

Introducing Consignment Auctions of Emission Allowances to China's National ETS

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Abstract

China, as one of the most important players in the context of decarbonization, kickstarted its national emission trading schemes (ETS) in 2021, which is a market-based mechanism that puts a price on emission activities so as to incentivize companies to implement new technologies that reduce greenhouse gas emissions in a cost-effective manner. However, there are many issues remain unsettled in China's National ETS. One of the issues is how to generate a clear carbon price signal in the ETS. This paper argues that the price signal can be improved by implementing an auction mechanism in the distribution of the emission allowance. By analyzing California's ETS and the challenges that China faces when implementing the standard auction to its ETS, this paper proposes to introduce the consignment auction mechanism as a transition method toward a standard auction so as to improve the carbon price signal in a relatively short term.

Keywords: ETS, emission allowances, consignment auction

1. Introduction

Improving the carbon price signal in emission trading schemes has long been essential in developing the ETS in China. One of the most recommended ways to improve the price signal is introducing auctioning in the initial distribution of the allowance. (Xue et al., 2022)

Free allocation of allowances, such as grandfathering, has been criticized for some reasons. On the one hand, it is concerned that carbon-intensive industries that received free allowances from the government might enable them to generate the so-called *windfall profit*. (Ellerman, Marcantonini & Zaklan, 2016) Since the allocated allowance to each firm is determined by their historic emission level, firms usually do not have much financial cost to comply with ETS. Thus, they might not have enough incentive to reduce emissions and implement renewable technologies. On the other hand, free allocation does not have the price-discovery function, leaving the secondary market the only place carbon prices can form. However, those allowances allocated for free might be stored for compliance and never be able to enter the market. (Hahn & Stavins, 2011) The larger the proportion of these never-traded allowances, the less the proportion in circulation will be. Therefore, the carbon price and the marginal cost of abatement will not form correctly with a small number of transactions. (Hahn & Stavins, 2011)

Many jurisdictions moved away from free allocation to auctioning to address the issue. However, the transition had been slow and challenging due to significant resistance from industries. For example, it took the EU about 15 years to slowly increase the auction rate from 5% to over 50%. (European Commission, 2021) Since the ETS in China is still in a relatively early stage, and there is no clear roadmap toward auctioning. Free allocation seems to remain dominant for years to come.

In this paper, I propose introducing a consignment auction mechanism to ETS in China as a transition method toward a standard auction. The key feature of a consignment auction is that it is a combination of free allocation and auction. Under the consignment auction scheme, firms first receive free allowances from the government,

after which firms are required to consign all of the allowances for auction. Then, through auction, the firms will purchase the number of allowances according to their demand at the auction clearing price. The revenues generated in the auction will be returned to firms and can only be spent for a specific use, such as implementing renewable technologies, repaying household users, etc. (Burtraw & McCormack, 2017) Because firms will not spend money during the allocation, a consignment will receive less resistance than a standard auction. By putting all of the allowances into the primary market, a consignment auction provides a venue for carbon price discovery as early and thoroughly as possible, improving the transparency of the market at the same time. (Burtraw & McCormack, 2017)

In short, a consignment auction provides a revenue-neutral auction mechanism. It overcomes the difficulties of lacking a price discovery function in a free allocation and posing a high financial burden on firms in a standard auction, which China is currently facing. This paper contributes to the scholarly discussion by answering the research question: Is it viable to introduce a consignment auction to China's National ETS to improve the carbon price signal in the market?

The structure of this paper will be as follow: Section 2 will introduce the consignment auction in practice in California and the linkage between the price signal and the consignment auction; Section 3 will discuss the advantages and disadvantages of the consignment auction by comparing free allocation and standard auction with consignment auction respectively and demonstrate the reason why the consignment auction could be the solution to the difficulty that China is currently facing; Section 4 will provide some recommendations for implementing consignment auction in China; Section 5 concludes.

