ISSUE BRIEF

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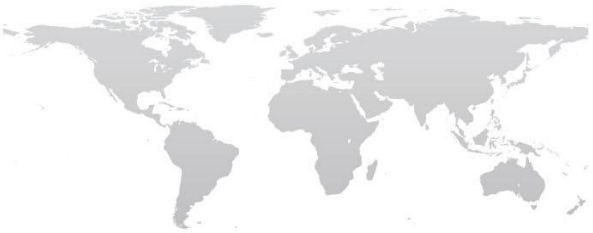

January 2014
Issue Brief 14-02

Resources for the Future

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A Price Floor Solution to the Allowance Surplus in the EU Emissions Trading System

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1. Introduction

Since 2008 there has been a rapid buildup of emissions allowances for carbon dioxide (CO_2) in the European Union Emissions Trading System (EU ETS), resulting in a surplus of 2 gigatons, which is in the range of the yearly emissions covered by the scheme (EC 2012). The EU Commission identifies several factors as explaining the large surplus: the economic downturn; banking of leftover allowances from phase 2; an early auctioning of phase 3 allowances to the power industry and to finance carbon-efficient technologies; and a strong and unexpected influx of certified emissions reduction credits under the Clean Development Mechanism (EC 2012). As the surplus has grown, the price of EU allowances had fallen to €2.81 in April 2013, but it subsequently recovered somewhat to €4.61 by October 14 (Guardian 2013; Point Carbon 2013). For comparison, the EU has estimated that reducing emissions to levels consistent with reaching the 2-degree target would require a carbon price of at least €32–€63 by 2030 (EC 2011). A persisting low carbon price in the EU ETS inhibits low carbon innovation and investments and poses a risk of lock-in of carbon-intensive industrial infrastructure. Without a policy intervention, the problem is expected to persist beyond 2020, prompting some observers to

Key Points

- The European Union carbon market is threatened by an oversupply of emissions allowances, leading to low prices.
- One option to stabilize the market is to introduce a price floor implemented as a reserve price in allowance auctions.
- A price floor has proven to be a valuable feature of the three existing trading programs in North America.
- A price floor promotes these markets and boosts the confidence of participants, investors, and innovators.

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describe this as a lost decade for the EU with respect to its climate goals (Eurelectric 2013).

The problem also has a strategic dimension. The low price on carbon may lead member states to introduce complementary policies in order to meet national climate objectives. For instance, the UK has introduced a carbon price floor on electricity generation facilities already covered by the EU ETS (UK Parliament 2013). In the rest of the EU, this action places downward pressure on the price of allowances. If similar actions were taken by other member states, the demand for EU allowances would be further reduced. Such policy fragmentation would cause the effective marginal cost of emissions reductions to differ over Europe, with consequent distortion of competitiveness (EC 2013). Further, the auction revenues are much lower than expected, which limits the availability of financing for carbon-efficient technology. Given these developments, the role of the ETS as the central pillar of EU climate policy is put at risk.

This paper provides a survey of policy responses under consideration and brings into focus the option of introducing a price floor. Three CO_2 emissions trading programs—the northeastern US Regional Greenhouse Gas Initiative (RGGI) and those of California and Quebec—each have a price floor that is implemented as a minimum acceptable bid (reserve price) in auctions for emissions allowances. In each program the price floor has been binding in least one auction. It is widely viewed as a successful design feature that has stabilized prices and enhanced environmental outcomes, and in one program it prevented a collapse of the trading market as a result of serendipitous changes in the power system outside the market.

2. The EU Response to the Oversupply of Allowances

To address oversupply in the EU ETS, the auctioning of 900 million allowances will be postponed to the end of phase 3, called *backloading* of the planned allocation. However, because this measure would change only the allocation time path, but not the total number of allowances in phase 3, the commission has presented six structural options to address the oversupply of allowances on a long-term basis:

a) increasing the EU reduction target to 30 percent in 2020;
b) retiring a number of allowances in phase 3 on a permanent basis;
c) revising early on the linear reduction factor that defines the annual change in the emissions target;
d) extending the scope to other sectors;
e) limiting access to international credits; or
f) using discretionary price management mechanisms.

