China's Pilot Carbon Trading Markets

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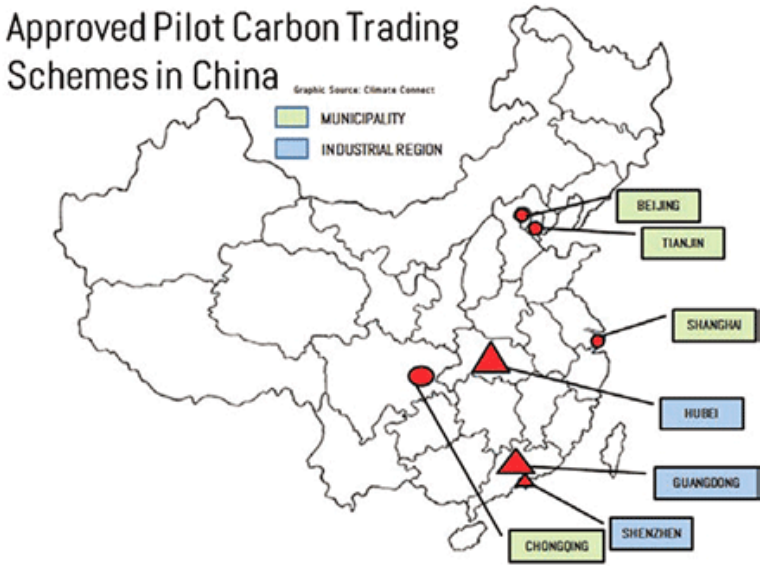
China's rapid economic growth after the reform and opening-up policy in the late 1970s resulted in a significant increase in emissions of greenhouse gases, especially carbon dioxide. By 2007, China had surpassed the United States and became the largest energy-related carbon dioxide emitter in the world.[1] The necessity for confronting the threat brought about by global warming and pressure from the international community have led to concrete efforts by the Chinese government to reduce carbon emissions.

In the Twelfth Five-year Plan, the Chinese State Council made it clear that China would establish a carbon trading market with the purpose of reducing greenhouse gas emissions in a more cost-efficient way. Beginning in 2013, seven pilot carbon trading markets (two provincial markets – Guangdong and Hubei; five municipal markets – Beijing, Shanghai, Tianjin, Chongqing, and Shenzhen) started operations in order to meet China's commitment stated in the Twelfth Five-year Plan. The location of these seven pilot markets is shown in Figure 1.

Figure 1. Location of the Seven Pilot Markets



Source: Stockholm Environment Institute (SEI)[2]

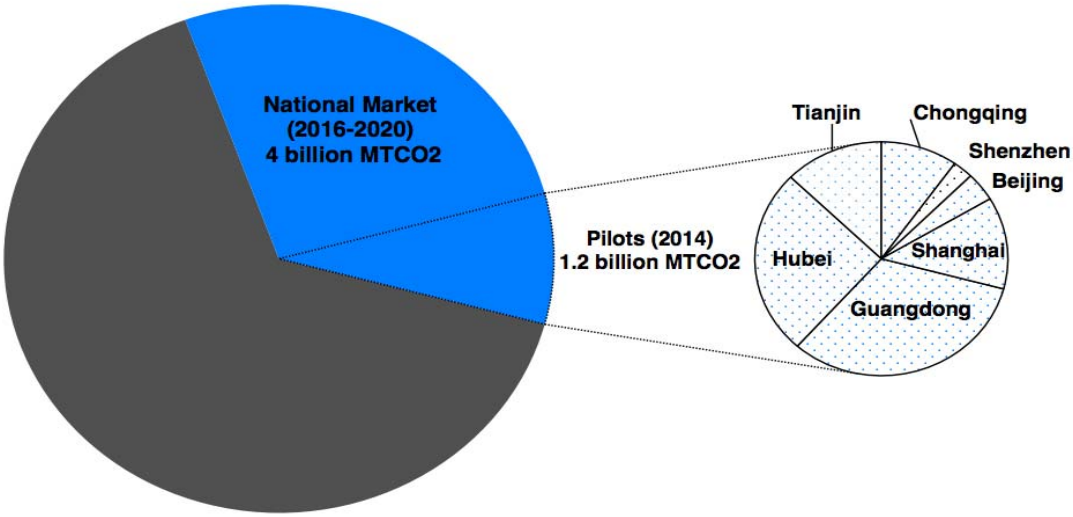
These five cities and two provinces covered a large geographical range from north to

