances in 2012. Assuming maximum use of international credits⁴, the *total* surplus will amount to almost 2.5 billion⁵. This represents roughly 125% of new allowances in 2013, which is roughly 15% of the total supply of allowances over the 2013–2020 period. The fact that current allowance prices have not dropped to zero is likely to be explained by the possibility of banking unused allowances to use in the subsequent trading period, and because individual traders (in particular, those who are currently already short on allowances) want to hedge against future unexpected developments (e.g. a sudden recovery of the economy).

Figure 1 presents the baseline and reference scenarios (both accounting for the effects of the economic crisis), describing the carbon market during the third trading period according to the European Commission. Compared to the baseline, the reference scenario assumes additional national policies in order to attain the Effort Sharing Decision⁶ and Renewable Energy Targets by 2020 (EC, 2010). In the baseline scenario, these targets are not achieved on an EU level, resulting in higher (ETS) emissions. After 2013, the supply of allowances gradually will decrease as ETS caps decline with an annual reduction factor of 1.74%. Clearly, in the baseline scenario, a significant surplus of 1.5 billion will still be in the market by 2020. If additional national policies also are taken into account, surpluses by 2020 would even be as high as 2.3 billion. Moreover, this picture may even be an optimistic one, as, since 2010 (the time of this calculation), economic development has deteriorated even further and a new Energy Efficiency directive has been adopted which puts additional pressure on the demand for allowances.

³ In total, 300 million allowances from the New Entrants' Reserve (NER) for the third trading period will be monetised before the end of 2013, creating a fund that should stimulate CCS and renewable energy projects.

⁴ Limited at 1.4 billion credits for the 2008–2020 period, excluding the additional use by aviation and new entrants. Up to 2011, almost 550 million credits were surrendered for compliance by ETS companies (EEA, 2012). It is expected that the use of international credits will further rise in 2012, partly because of a further increase in supply, low prices and the ban of using certain types of credits from 2013 onwards.

⁵ This roughly corresponds with the oversupply of 2,325 million allowances up to 2012, estimated by the EC (2012a).