2. Consignment Auction in California

Consignment auction was first used in the SO₂ cap-and-trade program to address the limitation in the early stages of the market. (Burtraw & McCormack, 2017) For example, the small trading volume in the secondary market poses difficulties for firms that need to purchase allowances for compliance. (Hausker, 1992) During the designing stages of California's CO₂ cap-and-trade program, policymakers recognized the benefits of consignment auctions. They incorporated it into the system to serve the purpose of improving the liquidity of the market and directing allowance value to specific uses. (Burtraw & McCormack, 2017) In terms of coverage, consignment auction only covers Investor-Owned Electric Utilities (IOUs) and Publicly Owned Electric Utilities (POUs). (Khezzr & MacKenzie, 2018)

During the whole process of consignment auction in California, there are two critical procedures, namely the determination of the clearing price in the auction and the firms' obligation to use the revenue for specific uses, both of which reflect how the consignment auction fulfills its objective.

2.1 The Price Signal and Consignment Auction

Regarding the clearing price, it is determined by the auctioneer after firms consign the allowances for auction. Along with the allowances, firms are also required to submit a demand curve to the auctioneer based on different price levels. Then, the auctioneer calculates a market demand curve by adding every firm's curve altogether. The clearing price is determined by the intersection of the market demand curve and the allowance cap. (Hahn & Noll, 1983) Therefore, net payment to the government is zero at the market level. (Hahn & Noll, 1983) At the individual level, every firm's allowances are determined by its demand at the clearing price. During the auction, each firm will spend an amount of money equal to the clearing price times its own demand at that price and receive back an amount of money equal to the clearing price times the number of allowances allocated freely in the first stage. (Hahn & Noll, 1983) By forcing all the allowances to be consigned for auction, the auctioneer is able to gather all the information of demand for allowances and calculate a respective clearing price that reflects every company demand in the market. Thus, forming a clear price signal and increasing the liquidity in the carbon market.

However, some scholars comment that, for each firm, its demand for allowances at the clearing price might not necessarily be equal to the allowances it received in the first stage, which means the consignment auction might not be revenue-neutral at the individual level. For example, a firm that receives more consignment revenue than it originally planned to spend on purchasing allowances will become a 'net seller'. (Dormady & Healy, 2019) Contrarily, firms that receive less than they planned to spend will become 'net buyers.' (Dormady & Healy, 2019) However, this paper argues that 'net sellers' and 'net buyers' will not exist because every company tends to purchase the exact same number of allowances they receive. (Khezzr & MacKenzie, 2018) This issue will be further discussed in the next section.

2.2 The Use of Auction Revenues

In terms of directing the auction revenue, California's regulation requires companies to allocate most of the revenue to repay the household users to protect them from being exposed to the increasing electricity prices because of the carbon market. To monitor the flow of revenue, the government has also set up an electric system

called “The Compliance Instrument Tracking System Service” (CITSS) to make sure compliance. According to the statistics provided on the official website of California’s cap-and-trade program, about 86% of the revenue generated from IOUs had been allocated to household users from 2013 to 2020, while 21% of the revenue generated from POUs had been allocated to improve energy efficiency and invest in renewable energy. (California Air Resources Board, 2022) These statistics show that the ultimate purpose of the revenue is to avoid raising the electricity prices for household users, which makes the carbon market more politically acceptable and viable. The second objective of these revenues is to make investments in decarbonizing the energy industry and thus help put forward the transition to a green economy.

3. The Pros and Cons of Consignment Auction and the Reason Why It Fits China

Since its implementation in the SO₂ and CO₂ cap-and-trade programs, consignment auction has been playing a significant role, and many scholars have recognized its contribution. Through comparison with free allocation and the standard auction, this section summarizes the uniqueness and limitations of consignment auction and demonstrates how it could be helpful for China’s National ETS.

3.1 Consignment Auction’s Advantages over Free Allocation

Compared to free allocation, a consignment auction has the same characteristic as the standard auction, which is capable of overcoming some major challenges that the free allocation method faces.

Firstly, a consignment auction has a price discovery function that free allocation does not have. As discussed in the last section, one of the essential procedures in the consignment auction is the determination of the clearing price, which is able to form the price signal in the primary market. However, with a free allocation method, the important task of price discovery is left only to the secondary market. Moreover, in the early stages of ETS, the trade volume in the secondary market might not be massive enough to form a clear price signal, and thus the marginal abatement costs remain unclear. (Zheng, 2016) Even if in a more mature stage of ETS, the price signal formed in the secondary market might not be accurate because a large proportion of the free allowances that are stored by companies for compliance will not enter the market at all. So, it will be difficult for companies to make a reasonable compliance decision, which dramatically hinders the ETS’s cost-effectiveness.