[1] Emission Database for Global Atmospheric Research (EDGAR), European Commission, http://edgar.jrc.ec.europa.eu/overview.php?v=CO2ts_pc1990-2013

[2] http://www.sei-international.org/mediamanager/documents/Publications/china-cluster/SEI-PB-2012-China-carbon-markets.pdf

southwest China, with a GDP of 10.9 trillion RMB (i.e., 27% of the national total GDP), and 760 million tonnes standard coal of energy consumption (23% of the national total). Although there are only seven pilot markets, they address approximately 2,247 enterprises[3] in over 20 industries, emitting some 1.2 billion tonnes of CO_2 emissions under the program.[4]

Figure 2. China's carbon market emissions



Source: Carbon Eight Group, 2014.[5]

According to the National Development and Reform Commission (NDRC) of China, the prospective amount of carbon emissions of the national market is approximately 3-4 billion tonnes.[6] As can be seen in Figure 2, the pilot markets cover a considerable percentage of the proposed national carbon market emissions, with Guangdong and Hubei the largest pilots relative to the national market. Hubei and Shenzhen had the largest trading volumes over the April 2014-April 2015 period, however, while Chongqing and Tianjin had the smallest, as shown in Figure 3.

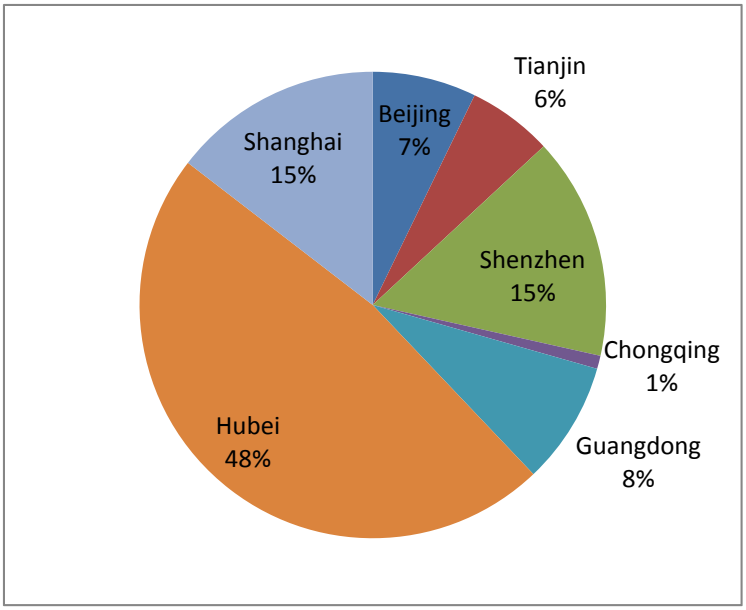
[3] Ning, Jinbiao [宁金彪]. Zhongguo Tanshichang Baogao (2014) (中国碳市场报告 2014) [Annual Report on China's Carbon Market (2014)]. Beijing: Social Sciences Academic Press, 2014, p001

[4] Zheng, Shuang [郑爽]. *Quanguo Qi Shengshi Tanjiaoyi Shidian Diaocha yu Yanjiu* (全国七省市碳交易试点调查与研究) [Investigations and Research of the Seven Pilot Carbon Trading Markets in China]. Beijing: China Economic Publishing House, 2014, p2

[5] Carbon Eight Group, October 8, 2014. Charting China's Carbon Horizon; http://carboneightgroup.com/uploads/3/4/2/0/3420632/carboneightgroup_chinacarbondownload_8.8.14.pdf.

[6] Xinhua News. http://news.xinhuanet.com/energy/2015-02/09/c_127473251.htm

Figure 3. Relative trading volumes in the pilot markets (April 2014 to April 2015)



Source: Based upon data from politics.people.com.cn[7]

The following sections introduce and discuss the total emissions cap and industries covered within the pilots; the allocation policy for emission allowances; allowance price and trading volumes in the seven pilot trading markets; laws and regulations affecting the pilot markets; and monitoring, reporting and verification (MRV) policies affecting individual sources and the markets as a whole.

