Regulatory Institutions and Market-Based Climate Policy in China

Coraline Goron and Cyril Cassisa*

Abstract
Domestic regulatory institutions are essential components of emissions trading systems (ETS). Not only do they shape the ways that markets operate, they also condition the environmental value of the carbon credits they produce. However, the literature on global carbon politics has paid little attention to local ETS regulators. In a decentralized system increasingly based on a noodle bowl of diversified environmental markets, the study of carbon markets must integrate the institutions in which they operate. This article focuses on China, which, due to its size, is both keen to and expected to have a significant impact on the global system of market-based instruments. We examine how China’s regulatory institutions have worked to implement the seven ETS pilots launched since 2012, and tease out some implications regarding how China’s national ETS may contribute to global climate change governance. In this study, we analyze both formal and informal regulatory institutions, through the practice of local actors. The main finding is that the tension between the state and markets in China’s ETS implementation has resulted in a reinforcement of state domination rather than the emergence of robust regulatory institutions. The contribution that the ETS makes to China’s emissions reduction is also limited by more pressing environmental and industrial policies that local regulators must prioritize. Local nonregulatory implementation practices could undermine the long-term objective to integrate China’s ETS with others under article 6 of the UNFCCC.

It was once said that China represented “the biggest test ever for the theory of carbon trading,” because “it will allow us to see whether or not a liberal market is necessary for producing environmental benefits” (Lo 2013). Since then, these doubts have been washed away by the assertiveness of China’s leaders that they would have an emissions trading system (ETS), and its enthusiastic reception by Western governments. This ETS has indeed provided a springboard for international cooperation, illustrated by its mention in the landmark US-China Joint

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Presidential Statement on Climate Change in September 2015, and by China calling the EU their ETS “teachers”1 (Biedenkopf and Van Eynde 2016).

China’s ETS is also an important piece of the post-Kyoto Protocol climate change regime that emerged from the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) in Paris, December 2015. There, China and its ETS were a mutually supporting pair, since China’s embracing of the ETS in its intended nationally determined contribution (INDC) has put it in a key position to normalize and spread this contested policy instrument beyond the club of advanced economies of the Organization for Economic Co-operation and Development (OECD; Mehling 2012). More importantly, China’s home-grown ETS provides it with the opportunity to become a rule-maker in the process of connecting the patchwork of local carbon markets that emerged outside the UNFCCC framework. This process is envisaged under article 6 of the Paris Agreement2 and is being pushed by market liberal institutions such as the World Bank, eager to build “a connected international carbon market that has liquidity, scale and the foundation for a long term, stable price on carbon.”3 China’s national ETS, which should cover 4 billion tons of CO₂ (roughly half of its CO₂ emissions, and twice the size of the EU ETS), and possibly raise the share of global emissions covered by a pricing mechanism from 13 to 25 percent, is expected to have a major global impact (World Bank and Ecofys 2016).

However, whether China will enhance or hinder this project depends on the way it implements its ETS internally, as well as on how the ETS is perceived by China’s international partners. Implementation cannot be understood independently from the institutions that support it, however. These institutions include both formal regulatory institutions and informal structures comprising “the ideas that … govern the development and operation of the system” (Duan 2015). Regulatory institutions, which should implement market rules impartially and independently from political power and market actors (Pearson 2005), are particularly crucial in the case of an ETS, because of the nature of carbon products, which are created by the interaction between regulatory institutions and complex market dynamics (Newell and Bumpus 2012). If China’s ETS was connected to allow cross-border trade with foreign markets, moreover, these domestic institutions would be involved to an unprecedented level in global governance.

These are compelling reasons to examine China’s domestic regulatory institutions, as incipient contributors to the institutionalization of a decentralized global climate change governance structure under the Paris Agreement.

1. Expression attributed to Special Climate Representative Xie Zhenhua, Carbon-Pulse, December 5, 2015.
2. The most up-to-date mapping of the initiatives is provided by the World Bank and Ecofys Carbon Pricing Watch 2016.
This article does so by examining how they have worked to implement China’s ETS pilots launched in 2012. What consequences can be teased out from this experience regarding whether China’s ETS can serve the goals of global climate change governance?