Secondly, the consignment auction can improve companies’ motivation to reduce emissions. Under the free allocation method, companies will receive allowances based on their historic or benchmark emission level, which can cover most of their emission. Therefore, companies might not try their best to reduce emission levels in order to receive more allowances in the future. (Zheng, 2016) Moreover, since the allowances are given to firms for free, they might not have a clear understanding of their value and might oversell them on the market to make a profit or overstore them for compliance. However, under the consignment auction, companies have to purchase the allowance in the primary market. Even though the cost will be repaid to companies, they are only allowed to spend it for specific uses, such as reducing emissions. Thus, companies will be forced to cut their emissions. Moreover, with the process of auctioning, companies would have a clearer perception of the value of allowances so that they are more likely to recognize the importance of reducing emissions.

Thirdly, a consignment auction can improve transparency in the distribution of allowances. The free allocation method is often under criticism for lack of transparency. (Binmore & Klemperer, 2002) However, by introducing the consignment auction, the scheme reduces the government’s intervention during the process, makes the distribution process of the allowance visible, and thus, improves the fairness of the allocation. (Burtraw & McCormack, 2017) Moreover, the auction helps the government evaluate the status of the market by generating sufficient information regarding the pricing and number of allowances sold. (Burtraw & McCormack, 2017)

3.2 Consignment Auction’s Advantages over the Standard Auction

Compared to a standard auction, a consignment auction has some characteristics similar to the free allocation, making it less likely to receive as much resistance as the standard auction.

Firstly, the most noticeable characteristic is that consignment auction returns the revenues to companies, which means that companies do not need to spend money in the process. Moreover, since it does not significantly increase the cost of compliance, it will not render regulated companies less competitive compared to other companies that are not covered by ETS or ETS without an auction scheme. (Zheng, 2016) Therefore, unlike the standard auction, it will not impose heavy financial burdens on companies, which makes it more acceptable than the standard auction.

Secondly, the consignment auction overcomes the criticism that the standard auction might result in a monopoly in the primary market by big companies. (Zheng, 2016) This is because companies with substantial financial power can purchase as many allowances as they want in the standard auction, which poses enormous difficulties for those small companies to purchase allowances in the auction. Thus, small companies might be more and more reluctant to participate in the auction, leading to big companies monopolizing the primary market.

However, under the consignment auction, every company is required to submit a demand curve for allowance and participate in the auction, which reduces the possibility of monopoly by large companies.

3.3 The Disadvantages of the Consignment Auction

However, consignment auction has its own disadvantages compared to free allocation. To be specific, the design of the consignment auction might be a bit counterintuitive. (Burtraw & McCormack, 2017) Unlike the other two traditional allocation methods, it combines free allocation with the standard auction, making the allocation process slightly more complicated. Therefore, it requires the regulator to publish comprehensive and detailed guidelines for the government and companies, which might be more time and effort-consuming to set up the scheme. Also, the consignment auction requires more supplementary systems to support the scheme. For example, a system to monitor revenues' use is necessary to ensure compliance, which does not exist in free allocation or the standard auction.

Another disadvantage is that the price signal it delivers might not truly reflect the demand of the companies. (Khezzr & MacKenzie, 2018) This is because every company tends to obtain the same number of allowances as they first received for free. (Khezzr & MacKenzie, 2018) The reason is that if companies want to make a profit through the auction, they have to ensure the number of allowances they purchase is less than the number they initially received. Thus, it is possible that they might not be able to obtain enough allowances for compliance in the auction, forcing them to purchase allowances in the secondary market, in which the price is riskier and more difficult to predict. Therefore, the best bidding strategy for every company is to obtain the same number of allowances as they are initially received, which means that 'net sellers' and 'net buyers' are not likely to exist. (Khezzr & MacKenzie, 2018)

It is undoubtedly one of the major limitations that consignment auction faces since it resembles the free allocation with a few more steps instead of the standard auction. This is exactly why it can only be suitable to play a transition role towards a standard auction rather than replacing it.

3.4 The Reason Why It Fits China

After analyzing the characteristics of the consignment auction, this paper argues that it can play a crucial role in facilitating the transition from free allocation to the standard auction in China's Nation ETS because it can help address some major difficulties in China's ETS.