Each of these options has some virtue, but the first five may be less cost-effective and more disruptive than option f and the introduction of a price floor. Option b is perhaps the most direct action, as it addresses only the oversupply without (directly) affecting other targets, sectors, and instruments. However, such changes in the design of the scheme would create uncertainty for investors and might inhibit actions instead of incentivizing them. If it is used now, one might conjecture that a similar action might be used again in the future (Zetterberg et al. 2013). Earlier research has shown that uncertainty can cause firms to delay investments (Hassett and Metcalf 1993, 1995; Purvis et al. 1995; Löfgren et al. 2008), and hence the effect of abruptly withdrawing allowances might not be as clear as expected.[2]

Increasing the emissions reduction goal from 20 to 30 percent (option a) was a possibility the EC identified in preparation for the UNFCCC Conference of Parties in 2009, if other parties committed to comparable actions. Therefore, such a measure would not be entirely unanticipated; however, because other parties have not made such commitments, the decision would come as a surprise to the market. Also, the market is somewhat prepared for option c, as the current reduction factor of 1.74 percent is not enough to reach the EU's long-term intention of an 80 to 95 percent reduction in emissions. In fact, the directive provides for the possibility of revising this reduction factor (EC 2009).

Option d would expand the scope of the ETS to include land transportation, which may increase cost efficiency. But consultations (EC 2013) identified concerns that including transportation would increase the allowance price in an uncontrolled way, with consequent risks of carbon leakage that would affect industrial sources already covered under the ETS. Option e would limit access to international credits (the credits that already are in circulation presumably would be protected). This action would reduce cost efficiency and have negative effects on sustainable development in countries providing these credits to the EU.

Option f suggests the use of a price management mechanism. Since the commission report was published, discussions have progressed in the direction of introducing a mechanism that would "park" allowances in a reserve and release them to the market to maintain the total number of allowances in circulation in a given year within a prescribed band (Taschini 2013; Fortum 2013).[3]

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[2] A similar approach was implemented in the program review of RGGI, where allowances that were unsold at the price floor were permanently retired. In that case the decision was less abrupt because the program rules were ambiguous about what would happen to those allowances. Further, this action strengthened the allowance price and positively affected the value of banked allowances held by private parties, thereby rewarding early action.

[3] In the California trading program, allowances not sold at the price floor are withheld from the market until the price floor is exceeded for two consecutive auctions and then are incrementally added back into the market (http://www.arb.ca.gov/cc/capandtrade/finalregorder.pdf; Section 95911(b)(4) on page A-129).

Another alternative is the introduction of a price floor. Unfortunately, this option has received little attention. One reason may be that a price floor has been mischaracterized as a tax, an instrument associated with political difficulties historically (Wråke et al. 2012). The commission states that an explicit carbon price objective would alter the very nature of the current EU ETS being a quantity-based market instrument (EC 2012). However, a price floor is not a tax. If the program is well designed, the price floor should bind rarely if at all. In fact, if the price floor binds consistently, it may be taken as a signal to trigger a program review to fix structural problems in the program while preserving the value of early actions. Further, not all sources have to pay the floor price when it does bind. Some portion of the market including industry may receive allowances for free. The value of that allocation is reinforced by the price floor in the auction. The merits of a price floor are well documented in the academic literature, and we argue that this mechanism deserves more attention as an option to abate the current crisis in the EU ETS.

3. The Merits of a Price Floor

The stringency of a cap (i.e., the total number of allowances) and the price in an emissions trading scheme are integrally related. The arguments for having price management mechanisms (also referred to as cost management mechanisms) has to do primarily with uncertainty regarding the marginal costs of reducing emissions but also with other uncertainties associated with external shocks to the system. The possibility of introducing a price cap to safeguard against (very) high allowance prices has been discussed and debated in the EU since the start of the scheme. A control mechanism to guard against unacceptably high prices and price volatility currently appears in the directive,[4] under the heading "Measures in the Event of Excessive Price Fluctuations," but the merits and benefits of a price floor have been much less discussed, and no explicit mechanism exists to guard against a fall in price.

