Lessons Learned from China's Regional Carbon Market Pilots

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Executive summary

Under the dual incentives of climate mitigation and co-benefits, China has launched seven regional carbon market pilots since 2013. It is a giant step for the world's largest greenhouse gas (GHG) emitter to test market-based instruments in climate mitigation. The pilots cover all four province-level municipalities (Beijing, Shanghai, Tianjin, and Chongqing), two provinces (Guangdong and Hubei), and one special economic zone (Shenzhen). These pilot regions are important provincial/city units in terms of their economic and political clout. Since the creation of seven regional ETS pilots, China has become the world's second largest carbon market. the experience of and lessons from these pilots will facilitate other subnational units to join in the upcoming national emission trading scheme (ETS).

This paper gives an overview on the mechanisms and outcomes of China's regional carbon market pilots. In particular, we introduce the design of key market elements including selection of pilot regions, emission allowance, covered sectors, allowance allocation, monitoring, reporting and verification (MRV), compliance and penalties, and offset market. These market characteristics are linked to market performance in the later analysis.

This paper also evaluates the performance of the seven pilots using publicly available data from the secondary carbon markets that trade emission allowances and related financial instruments. We find that the carbon prices of most markets rose during the early stage of the trading and then declined gradually. Most transactions occur in the period that leads up to the compliance deadline. Based on the trading data, we also construct an indicator similar to the turnover rate in the stock market to compare the transaction activeness of the seven pilots.

We find that the regional pilots have generated moderate emission trading activities so far. Therefore, their impacts on carbon emission reduction and cost saving might be very limited. However, the primary goal of the regional ETS pilots is to test whether China can use market mechanism to regulate carbon emissions, and to prepare for the national ETS. In this context, the regional pilots are successful in reinforcing China's capacity in developing the national and provincial institutions for climate change.

In terms of much hoped co-benefits, the ETS pilots might have limited effects on improving air quality. Because the national air pollution regulation is more binding than the climate policy, this reduces the usefulness of ETS in air pollution control. On the contrary, tough air pollution control policies require firms to reduce energy consumption. The command-and-control policy reduces the demand for carbon credits and then suppresses carbon price.

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The lessons learned from the regional carbon market pilots provide insights for the design of the national carbon market. Specifically, we make the following recommendations in terms of climate legislation, market segmentation, MRV system, and data transparency for the national ETS.

First, climate legislation is the cornerstone of a healthy national ETS. The fundamental flaw of the regional pilots is a lack of top design. Without a national climate legislation, provinces have discretion to set the stringency of carbon regulation. Therefore, a national law on climate change, preceding the government order on the establishment of national ETS, is needed to ensure the sustainability and stability of the national carbon market. Without a legally binding commitment, local governments are less likely to take climate change seriously.

Second, the current segmented regional carbon markets reduce market efficiency and liquidity, which entails the need for a unified market design. However, market linkage is not suggested for the regional pilots without imposing the same MRV protocols and enforcement across all markets. To avoid carbon leakage, the regional pilots and the national ETS should be run independently until all firms are covered by the national ETS.

The national ETS needs to take into account different regional development levels. China is a country with significant regional heterogeneity. Some regions are still in the rapid process of industrialization and urbanization; the firms in these regions might be dirtier and more vulnerable to GHG regulation. Although the national ETS rules should be the same across regions, the regional equity issue can be addressed by differentiated allowance allocation.

Third, three key elements of the regional pilots—allowance allocation, compliance, and MRV system—have deficiencies and need to be improved. Specifically, allowance auction is a good price discovery mechanism and should be adopted by the national ETS. Perfect compliance is not desirable if it is achieved by manipulating the deadline. The cost of verification should be fixed and paid by the government.

Fourth, very limited data and information for the regional ETS pilots are publicly accessible, which not only makes the empirical analysis very challenging but also causes the concern whether the allocation of allowances is fair. Therefore, transparency should be enhanced under the national ETS. In order to ensure the equity, complete and explicit criteria should be published with respect to the allowance allocation. Additionally, company's interests in data privacy should also be taken into account and anonymized data can be released primarily.