⁶ Decision 406/2009EC sets non-ETS emission caps for Member States

Figure 1

Surplus of emission allowances and credits in the EU ETS

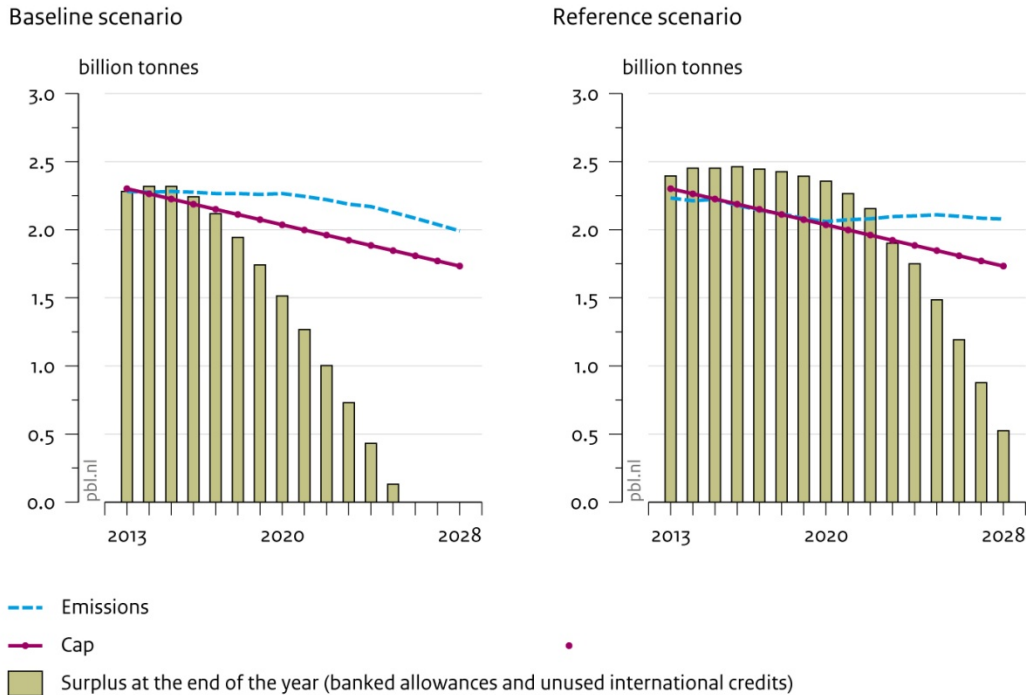


Figure 1. Surplus in the European Emissions Trading System
Source: EC (2012a)

2.2 Proposal to curb oversupply by back loading allowances

EC proposes back loading of allowances

In order to reduce the large surplus at the beginning of the third ETS trading period (running from 2013 to 2020), the EC proposes to withhold 900 million allowances during the auctions for the first three years. These allowances would then be auctioned in 2019 and 2020 (back loading). As such, the total supply of new allowances in the 2013–2020 period would remain unchanged (see Table 1). According to the EC, this would ‘improve the functioning of the market’. The proposal explains the details of the current EC mandate to adjust the auctioning timetable. The number of allowances temporarily to be set aside is to be determined in an amendment to the Auctioning Regulation. The proposed amendment to back load 900 million allowances was published after the EC suggested three variants in July 2012. The following variants were discussed in consultations: 400 million (representing a small change), 900 million (a medium change) and 1.2 billion (a large change). These variants are discussed in this paper, where the set aside of 900 million allowances compares to a medium change. Such temporary set aside could be turned into a more structural reform of the ETS if those allowances would never be allowed to be back loaded, and the intervention would change to become a permanent set aside (*Point Carbon - Carbon Market Daily 26 September 2012*). In that case, the total supply of allowances in the 2013–2020 period would be reduced. However, this scenario is not included in this paper.

Table 1

Total supply of EU allowances in the 2013–2020 period (millions, excluding aviation)

	2013	2014	2015	2016	2017	2018	2019	2020	total
Auctioning	1,056	1,044	1,092	1,080	1,067	1,055	1,043	1,031	8,468
Free allocation	862	837	813	789	765	741	717	693	6,217
New Entrants' Reserve	104	102	100	98	96	95	93	91	779
Total	2,022	1,983	2,005	1,967	1,928	1,891	1,853	1,815	15,464
Auctioning including back loading									
Large change (1.2 billion)	506	644	842	1,320	1,307	1,295	1,283	1,271	8,468
Medium change (900 million)	656	744	892	1,260	1,247	1,235	1,223	1,211	8,468
Small change (400 million)	856	894	1,042	1,160	1,147	1,135	1,123	1,111	8,468
Total supply including back loading									
Large change	1,472	1,583	1,755	2,207	2,168	2,131	2,093	2,055	15,464
Medium change	1,622	1,683	1,805	2,147	2,108	2,071	2,033	1,995	15,464
Small change	1,822	1,833	1,955	2,047	2,008	1,971	1,933	1,895	15,464

Source and back loading timetable according to three variants in EC (2012a).

Figures exclude NER300 auctioning, potential use of credits from CDM and JI projects and transitional free allocations to electricity producers. Including correction for early auctioning resulting in 60 million allowances less to be auctioned in 2013 and 2014.

Changing initial allowance allocation between 2013 and 2020

Although the total supply of allowances in the 2013–2020 period will remain unaffected by back loading, the annual supply of new allowances will be altered significantly. Without intervention, the total supply of initial allowances will peak in 2013, and slowly decrease towards 2020 (see Table 1). In case of back loading, fewer allowances will be allocated in the auctions, considerably reducing the overall supply of allowances during the 2013–2015 period. The supply will be considerably larger and at its peak in 2016, after which it will slowly decrease again, up to 2020, although it will remain at a level above that of 2013 to 2015. Clearly, with small packages, the supply of new allowances would be distributed more evenly over the whole period.

