



# Consignment auctions of free emissions allowances



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## ABSTRACT

While the initial distribution of emissions allowances is usually thought to be independent of the emissions outcome, free allocation can affect the efficiency and fairness of allowance trading. Inefficiency may result from thin allowance markets, poor price discovery, and regulatory or organizational complexities that hinder the recognition of opportunity costs. Concerns about fairness may result from intransparency in the process of transferring substantial allowance value. We explore the role of consignment auctions in mitigating these concerns. These revenue-neutral auctions return the financial value of allowances to their original holders while revealing prices and directing allowances to their highest-valued use. They also can be used to support a minimum price when allowances are freely distributed, which may facilitate program linkage. Consignment auctions have minimal administrative costs and do not necessarily involve government. Experience indicates that they can play an important role, especially in new markets.

## 1. Introduction

Emissions allowance trading is becoming an increasingly relevant policy mechanism as jurisdictions plan for compliance with their climate-related, nationally-determined commitments under the Paris accord. These policies establish an emissions budget (cap) for a set of sources and issue emissions allowances for each allowable unit of carbon dioxide (CO<sub>2</sub>). Emitting firms must surrender allowances corresponding to the quantity of emissions they produce in each period. Firms are expected to search for the lowest-cost way of complying with the emissions budget by reducing emissions and by buying or selling allowances.

An important feature of emissions allowance trading is the initial distribution of allowances. Allowances have been allocated to entities for free in many previous North American emissions trading programs for various pollutants and in the EU Emissions Trading System for CO<sub>2</sub>. Sometimes this is done with the rationale of providing compensation to the affected industry or achieving political buy-in. Auctions are often used alongside free allocation to distribute allowances. However, while auctions have become the dominant approach in these existing programs (Burtraw and Sekar, 2014), free allocation continues to be

prevalent and is a feature of the expected cap-and-trade program in China, which will be the largest in the world when it takes effect in the next couple of years (Duan, 2015). Free allocation is also a feature of the trading program in the Republic of Korea, which will phase in an auction slowly over time, the trading program in the City of Tokyo, and other programs.

The emissions outcome, under certain conditions, is thought to be independent of the initial distribution of emissions allowances (Montgomery, 1972; Hahn and Stavins, 2011).<sup>1</sup> Depending on the context, however, free allocation can influence the efficiency of allowance markets.<sup>2</sup> Experience indicates that firms receiving a large allocation relative to their compliance needs may engage in fewer transactions, possibly resulting in a thin trading market and hindering the clear identification a market price. This, in turn, may prevent firms from recognizing the opportunity cost of using emissions allowances and from engaging in efficient trades. These factors may raise the cost of emissions trading programs and undermine their long-term success.

Allocation decisions may also affect the perceived fairness of allowance markets. Firms that do not receive free allocation or are new to the market may worry that allowances will not be available. In addition, under free allocation the initial distribution of allowances

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<sup>1</sup> The “independence property” in standard economic theory implies that in an efficient market with well-designed property rights, emissions should be independent of the initial allocation. Other studies support or do not reject the independence property (Reguant and Ellerman, 2008; Fowle and Perloff, 2013). In a laboratory experiment, Murphy and Stranlund (2005) find that net sellers of allowances tended to sell fewer allowances than would be expected in an efficient market and had fewer compliance violations than net buyers. If used as a production subsidy, allowance distribution can be used to change the distribution of emissions across regulated sources without changing the overall level of emissions from these sources (Fischer and Fox, 2007; Burtraw et al., 2015).

<sup>2</sup> The public finance literature has focused on the general equilibrium advantages of raising revenue through the sale of allowances in order to decrease other taxes in the economy (Goulder, 1995); however, we do not consider revenue-raising options in this paper.

affects who bears the burden of the program. However, the assignment of substantial wealth that occurs with allowance allocation is often masked in the administration of a program. Transparency of allowance allocation and the process by which this allocation is determined will influence perceived fairness and is ultimately valuable to the success and durability of the program.

In this paper, we explain how consignment auctions may offer a simple, virtually zero-cost, market-based remedy that mitigates many of the issues that may surface with free allocation. A consignment auction is a small, revenue-neutral addition to the design of an emissions market. Recipients (regulated firms or other parties) of free allowances are required to submit them to an auction. Based on the auction-clearing price, the original holder of consigned allowances is fully reimbursed by receiving revenue from the auction equal to the allowances submitted multiplied by the auction price. The entity may choose to buy allowances in the same auction and would pay a net-zero price on allowances it sells and repurchases. Hence, in a consignment auction, the initial holders of emissions allowances capture all the value of allowances originally allocated to them for free and they have the opportunity to acquire allowances they require for compliance. Because entities make and lose no money from allowances they sell and repurchase, the importance of a consignment auction in the design of an emissions market may be unintuitive. However, by ensuring that some or potentially all allowances enter the market, this approach improves the transparency of the program, the functioning of the market, and the ability of firms to recognize and act upon the least expensive opportunities for compliance.