A preliminary step is to recognize a paradox in China’s ETS policy-making. On the one hand, it is perceived to rest on the power of the state rather than the market. On the other hand, the ETS is also expected to reform China’s “command-and-control” environmental governance system (Duan 2015; Zhang, Le-Yin 2015). This paradox reflects the key institutional dynamics that drove ETS implementation. In this article, we explore how these dynamics have played out in the practice of relevant actors, defined, following Adler and Pouliot (2011, 6), as “socially meaningful patterns of actions which, in being performed more or less competently, simultaneously embody, act out, and possibly reify, background knowledge and discourses in and on the material world.” Evidence for these practices comes from a variety of empirical sources, including nineteen interviews with ETS practitioners (experts and representatives of carbon business and government) in Beijing and Wuhan in 2013 and 2014, public presentations, and (social) media reports. Details about the interviews appear in Table A-1, www.mitpressjournals.org/doi/abs/10.1162/GLEP_a_00392).

The main finding is that, in spite of the Chinese central government’s objective to use the ETS as a way to transfer some governance to the market, in the pilots carbon trading has tended to reinforce the domination of state actors. Their control practices may have saved the pilots from repeating the failure of past experiments with SO₂ emissions, yet in doing so they have undermined the building of regulatory institutions necessary for the marketization and, later on, the internationalization process. The market environmentalist principle at the core of ETS theory, which is that markets are most efficient in pricing and allocating the burden to reduce emissions, was not institutionalized.

Second, the contribution of the ETS to China’s low-carbon transition does not easily translate into emissions reductions, which mainly stem from other “command” policies. The gap between China’s ETS’s high international profile and its relatively minor position in the domestic sphere can be explained by the dichotomy between a top leadership keen to align China’s climate policy with that of its international partners and the institutional legacies of its nonmarket economy at the local level. Finally, the fact that China’s regulatory institutions operate with different assumptions and political objectives undermines their principled adherence to the regulatory principles of independence and transparency, which are the foundations upon which China’s carbon markets might eventually participate in a global networked carbon market governance.

The rest of this article develops these arguments, starting with a presentation of the actors and structures that have directed China’s ETS policy. Then, we

4. Commitment endorsed by President Xi Jinping in the US-China presidential statement in September 2015, and upheld in its INDC.
turn to the analysis of local practices in the establishment of the compliance system and the market system of the seven ETS pilots, in separate sections that show how the practice tried to emulate, but ultimately differed from, regulatory standards. The final section connects those practices to the broader dynamics of China’s climate change policy and global climate change governance.

**China’s Carbon Markets: Local Experiments Under the Spotlight of International Climate Change Negotiations**

A common narrative of China’s ETS formation claims that Chinese leaders finally realized the limits of “command-and-control” policies to address climate change. Indeed, the official rhetoric introduced the ETS as a means to “let the market play a bigger role in resource allocation” (NDRC, 2014).5 A closer look at the historical policy process described below, however, reveals that political considerations may have played a bigger role, and also influenced the subsequent implementation.

**The Genesis of the ETS Pilots: Top-Down Pressure from the Interplay Between Domestic and International Political Dynamics**

In the run-up to Paris, China’s president Xi Jinping took a strong position to argue that climate change was not a Western plot to contain China (Gou 2010),6 but that China was tackling the problem “on its own initiative.”7 Nonetheless, Chinese policy-makers recognize that international pressure was instrumental to push Beijing to accept international commitments and adopt dedicated domestic policies to back them up.8

This international connection is at the root of China’s ETS, not only because the theory came from abroad, but also because it presented a series of advantages for the Climate Change Department (CCD) of the National Development and Reform Commission (NDRC), which, although a small and young institution created in 2008, was taking over from the Ministry of Foreign Affairs as the main negotiator for China in international climate change negotiations (Hart et al. 2015).

First, the ETS was supported by a series of international partners (the EU, the US, Australia, the OECD, the World Bank, etc.), and as such it was an important strategy to normalize China’s participation in global climate change governance following the Copenhagen summit in 2009, which had eroded its international image. In addition, the ETS could enhance international cooperation. Both are

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5. This language in the Interim Measures for the Administration of Carbon Emission Trading (NDRC, 2014) reproduced that of the Third Plenum of the 18th Communist Party Congress (November 2013) However, it no longer appears in the INDC, nor in the ETS draft legislation submitted to the State Council in March 2016.
6. Interview 2015-12-24-BJ-C-A.
8. Interview 2015-12-27-BJ-C-G.
key mandates of the CCD (Figure A-1, www.mitpressjournals.org/doi/abs/10.1162/GLEP_a_00392). At the same time, contrary to the implementation of the Kyoto Protocol’s Clean Development Mechanism, a domestic ETS also served the ambition to raise China’s profile as a global rule-maker, instead of a “rule taker” (Lo and Howes 2015).