3 Effects of back loading allowances

3.1 Impact on carbon trade, volatility and CO₂ price

The CO₂ price reflects expectations about the future supply of and demand for allowances

The impact of back loading on the CO₂ price in the EU ETS depends on a large number of factors. In particular, carbon traders act on expectations about future developments in supply and demand. Supply factors typically depend on political choices with respect to the overall amount of new allowances (including the exchangeability with related products, such as Certified Emission Reductions from the Clean Development Mechanism (CDM) or Joint Implementation (JI)), but also on the willingness of other companies to sell their CO₂ allowances. Demand factors refer to prospects of future economic growth, developments in energy markets (regarding both fuels and electricity production) and changes in the broader set of energy and climate policies (e.g. support for renewables or energy efficiency policies). Indeed, the CO₂ price in the EU ETS typically reflects the balance of all expectations with respect to day-to-day changes as well as structural developments.

The average CO₂ price may rise slightly over the 2013–2020 period

The current lack of scarcity of allowances on the carbon market is likely to continue up to 2020. The reference scenario presented by the European Commission (Figure 1) also represents the view of other well-known market observers. A recent report by the Centre for European Policy Studies (2012) concludes that – despite some variance in assumptions, timing of the assessments and the resulting figures – wide agreement exists that, under the current EU wide 20% emission reduction target, the supply of allowances in the ETS will likely exceed demand up to 2020, and that there will effectively be no need for further abatement measures in the EU to achieve this target. For this reason, no significant impact is expected on the *average* CO₂ price over the 2013–2020 period, because the total amount of available allowances in the ETS market (including the surplus from the second trading period) would remain unchanged due to back loading.

However, the CO₂ price may increase in the 2013–2015 period if the scarcity of allowances increases. Although companies could compensate by using their banked allowances, they may also decide not to use this surplus for strategic reasons (such as expected scarcity in the long term). Companies without a surplus (most power producing companies) need to buy allowances and/or international credits on a more scarce market. The more allowances are back loaded, the more likely the CO₂ price is to rise. According to Point Carbon market analysts, back loading 400 million permits would have virtually no impact on current CO₂ price levels, but back loading 1.2 billion permits could result in a nominal CO₂ price of 14 euros per tonne by 2014 (Point Carbon, 2012a), comparable to the 15 euros expected by Deutsche Bank (*Point Carbon – Carbon Market Daily 11 July 2012*). This also fits a study by Bloomberg (2012) that projects a price range of 11 to 30 euros for 2015. The EC proposal to set aside 900 million allowances would likely result in prices somewhere between current prices and those of the higher forecasts. For the 2016–2020 period, the CO₂ price is expected to decrease when supply increases again.

Small impact on additional price volatility

Although the CO₂ price on average is unlikely to change significantly, back loading may lead to some additional volatility. With back loading, supply varies more from year to year. It is unlikely though that this additional volatility will have much of an impact because no studies expect prices that fall outside the range of the carbon price volatility being observed in the market so far (so called 'price collars'). The current uncertainty in the market with respect to structural market reform (see below) is likely to have a far greater impact.

The market already is anticipating the back loading of allowances

According to the efficient-market hypothesis, newly available information is likely to have an immediate impact on market expectations, and therefore, in turn, on prices. For instance, if firms really expect an impact of back loading, its impact may likely already be observed in the market. For instance, most power producing companies hedge their forward sales of electricity

with allowances up to three years ahead. Back loading influences the costs associated with this hedging strategy.

In fact, the CO₂ price (at around eight euros per tonne at the time of the EC proposal of 12 November 2012; currently around seven euros) already anticipates the adoption of back loading. Since the EC announced a proposal to restore confidence in the ETS in April 2012, the CO₂ price in the ETS already increased by 37% in June alone (*Point Carbon - Carbon Market Daily 11 July 2012*). By the time the EC published its plan on 25 July 2012 to back load allowances, the impact on the CO₂ price was only limited (or even negative in the first days after publication), probably because no further details about the amount of allowances to be back loaded were provided (*Point Carbon - Carbon Market Daily 25 July 2012*).