Total emissions cap and industries covered

Each pilot market sets its own cap for total carbon emissions within the region, taking factors such as resource endowment, its energy consumption target, its energy intensity target, GDP growth and other local circumstances into consideration. Vast differences exist between the caps of the seven pilot markets – from 30 million tonnes CO_2 emission in Shenzhen (the lowest) to 350 million tonnes CO_2 emission in Guangdong (the highest), accounting for from 33% to 60% of total local CO_2 emissions.[8]

In terms of industries covered by the pilot markets, an expanding trend is seen in each market. Considering the factors above, the pilot markets specified the industries, enterprises and greenhouses gases covered by the markets. In the initial stages, energy-intensive industries such as electricity and thermal power generation, chemical

[7] Politics. http://politics.people.com.cn/n/2015/0410/c1001-26823929.html

[8] Ibid. at p.7

engineering, steel production, building material production, ferrous metal production, and oil/natural gas drilling were covered by all the pilot markets.[9] As the markets become more mature, however, it is expected that carbon emissions from service industry will similarly be included.. At present, more than 20 industries have been included, although different pilot markets have different standards about which enterprises should be controlled. Shenzhen has the most stringent policy, with all enterprises having annual CO_2 emissions over 3 thousand tonnes included.[10] In terms of the greenhouse gases being regulated, all of the pilot markets except Chongqing include only CO_2; the latter includes not only CO_2, but also five other greenhouse gases included in the Kyoto Protocol (i.e., CH_4, N_2O, HFCs, PFCs and SF_6).[11]

Allowance allocation

Most pilot markets allocate emission allowances according to the principle of "grandfathering." Companies receive allowances based upon their carbon emissions during the last three to five years. Besides grandfathering, some areas also use benchmarking as a method to allocate allowances.

Among the pilot markets, only Guangdong requires companies to purchase 3% of their allowances at a price determined by the provincial government.[12] The other six markets distribute allowances freely to enterprises, but still reserve auctions as a future option for allowance allocation. In addition, all of the pilot markets except Shanghai distribute allowances annually, while Shanghai allocates the allowances every three years.[13]

Allowance price and trading volume

Two kinds of instruments are traded within the pilot markets: allowances and Chinese Certified Emission Reductions (CCERs). Through June 2014, the total trading volume of allowances was 10.01 million tonnes, resulting in 380 million RMB of transactions.[14] By December 2015, however, the Guangdong market alone had a trading volume of 23.5 million tonnes, with 964 million RMB of transactions, -- an amount representing half of the national total.[15] However, there has been a relatively low level of

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[9] Ibid. at p.8

[10] *Temporary Guideline on the Management of Shenzhen's Carbon Emission Trading Market* [深圳市碳排放权交易管理暂行办法], People's Government of Shenzhen, March 2014, Article 11, http://www.sz.gov.cn/zfgb/2014/gb876/201404/t20140402_2335498.htm

[11] *Temporary Guideline on the Management of Chongqing's Carbon Emission Trading Market* [重庆市碳排放权交易管理暂行办法], People's Government of Chongqing, April 2014, Article 40, http://www.cq.gov.cn/publicinfo/web/views/Show!detail.action?sid=3874934

[12] *Temporary Guideline on the Management of Guangdong's Carbon Emission Trading* [广东省碳排放管理试行办法], People's Government of Guangdong, January 2014, Chapter 3, http://zwgk.gd.gov.cn/006939748/201401/t20140117_462131.html

[13] *Temporary Guideline on the Management of Shanghai's Carbon Emission Trading* [上海市碳排放管理试行办法], People's Government of Shanghai, November 2013, http://qhs.ndrc.gov.cn/qjfzjz/201312/t20131231_697049.html

[14] Zheng, Shuang [郑爽]. *Quanguo Qi Shengshi Tanjiaoyi Shidian Diaocha yu Yanjiu* (全国七省市碳交易试点调查与研究) [Investigations and Research of the Seven Pilot Carbon Trading Markets in China]. Beijing: China Economic Publishing House, 2014, p11.

[15] The Guangdong Pilot Market Accounts for Half of the Chinese Market, Tanpaifang.com, http://www.tanpaifang.com/tanjiaoyi/2015/1223/49744.html

participation by companies, and significant volatility in the trading volumes in each pilot market. For example, the trading volume of the Guangdong market was 697,000 tonnes on September 22, 2015. However, only two days later the trading volume decreased to zero.[16] A common phenomenon in the seven pilot markets is a sizable increase of allowance trading close to the compliance deadline. The immaturity of market institutions and the lack of experience by individual companies in utilizing such carbon management approaches are obvious reasons for such results.