Second, the ETS was the best option for a fast-track domestic climate policy response to international pressure. This is because, as is shown in Figure A-1, unlike other climate change policies the CCD could drive the ETS on the basis of its own competences, without having to bargain extensively with other ministries in the initial stage of implementation (Conrad 2010; Li et al. 2016). By contrast, a carbon tax would have entailed sharing responsibilities with the Ministry of Finance and would hinge upon a reform of the resource and environmental tax system (Deng et al. 2015).

Absent a climate change law that would clarify responsibilities, the ETS allowed the NDRC to minimize these institutional turf wars and reinforce its authority simultaneously on the international and domestic fronts. In Beijing, it could count on its own expert resources on carbon markets derived from its experience under the CDM (Li et al. 2016). In the provinces, it could mobilize vertical lines of authority with the Development and Reform Commissions (DRCs). The prospect of creating a high-level carbon financial service sector would later anchor the ETS to the NDRC’s overarching economic development mission (Qian and Yu 2015). By contrast, the ETS’s proposed superiority as a climate change policy instrument played a marginal role.

Implementing the ETS Pilots: Top-Down Pressure and Competition to Impress with Success as Key Drivers

The NDRC and the local DRCs were the main institutions rolling out the pilots, supported by experts and the semipublic environmental exchanges that would host the carbon transactions. For a long time, these institutions had limited interactions with economic actors, from which strong resistance could be expected. This was due to the fact that implementing the ETS required the DRCs

10. An environmental tax bill submitted to the State Council in June 2015 could be the vehicle for introducing a carbon tax, even though carbon does not figure in the list of targeted pollutants.
11. A climate change bill was first submitted to the State Council in 2012. It has undergone several rounds of revisions and public consultations, but has not yet been adopted.
12. Authority also involves getting other offices to cooperate, especially the offices of Industry and Information Technology (gongye he xinxihua chu), which are sometimes responsible (e.g., in Guangdong and Tianjin) for collecting energy consumption information.
13. Interview 2016-01-26-BJ-F-P.
14. Although the exchanges are for-profit entities, they serve public policy and are controlled by government-owned financial companies.
to transform themselves into market regulators, instead of their usual developmental and interventionist role in the local economy. But, as we detail below, this institutional transformation remains incomplete. Instead, to obtain cooperation from industry, the DRCs leveraged the pressure from the leadership in Beijing (Wang Shu 2014), combined with their influence on the local economy.\textsuperscript{15}

This resulted in creating what Ran described as a “pressurized system” (Ran 2013) pushing national policy targets onto local officials for the operation of the seven ETS pilots, chosen from among a number of volunteer localities in 2011 (two regions: Guangdong and Hubei; four cities: Beijing, Tianjin, Shanghai, and Chongqing; and one special zone: Shenzhen; Bo and Freeman 2013) (Figure 1). From the start, international exposure meant that the policy process was much more politicized than the previous SO\textsubscript{2} pilots. Just as Heilmann

\textsuperscript{15} Wang Shu mentioned that the ETS was put on the agenda of the CPC’s leading reform group, a sign of extreme political relevance. This was mentioned in the following interviews as the main reason to believe in the implementation of the Chinese ETS: 2014-08-06-BJ-C-E, 2014-08-07-BJ-C-G, 2014-07-23-BJ-F-P, and 2014-08-11-BJ-C-P.
described for experimentation in general, local leaders faced potential political rewards if they did well. At least, they could hope to secure influence on the future national system (Heilmann, 2008).

On the ground, however, experimentation was loosely coordinated by central authorities. Again, in line with the previous practice of policy experimentation, local officials in the pilots embarked on ETS-building independently from one another,\(^ {16}\) without guidance except for theoretical models and selected foreign experiences (Heilmann 2008). This led to important differences in design (industry coverage, allocation methods, methodologies to calculate and report \(\text{CO}_2\), inclusion of offsets, etc.), as well as in governance (the nature and quality of supporting regulation, compliance measures, etc.)\(^ {17}\).