Furthermore, when it became known that the Dutch Government did not seem to support the EC proposal to back load allowances, the carbon price dropped by around 6% in two days (*Point Carbon - Carbon Market Daily 17 September 2012*). This news further increased uncertainty on whether the proposal would be backed by enough Member States. Moreover, Poland is resisting any attempt to increase CO₂ prices (*Point Carbon - Carbon Market Daily 19 September 2012*). Other eastern European countries also have reservations about the proposal, as the mandate for the EC would not be very clear (*Point Carbon - Carbon Market Daily 8 October 2012*). According to Point Carbon, the CO₂ price could even collapse to four euros per tonne in 2013 and average out at seven euros up to 2020 if the proposal for back loading would be withdrawn at this point (Point Carbon, 2012a). This scenario is supported by the fact that the CO₂ price dropped by 8% on the day following the publication of the EC proposal to set aside 900 million allowances. Apparently, traders expected a greater amount of allowances to be set aside (*Point Carbon - Carbon Market Daily 13 November 2012*).

Indeed, the adoption of back loading is also a signal that structural reforms are more likely to be adopted and, therefore, the proposal has even gained support from power companies in Europe⁷. For that reason, market analysts from Point Carbon expect the average CO₂ price over the 2013–2020 period to be slightly higher (around nine euros) with back loading than without it (around seven euros).

3.2 Impact on investments in low-carbon technologies

Little impact on investment decisions

Although back loading may result in slightly higher CO₂ prices, the level expected by market analysts remains far below the price of around 30 euros by 2020 that was anticipated at the time the revised ETS directive was adopted. Therefore, little impact can be expected from back loading on current decisions to invest in new power plants. A CO₂ price of around 15 euros in the 2013–2015 period would not even be enough to have much of an impact on fuel switching by power plants from coal to gas. At current fuel prices (October 2012), with coal prices being relatively low compared to gas, power producing companies in the United Kingdom may switch from coal to gas at a CO₂ price of 40 euros per tonne for the average power plant (range of 20 to 75 euros, depending on power plant efficiency; Point Carbon, 2012b). Because of high gas prices compared to coal prices and the price of imported electricity, power production by gas-fired power plants in the Netherlands during the first half of 2012 was at its lowest since 2001 (CBS, 2012). This indicates that fuel switching is also significant in the Netherlands. The price level of fuel and the expected CO₂ prices also contribute to the current lack of investments in gas-fired power plants in the whole of the EU, raising concerns about future capacity, in particular, at peak load times.

⁷ See, for example, the position of Eurelectric, who support back loading in the expectation that more permanent measures to strengthen the ETS will be proposed (Eurelectric, 2012)

Intervention in the ETS influences regulatory uncertainty

An average CO₂ price of below 10 euros per tonne, up to 2020, is too low to invest in low-carbon technologies, such as wind turbines and solar panels (Smekens et al., 2011)⁸. Investments in low-carbon innovative technologies are generally also more capital-intensive, requiring a relatively stable investment climate over a longer time horizon in order for investments to become economically feasible (PBL/ECN, 2011). Back loading may have an impact on the investment decisions of ETS companies in two opposing ways.

On the one hand, uncertainty may increase for investors as there is no guarantee that interventions will be limited to this instance of back loading. In the past, the EC already intervened in two instances; by banning certain types of CDM credits, and by the decision of auctioning allowances prior to the start of the third trading period. Also, the EC has announced it will propose a *Carbon Market Report* that reviews the functioning of the ETS at the end of 2012, to start a debate on a more structural reform of the ETS. The result of these regulatory interventions is that investments in clean technologies may be postponed in anticipation of further policy interventions (Grubb, 2012). The European business association Business Europe does not support back loading as this would increase uncertainty and price volatility (*Point Carbon - Carbon Market Daily, 8 February 2012 and 8 October 2012*).