In fact, this focus on higher-than-expected costs (and hence high allowance prices) is in sharp contrast to what has been observed in practice. In almost all previous cap-and-trade programs, the costs to firms have been overestimated ex ante rather than underestimated (Harrington et al. 2000; Burtraw et al. 2010). The typical scenario witnessed repeatedly in market-based regulation of air pollution is an initial high price as compliance entities build a modest allowance reserve, identify abatement options, and learn to trust the market, followed by a precipitous decline in price. The EU experience with low allowance prices has been shared by earlier trading schemes

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[4] "If, for more than six consecutive months, the allowance price is more than three times the average price of allowances during the two preceding years on the European carbon market, the Commission shall immediately convene a meeting of the Committee established by Article 9 of Decision No 280/2004/EC." http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0063:0087:EN:PDF.

such as the sulfur dioxide and nitrogen dioxide trading programs in the United States and the subnational programs for CO_2 in the Northeast and California.[5]

The obvious way to implement the price floor is to introduce a reserve price in the auction of allowances, as long as a sufficient portion of the total allowance allocation is sold through an auction (Hepburn et al. 2006). Just as in many online auctions, the reserve price represents a minimum acceptable bid. The academic literature and notorious examples of failed auctions point to a credible and efficient reserve price as an important feature of good auction design (Binmore and Klemperer 2002; Ausubel and Cramton 2004). If the market clearing price were to fall below the price floor, some portion of allowances automatically would not be sold in the auction, thereby restricting the supply of allowances and supporting the market price.

Given an unpredictable price path, Burtraw et al. (2010) find that a price floor independently or in combination with a price cap significantly improves welfare and the performance of a trading program. If the allowance price is lower than expected, this would indicate emissions reductions are less expensive than anticipated. Assuming policymakers initially designed the program with a rough balancing of benefits and costs in mind, the realization of a low allowance price should trigger the desire to purchase greater emissions reductions. A price floor is a rule that allows policymakers to embed such instructions in the program.

Another important aspect of the price floor is its potential to reduce uncertainty for investors regarding expectations of future allowance prices. If implemented in phase 4 of the EU ETS, starting in 2020, a price floor would be likely to influence the minimum price for the later years of phase 3 because of the opportunity for banking (Neuhoff et al. 2012). It is noteworthy that a price floor has two effects: it can be expected to reduce the variance in allowance prices and to increase their expected value, both of which have a positive influence on the decision to invest in low-emitting technologies. In addition, a price floor would reinforce auction revenues for recirculation in low-carbon innovation and address the risk of member states introducing complementary policies that undermine the functions of the ETS.

4. Concluding Remarks

One of the most challenging issues in the design and implementation of market-based approaches to regulation is managing uncertainty. This uncertainty stems from new information about both the benefits and costs of emissions reductions. Updating a program to assimilate new scientific information about benefits may take years as science and economic research move toward

[5] The exception is the RECLAIM program in southern California, which is the only important program that did not allow emissions banking. Unfortunately, the ramp up of stringency of that program coincided with a disruption in the California electricity market. The lesson from this is that any poorly designed program can fail. Cost management is a design element that, although one hopes it would not be invoked, would provide a safeguard against such a failure.

consensus. However, a revolutionary aspect of a cap-and-trade policy is that the regulator has instantaneous information about marginal cost, summarized in the allowance price. A rule-based approach such as a price floor can automatically adjust the stringency of the program in response to new information about costs without waiting for administrative action. Such adjustment is transparent. In contrast, the EU is currently considering abrupt withdrawal of allowances or change in the balance of supply and demand in the EU ETS, which would induce new policy uncertainty. We argue that the introduction of a price floor in the EU ETS would provide a nondiscretionary, rule-based approach that can be anticipated by market participants and thus would have a positive effect on investments in nonemitting technologies and increase the overall welfare of the program.

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