Notwithstanding this fragmentation, the main political dynamic of the experimentation phase was a positive competition among the pilots to impress the leaders in Beijing and provide solutions for the national policy, which was developed by the NDRC in parallel.\(^ {18}\) Other localities realized the benefits and announced their own pilots (Zhejiang and Shandong, but also the industrial provinces of Hebei, Hunan, and Shaanxi), but eventually were asked to wait for the national ETS.\(^ {19}\) What constituted success was not clear, and there was a tension in the beginning between showcasing government authority, on the one hand, and promoting markets, on the other. The frontrunner pilots (Shenzhen, Beijing, Shanghai, and Guangdong) emphasized the measures they took to ensure industry discipline. By contrast, the Hubei pilot, which started a year later, showcased large trade volumes, supposedly to demonstrate that it “let the market play a greater role,”\(^ {20}\) as an alternative measure of success. In fact, though, Hubei’s attitude toward the market was no more liberal than the other pilots; it was simply courting private investors more actively.\(^ {21}\) By 2015, compliance and trade volumes had become the twin benchmarks of “good piloting,” but the rhetoric of “market free hand” was toned down in favor of praising the pilot officials who could innovate and solve problems.\(^ {22}\)

The attention from Beijing thus empowered local pilots to push forward ETS implementation, despite lacking the regulatory institutions to run an ETS (Engels et al. 2015). In this context, cost efficiency and market building were not first priorities. The analysis of the pilots’ practice in the following sections

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16. Local officials met increasingly often in trainings organized by the NDRC, but formal horizontal cooperation remained very limited.
17. Duan et al. (2014) have provided the most complete comparison of the pilots.
18. In 2012, China was the first to obtain \$8 million from the World Bank to build a national ETS.
19. Until 2015, it was not clear whether the national scheme would be a single, national ETS or a network of local ETSs. Several studies envisaged cross-regional linking, but only the linking of four cement factories in the city of Chengde, Hebei province, to the Beijing pilot was achieved.
20. Interview 2014-08-04-WU-C-G.
21. Interview 2015-12-17-BJ-C-E.
Table 1

<table>
<thead>
<tr>
<th>Pilots</th>
<th>Compliance Deadline 2014</th>
<th>Compliance Rate 2014</th>
<th>Compliance Publicity</th>
<th>Fine</th>
<th>Compliance Deadline 2015</th>
<th>Compliance Rate 2015</th>
<th>Compliance Publicity</th>
<th>Fine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shanghai</td>
<td>30 June</td>
<td>100% (191/191)</td>
<td>30 June</td>
<td>N/A</td>
<td>1 to 30 June</td>
<td>100%</td>
<td>30 June</td>
<td>N/A</td>
</tr>
<tr>
<td>Shenzhen</td>
<td>30 June postponed until 10 July</td>
<td>99.4% (631/635)</td>
<td>3 July publicized the list of compliant (631) and noncompliant (4) companies</td>
<td>4 noncompliant companies complied by July 10. No fine</td>
<td>2 June, postponed to 30 June</td>
<td>99.7% (634/636)</td>
<td>Names of two noncompliant companies published</td>
<td>Penalties announced</td>
</tr>
<tr>
<td>Guangdong</td>
<td>15 July</td>
<td>98.9% (182/184)</td>
<td>Publicized on 15 July; list of noncompliant companies (2) published on 2 August</td>
<td>2 noncompliant enterprises underwent fine procedure</td>
<td>2 June, postponed until 8 July</td>
<td>100% (184/184)</td>
<td>N/A</td>
<td>Not available</td>
</tr>
<tr>
<td>Tianjin</td>
<td>25 July</td>
<td>96.5% (110/114)</td>
<td>Publicized on 28 July; list of noncompliant companies (4) published on 15 June</td>
<td>no</td>
<td>31 May postponed to 1st July</td>
<td>99.1% (111/112)</td>
<td>N/A</td>
<td>Penalties announced</td>
</tr>
<tr>
<td>City</td>
<td>Date</td>
<td>Compliance Rate</td>
<td>List of Companies</td>
<td>12 noncompliant companies under went administrative fine procedure</td>
<td>Date Extended for 2 Weeks because 14 companies did not comply</td>
<td>Compliance Rate</td>
<td>List of 14 noncompliant companies published</td>
<td>Notes</td>
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<tr>
<td>Beijing</td>
<td>15 June, but postponed until 27 June</td>
<td>97.1% (403/415)</td>
<td>List of noncompliant companies (257) published on 19 June; update (12) published early September</td>
<td>12 noncompliant companies underwent administrative fine procedure</td>
<td>15 June but extended for 2 weeks because 14 companies did not comply</td>
<td>100% (543/543)</td>
<td>List of 14 noncompliant companies published</td>
<td>Not available</td>
</tr>
<tr>
<td>Hubei</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>29 May, then 10 July and 24 July</td>
<td>100% (138/138)</td>
<td>Compliance list published on 24 July</td>
<td>Not available</td>
</tr>
<tr>
<td>Chongqing</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>20 June, extended to 23 July, deadline extended</td>
<td>About 70%</td>
<td>Not available</td>
<td>Not available</td>
</tr>
</tbody>
</table>
demonstrates that the pressure from above unintendedly stood in the way of developing regulatory institutions.