Adopting back loading could serve as an indication of further reforms

Adoption of the proposal of back loading by Member States and the European Parliament, on the other hand, is also an indication of politicians being serious about ensuring that the ETS achieves its goal to stimulate low-carbon technologies. In that case, the prospect of increased scarcity and increasing CO₂ prices may build up in the market. The European association of power producers, Eurelectric, therefore supports back loading in the expectation that structural reforms will follow (Eurelectric, 2012). Other associations, such as the International Emissions Trading Association and the Climate Markets & Investment Association are also in favour of structural reforms (*Point Carbon - Carbon Market Daily 9 October 2012*). However, whether more structural interventions will be adopted and to what extent, remains uncertain.

3.3 Impact on Dutch companies in the ETS

Emissions from Dutch energy and industrial sectors are expected to increase

According to a recent forecast, emissions from the energy and industrial sectors will increase significantly, from 100 Mt CO₂ in 2010 to 118 Mt by 2020 (Verdonk and Wetzels, 2012). This will mostly be due to increasing power production, especially by newly built coal-fired power plants. Industrial energy consumption also is likely to increase due to the economic growth that is expected in the long term. Emissions from refineries are expected to increase due to higher quality standards for fuels and the processing of heavier crude oil, leading to higher energy consumption by refineries. Although the emissions for the 2013–2015 period were not explicitly examined by Verdonk and Wetzels, the overall trend is that of generally increasing emissions up to 2020. This implies a gradual increase in the demand for allowances, as well. Emissions from international aviation also are expected to increase, significantly, in Europe (EC, 2011) and, due to a lack of country-specific information this is assumed to also apply to the Netherlands.⁹ Against this background, we assessed the potential impact of a temporary rise in CO₂ prices (due to a significant amount of allowances being back loaded) on ETS companies in the Netherlands. However, it should be noted that all sectors already are benefiting from the currently much lower than expected carbon price.

⁸ There is reduction potential below 10 euros per tonne of CO₂ in the Netherlands (mostly energy savings) but other more dominant (non-financial) barriers for implementation exists. See, for example, CE Delft's report 'Halvering CO₂-emissie in de gebouwde omgeving' (in Dutch).

⁹ Kolkman et al. (2012) assume an annual growth of 3.5% (tonne kilometers).

The energy sector has been undersupplied, while industry has been oversupplied with emission allowances

An oversupply of allowances that was built up during the 2008–2012 period is likely to already compensate ETS companies for a potential, upward pressure on the CO₂ price due to the temporary, lower supply of allowances to be auctioned. ETS companies in the Netherlands received an oversupply of 5 million allowances in the 2008–2011 period (see Table 2). This over-allocation is likely to continue in 2012, reaching an estimated 9 million allowances (excluding CDM/JI credits)¹⁰. The total surplus up to 2011 was more than 13 million allowances, if credits from CDM and JI are also taken into account.

The differences across sectors are remarkable, however. The energy sector is nearly 12 million allowances short (including surrendered CDM/JI credits). In contrast, all industrial sectors together built up a total surplus of 25 million allowances up to 2011 (including surrendered CDM/JI credits)¹¹. This equals close to 75% of 2011 emissions from industrial ETS companies in the Netherlands. The extent to which these companies have already sold their surplus allowances is unknown, as this depends on their individual circumstances and expectations. The Dutch situation is not unique in Europe. Generally speaking, all ETS sectors together are being oversupplied with allowances (406 million up to 2011), but power producing companies are under-supplied, while most industrial sectors are being oversupplied (EEA, 2012).

¹⁰ Verdonk and Wetzels (2012) mention an over-allocation of 25 million, but this includes 16 million allowances auctioned in the 2008–2012 period by the Dutch Government. As the buyers are unknown, these allowances were not included in the allocation surplus in Table 2.