Firstly, the main method in the allocation phase of China's National ETS is free allocation. Although there is a provision in the Draft Interim Regulations requiring the implementation of a standard auction scheme at the right time, there is no clear roadmap toward auctions being announced. (Ministry of Ecology and Environment of China, 2021)

Secondly, there are important political and economic considerations underlying the design of the National ETS. (Busch et al., 2018) Policymakers have to balance these interests to avoid a severe negative impact on economic development coming from the National ETS. (Busch et al., 2018) From a political point of view, the National ETS has to make sure of the acceptability and viability of the scheme, which means that it cannot be too aggressive in terms of increasing the companies' production costs. From an economic point of view, the top priority for China remains economic development. Therefore, even though implementing an ETS is necessary, it might still not align with the overall development in China to some extent, which limits the overall stringency of the ETS. An example can be found in the cap design of the ETS, which is an economic intensity cap instead of an absolute cap. (Pizer & Zhang, 2018)

Based on these considerations, the resistance to implementing an auction scheme becomes easy to understand. Because it will impose huge financial burdens on the regulated entities, driving up their production cost and thus rendering them less competitive. In short, this will adversely affect the local economy. (Wang et al., 2022) Therefore, both companies and local governments are reluctant to put forward an auction scheme. (Wang et al., 2022)

Under this context, the consignment auction can perfectly facilitate China to achieve these policy goals. On the one hand, unlike the standard auction, the consignment auction does not impose any financial burdens on regulated entities, thus being capable of balancing the economic development and the purpose of ETS. The companies' only obligation is to spend the returned auction revenue on specific uses according to the requirement from the regulator, which might not necessarily render the companies less competitive. For example, one possible requirement might be that companies have to spend the revenue on promoting energy production sufficiency and renewable technology, which increases their competitiveness. Therefore, the consignment auction will probably receive much less resistance from the regulated companies and local governments.

On the other hand, the consignment auction can solve the major challenge that National ETS faces: insufficiency of the carbon price signal. This is due to the small trading volume in the ETS. (Sun, Zhang & Men, 2022)

According to the statistics published by the Shanghai Environment Energy Exchange, about 81.6% of the trading occurs within two months before the compliance date. (Sun, Zhang & Men, 2022) With such an inactive market, it is almost impossible to form a proper price signal, thus hindering the efficiency of the ETS. With a consignment auction, all allowances are forced to enter the market so that a relatively accurate price signal can form in the auction to supplement the price signal in the secondary market.

4. Recommendations for China

The administrative cost for the consignment auction is relatively low since most of the processes are conducted through the auctioneer and companies. (Wang & Fang, 2020) Therefore, the recommendation for regulators mainly focuses on two aspects: building up the framework of the consignment auction and setting up a monitoring system.

4.1 Building up the Framework of the Consignment Auction

Though the administrative cost is minimal compared to free allocation or the standard auction, the design of the consignment auction is slightly more complex. First of all, regulators can draw on the experience of California's cap-and-trade program and design a transition roadmap that specifies the gradual implementation of the consignment auction and the standard auction. Moreover, it is important for regulators to set down the procedures of the consignment auction to provide clear guidelines for companies and auctioneers so that they can fully understand how the system works and what they should do to comply.

4.2 Setting up a Monitoring System

Another critical aspect of the consignment auction is the tracking of the auction revenues because it relies on companies to allocate the revenues to specific uses on their own. Firstly, a reporting obligation should be established to monitor the revenues' use, including which company has been invested, what investment has been made, etc. Furthermore, a financial monitoring system is needed to verify the authenticity of these reports. In the end, clear legal consequences for non-compliance should be established to ensure the proper functioning of the scheme.

5. Conclusions

By analyzing the consignment auction mechanism in California's cap-and-trade program, this paper has discussed how it works and compared it with two other major allocation methods. Moreover, this paper found that the uniqueness of the consignment auction makes it a perfect allocation method for the early-staged ETS that lacks sufficient venues to form a clear and proper price signal, which is the case in China's National ETS. Since the consignment auction can achieve multiple policy objectives, it provides an enlightening solution for China's National ETS to improve the price signal in the market without using the standard auction that will impose too heavy financial burdens on companies at the early stage of the program. Therefore, it could be a good fit for China's National ETS.

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