**Regulatory Institutions and Control Practices of Compliance in the Pilots**

For experts mindful of China’s difficulties with enforcing environmental norms, and particularly the failure of the earlier SO$_2$ trading experiments, compliance was the test case for the ETS pilots (Chang and Wang 2010). The pilots proved the doubters wrong, by achieving a spectacular 98 percent official compliance rate in the first year and—except for Chongqing—almost 100 percent in the second (Zheng 2016; see Table 1). This section analyzes the practices that led to these results, in which innovative forms of state control preempted the emergence of at-length regulation.

**Mobilizing the Political Space for ETS Implementation: Educating, Punishing, and Rewarding**

When the first compliance period began in 2013, the overwhelming majority of Chinese industry had never heard of the ETS. Among those who had, many doubted whether the government was “serious.”$^{23}$ Companies’ collaboration was a precondition to implement the policy, however, because the DRCs needed the data to allocate CO$_2$ emissions credits. The pilots, then-NDRC vice chairman Xie Zhenhua emphasized, had to raise awareness and build capacity, a large—and still ongoing—effort carried out with the support of a variety of local, national, and international partners (Biedenkopf and Van Eynde 2016). In the pilots, not only was the government itself engaged, it also coopted a series of nongovernmental actors. In Beijing, for instance, besides trainings arranged by the DRC, the Environmental Exchange (CBEEX), a semiprivate entity in charge of registering trade in emissions rights, also organized 23 expert trainings.$^{24}$ Hubei’s Environmental Exchange (CHEEX) similarly traveled across the province to train companies’ executives.$^{25}$ Sometimes, even the entities chosen to verify the companies’ emissions got involved, to explain the calculation and collection methods.$^{26}$

Despite this active mobilization, many companies appeared totally unprepared to surrender emissions credits in June 2014. For them, stronger signals that the government “was serious about it” were necessary, but even those pilots who had passed legislation (Beijing and Shenzhen) could impose only limited