¹¹ Including the transfer of allowances from Tata Steel to Nuon Power, estimated at 16 million allowances for the years 2008 to 2011. Nuon Power fuels power plants with gas produced by Tata Steel. This results in lower emissions for Tata Steel and higher emissions for Nuon Power.

Table 2

Surplus in Dutch ETS sectors for the 2008–2011 period (in millions of allowances and/or credits)

<i>Sector</i>	<i>Allocation of free allowances</i>	<i>Emissions</i>	<i>Allocation surplus</i>	<i>Surrendered CDM/JI credits</i>	<i>Total surplus</i>
Energy production & distribution	159.0	188.4	-29.3	1.7	-27.6 ¹
Oil refineries	47.4	44.8	2.6	0.5	3.1
Chemical industry	47.5	40.7	6.8	1.9	8.7
Metal production	44.9	24.7	20.2	1.9	22.1 ¹
Other	35.5	30.7	4.8	2.4	7.2
Total	334.3	329.2	5.0	8.4	13.4

¹ Excluding the transfer of allowances by Tata Steel (metal production) to Nuon power plants in Velsen and IJmuiden (estimated at roughly 16 million in the 2008–2011 period), resulting in a surplus of 16 million less for the metal producing industry and 16 million more for the energy sector.

Source: Dutch Emissions Authority (2012)

Electricity sector more exposed to higher CO₂ prices

Power producing companies were not only already short of allowances during the second trading period, they also no longer will receive free allowances in the third trading period. Therefore, these allowances must be bought at auction or on the carbon market, and they no longer benefit from the implicit subsidy in the form of freely allocated allowances in the 2nd trading period (Bovenberg and Vollebergh, 2008).¹² The extent to which *individual* power producing companies will actually buy emission allowances at auction or on the carbon market depends on their expected emission levels, and in this respect it is irrelevant whether these emissions would occur in the Netherlands or in any of the other ETS countries. Moreover, allowances may be acquired at any of the auctions to which the power producing companies have access, as well as from the European carbon market. Finally, it is also quite likely that they already have hedged against price increases for emissions in the 2013–2015 period, facilitated by the early auctioning of 120 million phase 3 allowances in 2012. Indeed, most power producers safeguard their forward sales of electricity with allowances up to three years ahead.

The somewhat higher CO₂ price expected for the 2013–2015 period, due to back loading, would lead to somewhat higher production costs for utility companies participating in the ETS. This impact will be very minor, however. The additional cost of hedging due to back loading has already been priced into the market. CO₂ prices have increased since the EC announced to come up with proposals to reform the ETS (April 2012). If a substantial amount of allowances are back loaded, prices are expected to increase further, in the 2013–2015 period. Moreover, hedging against price increases related to emissions associated with the delivery of electricity after 2015 will be less costly, as the CO₂ price is expected to be lower in the 2016–2020 period than without back loading.

Finally, power producing companies would be able to fully pass higher costs due to back loading on to their customers¹³ (Sijm et al., 2008; Fell et al., in preparation). Power producing companies supply almost the entire European market and do not have to compete with non-EU power producing companies. The loss of demand is expected to be negligible as the CO₂ price increase suggested by market analysts will be limited and the price elasticity for electricity

¹² Freely allocated allowances provide an incentive to expand production capacity in order to obtain additional, valuable allowances (see Bovenberg and Vollebergh, 2008).

¹³ Not only end-consumers but also industry

demand is low. Therefore, the negative impact of back loading on the energy sector is likely to be limited.

