

China's National Carbon Dioxide Emission Trading System: An Introduction

Lawrence H. Goulder¹, Richard D. Morgenstern², Clayton Munnings,³ and Jeremy Schreifels⁴

Executive summary

This paper serves as an introduction to *China's National Carbon Dioxide Emissions Trading System: Innovations, Issues and Challenges*, a special issue of *Economics of Energy & Environmental Policy*. The special issue derives from a two-day workshop held in Palo Alto, California in January 2017, a gathering co-sponsored by the Stanford Environmental and Energy Policy Analysis Center and Resources for the Future and involving leading scholars from China, the U.S., and elsewhere. The present paper brings out key issues explored in the special issue's papers as well as other issues important to China's efforts to reduce carbon dioxide (CO₂) emissions through a nationwide emissions trading system (ETS).

This article first offers background on developments leading to the formation of the national ETS. In the 11th Five-year Plan (FYP) (2006-2010), China's national government adopted a number of increasingly ambitious energy and air quality targets to address domestic environmental and energy challenges. Building on earlier laws and national guidelines, in 2011 the National Development and Reform Commission (NDRC) announced plans to implement two provincial and five municipal pilot ETS programs to reduce CO₂ emissions. The record of the seven pilot programs, initiated in 2013, has been mixed. Nonetheless, in 2015 a joint China-US presidential statement announced that China would begin implementation of a national carbon ETS in 2017.

The article then describes the design of the national program. China's sheer size, industrial and geographic heterogeneity, income disparities, and diverse institutional characteristics introduce challenges to the design and success of the program. The significant presence of state-owned entities in the Chinese economy poses additional challenges. Prices in these enterprises are administered rather than market-determined, and some of the enterprises wield significant monopoly power. These features can reduce the efficiency of the ETS by limiting the extent to which the costs of emissions abatement are reflected in the prices of goods and services.

Once fully implemented, the national program will become the world's largest ETS, increasing by over 50 percent the global coverage of CO₂ under such programs. Initially covering the power, cement, and aluminum sectors, it will eventually expand to other sectors and embrace

1 Corresponding author. Department of Economics, Stanford University, CA 94305, USA. goulder@stanford.edu

2 Senior Fellow, Resources for the Future (RFF), Washington, D.C., USA.

3 Senior Research Associate, Resources for the Future (RFF), Washington, D.C., USA.

4 Visiting Fellow, Resources for the Future (RFF), Washington, D.C., USA.

approximately 7000 companies. The nationwide ETS will take the form of a tradable performance standard, meaning that the allocation of allowances to firms in each sector will be based on a target ratio of emissions to output that is considered a good target for firms in that sector. In contrast with other tradable performance standard systems, the allocation of allowances will involve a two-step process, with firms receiving an initial and conservative allocation at the beginning of each compliance period and a further allocation of allowances at the end of the period that accounts for firms' actual output over the whole period.

The next two sections of this article summarize the five papers developed by other authors and bring out key themes from these papers. One recurring theme is that the wide variation in incomes and structures of the local economies across different sectors and provinces makes the creation of an effective and equitable ETS exceptionally difficult. In formulating the allocation rules that apply nationwide, program designers have attempted to accommodate different circumstances among the provinces, for example by reserving some free allowances for allocation to particular regions. Another key theme is the difficulty of obtaining reliable data on emissions. China aims to confront this difficulty by enlisting third-party verifiers to review all covered companies' emissions reports, but it is unclear whether there will be a sufficient number of such verifiers to review all covered companies' emissions reports within the relatively short reporting window and at a reasonable cost. A third theme is that, in the pilot programs, the penalties for non-compliance were weak and that, to provide significant incentives for compliance, stronger penalties will be needed in the national program.

The final section brings out additional issues of great relevance to the success of the national ETS. These include concerns about the potential for "unacceptably low" CO₂ allowance prices in the ETS; the potential use of an allowance auction to enforce a floor on CO₂ allowance prices; the need for a transparent review process to assess the success of the program and, if necessary, identify modifications to improve the program; and the benefits from limiting government intervention in the emissions trading market.