A consignment auction is simple to run at minimal administrative costs for all parties, and the government does not need to be involved. In fact, in the first decade of the US sulfur dioxide (SO<sub>2</sub>) trading program consignment auctions were run by the Chicago Board of Trade at zero cost, and two other firms also offered to run the program for free. In California, the CO<sub>2</sub> consignment auction is run independently by the Western Climate Initiative, Inc. It provides a straight-forward way to introduce a minimum price to a trading program even with free allocation, which can facilitate linkage with other programs.<sup>3</sup> Compared to a revenue-raising auction that might require legislative authorization, the revenue neutrality of the consignment auction and its potential administrative independence from government ensures that it cannot be construed as a tax and implies that it likely does not require the legislative authorization that may be needed for a revenue-raising auction (Pesko, 2016).

Economists typically favor the use of auctions for the initial distribution of emissions allowances for a number of reasons, including the ability to raise revenue (Cramton and Kerr, 2002). A consignment auction does not raise revenue, but like other auctions it inoculates a trading program against many efficiency and fairness issues that could be associated with free allocation. In addition, there are long-term benefits to reducing even short-term inefficiencies, such as improved long-term capital decisions, lower allowance prices, and improved market competition, which make future programs and policies more politically feasible. For programs that plan to phase in a revenue-raising auction, a consignment auction provides a way to introduce the methodology. Trading programs using free allocation in lieu of revenue-raising auctions may therefore benefit from adding a role for consignment auctions for all or some of allowances that are distributed for free.

In brief, consignment auctions appear to offer a nearly zero-cost way to improve the operation of an emissions market and the decision-making process of regulators and firms. Hence, they may play an important role whenever free initial distribution of emissions allowances is feature of an emissions market. In this paper, we describe how consignment auctions have improved the functioning of past SO<sub>2</sub> and

CO<sub>2</sub> markets by supporting price discovery and market liquidity and allowing minimum prices to be used in markets. Next, we describe general concerns about the efficiency and perceived fairness of markets where emissions allowances are initially distributed for free. We explain the potential role of consignment auctions in overcoming these concerns through increased transparency and reduced uncertainty in the identification of a market price. We then review specific obstacles to efficient decision-making at the regulatory and organizational levels. Even the suspicion of these obstacles affects the choices of policy-makers, and the attributes of consignment auctions would help mollify these concerns.

## 2. Price discovery and market liquidity

Two central components of an efficient allowance market are the early discovery of an allowance price close to the long-term equilibrium price path and early, as well as sustained, market liquidity. These components are essential to ensuring efficient long-term investment planning and the use of allowances for their highest-valued purpose in the market (Hahn and Noll, 1982).

In a system involving free allocation of emissions allowances, a portion of freely allocated allowances may be used directly for compliance and therefore may never enter the market. If this occurs on a large scale, the lack of visible and plentiful transactions may hamper the discovery of the marginal cost of abatement and the market price of an emissions allowance (Stavins, 1995; Hahn and Stavins, 2011). Firms wishing to engage in the market are presented with the burden of both identifying the opportunity cost of abatement options and finding market opportunities in an area that is not their core business. Successive bilateral trades in a thin (illiquid) market may lead to wide variance in prices that reinforces firms' reluctance to engage in transactions. These factors may further decrease the frequency of trades and result in lower market participation (Hahn and Noll, 1982). Fewer trading partners may be detrimental to the development of a liquid market in which money can be easily converted to allowances and allowances to money (Holt et al., 2007). The illiquidity of the market may be further exacerbated through the banking of allowances, which enables firms to retain and use their freely allocated allowances for years rather than engaging in the market.

Several of the limitations of trading programs that rely on free allocation were observed in the early years of the SO<sub>2</sub> cap-and-trade program, which was created under the 1990 amendments to the US Clean Air Act and took effect in 1995. In the program, free initial distribution of allowances was coupled with increasing stringency for compliance over time, with the intent to encourage early emissions reductions and banking of allowances. The incentive to bank early emissions allowances was supplemented by an allocation of bonus allowances to firms for preferred compliance choices (primarily flue gas desulfurization, or scrubbers). The result was that some firms could plan for compliance, go it alone, and not engage in trading (Burtraw, 1996; Ellerman, 2000). The thin market that existed in the early years of the program posed a concern for other firms that needed to purchase allowances or to demonstrate guaranteed access to allowances in order to acquire project financing (Hausker, 1992), and it appears that it also increased the overall cost of the program, as measured by the difference between the marginal cost of abatement among firms during the first few years of compliance (Carlson et al., 2000; Ellerman et al., 2000).

The SO<sub>2</sub> program, which relied entirely on free allocation to distribute allowances to incumbent firms, also required that 2.8% of the allowances issued every year be submitted for sale to a revenue-neutral consignment auction. Private allowance holders also could consign allowances for sale in the auction. The proceeds from the auction were returned to industry or other sellers in proportion to their original ownership. For a decade, the auction was run independently of the government at zero cost by the Chicago Board of Trade. EPA took over the operation of the auction in 2006 and also found the

<sup>3</sup> California provides information on allowance consignment requirements and auction participation in its Guidance for Allowance Consignment to Auction. (Accessed 26 May 2016.) [https://www.arb.ca.gov/cc/capandtrade/auction/consignment\\_guidance.pdf](https://www.arb.ca.gov/cc/capandtrade/auction/consignment_guidance.pdf)

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