In general, China's pilot markets encounter the same problem as the EU ETS: an excessively low allowance price resulting from an oversupply of allowances. With a lack of information about previous carbon emissions by individual companies, it is difficult for regulators to know the appropriate level of allowances to issue under "grandfathering" policies. In 2015, the highest allowance price (in the Shenzhen market) was still below 40 RMB, with the lowest price just a little above 10 RMB (in the Shanghai market).[17] Such pricing levels will not provide a sufficient incentive for companies to significantly reduce their carbon emissions.

Laws and regulations

In the absence of a national law that regulates carbon emissions trading, the five cities and two provinces have published their own municipal or provincial laws, government regulations, and/or regulatory documents, specifying the target and function of the carbon markets, as well as management and implementation policies. These regulations and documents also provide rules regarding sanctions towards non-compliance, intending to make the carbon markets operable. However, the regulations on municipal and provincial level mentioned above lack coercive elements, and are therefore unable to ensure effective compliance and operations.. Until now, only Beijing and Shenzhen have introduced binding policies authorized by the municipal People's Congress (which means these policies that are of high legal validity). The other five pilot carbon markets are governed by "softer" municipal or provincial regulations or guidelines. Furthermore, sanctions in the case of non-compliance or deliberately submitting inaccurate data (i.e., fines of 50,000 to 100,000 RMB) are not sufficiently stringent to motivate enterprises to comply with their emission limits.

Monitoring, Reporting and Verification (MRV)

MRV is the backbone of a successful carbon trading market since accurate data about carbon emissions and a stringent verification policy ensure the reliability and dependability of the trading system. A carbon trading market is only effective when it has reliable emissions data. Although the seven pilot markets in China all published individual guidelines regarding monitoring and reporting (MR) for companies, the coverage area of these guidelines varies greatly among different pilot markets. Shanghai published MR guidelines for 9 industries,[18] while Chongqing has only one

[16] Source of data: http://tanpaifang.com/

[17] Ibid.

[18] *Temporary Guideline on the Management of Shanghai's Carbon Emission Trading* [上海市碳排放管理试行办法], People's Government of Shanghai, November 2013, http://qhs.ndrc.gov.cn/qjfzjz/201312/t20131231_697049.html

general guideline for all industries.

At the national level, the National Development and Reform Commission (NDRC) published a document in November 2015 entitled *Temporary Guideline on Carbon Emission Trading Management*, with vague wording on specific rules for MRV. On November 19, 2015, the country took a step further by publishing the *General Guideline of the Greenhouse Gas Emissions Accounting and Reporting for Industrial Enterprises* (the *General Guideline* hereafter), with specific requirements for greenhouse gas emissions accounting and reporting for 10 different industries, including enterprises in power generation, power grid, magnesium smelting production, aluminum smelting production, iron and steel production, civil aviation, flat glass, cement, ceramic production, and chemical production. These documents were co-published by the General Administration of Quality Supervision, Inspection, and Quarantine and the Standardization Administration of China. These represent significant progress, since these guidelines and requirements are the first official documents that specify the procedures and standards of MR. The pilot markets also require verification from third parties on historical emission data and that of the compliance year, intending to guarantee the reliability and accuracy of submitted data. In addition, admittance criteria for independent verification institutions have been set in order to assure that such institutions are qualified. The Beijing market examines verification reports,[19] and thus ascertains the quality of data through this "double check" procedure. However, if we look closely into the content behind the encouraging titles of these documents, vagueness still dominates. For example, in explaining the principle of data accuracy, which is a crucial part of effective MR, the *General Guideline* makes only a one-sentence brief summary (i.e., perhaps too brief!), that "…enterprises should try their best to avoid uncertainty or inaccuracy of data reporting."[20] With such crucial MRV policies unclear, the prospects for China's pilot markets -- and the national carbon trading market expected to be launched in 2017 -- will almost certainly remain in doubt as well.

[19] *Temporary Guideline on the Management of Beijing's Carbon Emission Trading* [北京市碳排放管理试行办法], People's Government of Beijing, May 2014, Article 11, http://zhengwu.beijing.gov.cn/gzdt/gggs/t1359070.htm

[20] *General Guideline of the Greenhouse Gas Emissions Accounting and Reporting for Industrial Enterprises*, General Administration of Quality Supervision, Inspection, and Quarantine and the Standardization Administration of China, p.3.