Limited demand from industry for auctioned allowances

Although, at this stage, it is unknown if industrial sectors will receive more allowances than needed in the coming years, there will hardly be any necessity for industrial companies to buy allowances at auction in the 2013–2015 period. First of all, they have already built up a large surplus from the past (see above). Secondly, most of the allowances that were calculated using CO₂ benchmarks are still to be allocated for free in that period (remember this figure declines from 80% in 2013 linearly to 66% in 2015). In addition, the exposed industrial companies (those that compete with non-EU competitors) will receive *all* of their calculated allowances for free up to 2020, in order to avoid the risk of carbon leakage. This is specifically the case for most energy-intensive industrial companies in the Netherlands (Ministry of IenM, 2012). If individual industrial companies nevertheless would be short of allowances, for instance because they do not belong to the top-10 most efficient producers, they could buy additional allowances at auction.

Industrial companies could benefit from back loading if costs can be passed on

If back loading, temporarily, would lead to higher CO₂ prices (as suggested by market analysts), the opportunity costs for companies would increase, but so would the value of the subsidy (by an equal amount). Thus, industrial sectors could even benefit from back loading as this would lead to a slightly higher average CO₂ price up to 2020. This benefit largely depends on whether this higher CO₂ price could be passed on to consumers. The Dutch iron and steel sector, refineries and the chemical industry, are all sectors deemed to be exposed to the risk of carbon leakage. Nevertheless, all have seemed able to pass a certain amount of their costs on to consumers, over the 2005–2008 period (De Bruyn et al., 2010a). Windfall profits during that period for these industrial companies amounted to up to 14 billion euros, and there is no indication that this practice will be very different in the third trading period (De Bruyn et al., 2010b). This means that potential windfall profits (generated from the sale of freely obtained allowances) could end up slightly higher than without back loading. Furthermore, on average, the costs of industrially consumed electricity are likely to rise slightly. However, similar to the opportunity costs of allowances, it seems likely that the higher costs of electricity for these companies could also partly be passed on to their customers.

Impact of back loading on aircraft operators only limited

The back loading proposal has no direct impact on the supply of aviation allowances. However, aircraft operators are expected to have to buy additional allowances for the 2013–2020 period, because the increase in emissions is unlikely to be covered by the envisaged allocation of allowances (which will be 95% below average emissions in 2004 to 2006). Moreover, they also lack a surplus from previous years. Because of back loading, the costs of acquiring allowances for them will rise up to 2015, and decline in the following years.

Aircraft operators receive most of their allowances for free; therefore, this already compensates for the costs of additional allowances – something that is important for this exposed industry. Indeed, due to international competition, aircraft operators will not be able to fully pass on the CO₂ price (Morell, 2009; Bloomberg, 2011). Bloomberg expects that, in the short term, about 30% of the CO₂ price may be passed on, and that this will increase to about 60% by 2020. Therefore, if CO₂ prices rise over the 2013–2015 period and subsequently decline again up to 2020, back loading will reduce the windfall profits of aircraft operators. Even if costs would be fully passed on, the impact on airline traffic (cargo and passengers) would be limited as the average CO₂ price up to 2020 is expected to remain below 10 euros per tonne of CO₂¹⁴.

¹⁴ Compared to a situation without ETS, a CO₂ price of 10 euros per tonne would result in 0.9% less passengers in the EU (with costs being fully passed on) (Kolkman et al., 2011). For Amsterdam Airport Schiphol, this would imply 1.6% less passengers.

Impact of back loading on consumers and government

Whenever the costs of higher CO₂ prices are passed on to consumers, ultimately, the end-consumers will pay the (slightly) higher prices for products and services, although they already have been benefiting from the much lower than expected current CO₂ prices. However, the long-term impact of back loading is very limited, as the average CO₂ price may rise only slightly. For governments, back loading may have an impact on auction revenues and subsidies required for renewable energy projects. Back loading is not likely to lead to a significant change in the total revenue from auctions up to 2020. However, back loading may change annual revenue flows. Not adopting the back loading proposal may result in lower revenues, as in that situation CO₂ prices are expected to drop further. The slightly higher CO₂ price, however, is also likely to result in a slightly higher electricity price, which in turn would make low-carbon technologies, such as renewable energy, more competitive and thus reduce the need for subsidies.

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