



China has the capacity to lead in carbon trading

Pilot schemes launched this year could be the start of a world-class system — if the country can solve its data-gathering problems, says Qiang Wang.

The value of the world's carbon market fell for the first time last year. More than one-third was wiped from the price of carbon credits in a plunge that reflects the continued global economic crisis and uncertainty over the future of emissions-trading schemes.

Is it a good time to buy carbon credits? Perhaps not yet, but some shoots of recovery are visible, not least in my own country of China. Largely unnoticed in the West, Chinese carbon trading is getting up and running. In just two years, officials have designed and started to implement seven trading trials that cover around one-third of China's gross domestic product and one-fifth of its energy use. If successful, the schemes will show that emissions trading could be a powerful way for China to control its greenhouse-gas emissions.

The first trades in one of these schemes took place in September 2012, when four cement-manufacturing companies in the southern, industrial region of Guangdong province invested several million dollars each in carbon-pollution permits, which they will need to expand operations. The Guangdong scheme is expected to cover more than 800 companies that each emit more than 20,000 tonnes of carbon dioxide a year across nine industries, including the energy-intensive steel and power sectors. These firms account for more than 40% of the power used in the province. The Guangdong carbon market alone will regulate some 277 million tonnes of CO₂ emissions by 2015, almost equal to Ukraine's total annual CO₂ emissions.

China plans to open six further regional emissions-trading schemes this year, in the province of Hubei and in the municipalities of Beijing, Tianjin, Shanghai, Chongqing and Shenzhen. It plans to expand and link them until they form a nationwide scheme by the end of the decade; that would then link to international markets.

China is not alone. Australia and South Korea are scheduled to open their own carbon markets in 2015, and California launched its first carbon-allowances auction in November 2012.

China may not seem a natural home for carbon trading. With heavy government intervention, significant state ownership of enterprises and a culture of distrust in business, the country remains far from a true market economy. Until now, China's experience of carbon trading has been almost exclusively under the Clean Development Mechanism, the international carbon-trading scheme set up under the Kyoto Protocol, to which it is the leading supplier of credits. Only a few symbolic transactions of carbon offsets have been made since the Beijing, Tianjin and Shanghai voluntary emissions-trading exchanges opened in 2008.

However, China's political system could let a carbon market grow faster than anywhere

else. Once Chinese leaders have accepted a concept, opposition is steamrollered and changes are implemented much more quickly and broadly than is possible in societies in which policy-making is based on a balance of the interests from different stakeholders. Stable policies are crucial to the success of emissions trading, which — unlike most markets — grows from the top down.

Challenges lie ahead for emissions trading in China. The country needs to develop and enforce proper legislation and regulations to measure, report and verify carbon emissions from industrial sites. It needs to build an effective and accountable framework to oversee the reporting and trading of carbon credits. Most urgently, China needs to look at how it collects and analyses data on carbon emissions.

The credibility of China's statistics on energy use and carbon emissions has long been questioned, partly because numbers calculated using top-down and bottom-up statistics do not match. The discrepancies can be very large. For example, last year, scientists compared Chinese CO₂ emissions as calculated using top-down energy data from the National Bureau of Statistics of China with those calculated using bottom-up data from the 30 provincial statistics bureaus. For 2010, the bottom-up figure was larger by an amount equivalent to the total annual CO₂ emissions of Japan, about 5% of the global total (D. Guan *et al. Nature Clim. Change* 2, 672–675; 2012). Without accurate numbers, the first deal of the Guangdong trading scheme was based on expected future carbon emissions, rather than historical data.

China should set up a reliable system for gathering carbon data as soon as possible, and build a comprehensive database of carbon emissions. Standard international methods for carbon trading to reduce emissions demonstrate how to set up a baseline, show that any emissions change is genuine and calculate the reductions.

Reliable data-gathering will require effort from the scientific community at home and abroad, to improve statistical methodology. It will also need political action. The organizations that collate and publish carbon statistics should be made independent of possible government interference. And China needs specific laws to ensure honest reporting and transparency, and to punish those who make fraudulent or misleading claims about their carbon emissions.

If China can build a workable and credible emissions-trading scheme, it will benefit not just one country, but the entire world. ■

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