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23. Interview 2014-08-06-BJ-C-E.
24. CBEEX Presentation, German Chamber of Commerce in Beijing, December 14, 2015, on file with author. For more on semiprivate institutions in China’s climate change governance, see Schoeder (2012).
25. Interviews 2014-08-07-BJ-C-G and 2014-08-04-WU-C-P.
26. The practice was considered necessary to support the industry into compliance. Interview 2014-08-11-BJ-C-P.
<table>
<thead>
<tr>
<th>Region</th>
<th>Punishment Measure</th>
<th>Incentives</th>
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<tbody>
<tr>
<td>Shenzhen</td>
<td>Fine: 3 times of average market price in 6 months.</td>
<td>- Awarding of government projects.</td>
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<tr>
<td></td>
<td>- Deduction of insufficient allowances in next year</td>
<td>- Incentives to participate in carbon financial products</td>
</tr>
<tr>
<td></td>
<td>- Noncompliance fee that can exceed 100,000 RMB</td>
<td></td>
</tr>
<tr>
<td>Shanghai</td>
<td>Instruct to correct</td>
<td>Financial:</td>
</tr>
<tr>
<td></td>
<td>Fine: 50,000–100,000 RMB</td>
<td>- Green public funds</td>
</tr>
<tr>
<td></td>
<td>Negative points on the Public Credit Information System;</td>
<td>- Encouraging banks to provide loans (ex: Minsheng bank,</td>
</tr>
<tr>
<td></td>
<td>Negative impacts on access to bank loans and subsidy programs.</td>
<td>Shanghai Pudong Investment Bank, etc.)</td>
</tr>
<tr>
<td></td>
<td>Failure to submit GHG or verification reports Penalty 50,000 RMB</td>
<td>Political: prioritized access to government programs and</td>
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<tr>
<td></td>
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<td>subsidies</td>
</tr>
<tr>
<td>Beijing</td>
<td>Instruct to correct</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Fine: 3–5 times average market price;</td>
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<tr>
<td></td>
<td>Negative impacts on access to bank loans and subsidy programs.</td>
<td></td>
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<tr>
<td></td>
<td>Failure to submit GHG or verification reports Penalty 50,000 RMB</td>
<td></td>
</tr>
<tr>
<td>Guangdong</td>
<td>Instruct to correct</td>
<td>Financial:</td>
</tr>
<tr>
<td></td>
<td>Deduction of allowances in the next year</td>
<td>- Green loans</td>
</tr>
<tr>
<td></td>
<td>Fine: 50,000 RMB</td>
<td>- Support to financial institutions to provide green finance</td>
</tr>
<tr>
<td></td>
<td>Negative impacts on access to bank loans and subsidy programs.</td>
<td>Political:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Prioritized access to national and regional subsidy programs</td>
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<td></td>
<td></td>
<td>- Publicize compliance status</td>
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Table 2
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<tr>
<th>Region</th>
<th>Punishment Measure</th>
<th>Incentives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tianjin</td>
<td>Instruct to correct&lt;br&gt;Barred from government support policies for three years&lt;br&gt;Criminal responsibility</td>
<td>Government financial and political support. Details N/A</td>
</tr>
<tr>
<td>Hubei</td>
<td>Deduction of insufficient allowances in the next year&lt;br&gt;Fine: 1–3 times average past year market price of allowance;&lt;br&gt;Public shaming</td>
<td>Government financial and political support. Social monitoring. Bank support, etc. Details N/A</td>
</tr>
<tr>
<td>Chongqing</td>
<td>Fine: 3 times average market price in one month (not passed yet)</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Sources: Wang Shu (2014), Environomist (2014), and Munnings et al. (2014)

administrative penalties. The DRCs compensated by resorting to a wide range of tactics to induce compliance and resolve conflicts (Table 2). For instance, Shanghai, which achieved 100 percent compliance, deployed a multitude of sticks and carrots. Time-consuming individual meetings, “match-making” conferences between buyers and sellers, and even public shaming tools such as the “Shanghai Public Credit Information Platform,” were all used to make sure that companies knew that noncompliance would damage their government relations and impact on future development opportunities (Munnings et al. 2014). Similar practices were used in other pilots, though not always as effectively (Duan 2015). Industries bitterly complained in Beijing, Guangdong, and Hubei. In many cases, compliance was postponed until after private talks with officials solved the conflict. In one instance that made the headlines, the cement industry in Hubei, which represented a third of the target industry, rebelled against what they considered unfair treatment. Officially, the Hubei DRC did not compromise, and the industry complied “after talking the consequences

27. Shenzhen and Beijing passed local legislation short of the criminal-law level. The other pilots issued administrative regulations (and Chongqing, a notice). The national ETS law proposal foresees stronger penalties, including three to five times the average price of allowances, and deduction on allocations in the next compliance period (draft law, articles 31–35).
29. Many interviewees cited this practice as a model (Interviews 2014-08-06-BJ-C-C, 2014-08-07-BJ-C-P, and 2014-08-22-BJ-C-A). However, detailed investigations would be required to evaluate the extent to which these pressures were effectively applied.
of noncompliance with officials." Nonetheless, in this case as in others, many observers suspected some back-door deal, which could be partly responsible for the problems of overallocation examined below.

The Challenge of Implementing “At-Length” Governance

Monitoring, reporting, and verification (MRV) is a cornerstone of an ETS, because it is the system through which carbon emissions are created (i.e., calculated according to agreed formulas), reported to the regulators, and verified independently by private licensed entities, called “verifiers.” This regulatory system was unknown to China prior to 2011, outside of the small circle of CDM verification projects (Chen 2014). It was certainly new to most of China’s domestic industry. The pilots could not wait for Beijing to provide a single methodology, so they created their own. First, they created their own calculation formulas, which resulted in inconsistencies across the pilots. Harmonizing them has tested the control capacities of the central government. Another problem resulted from the fact that many pilots included “indirect emissions” from power and heat consumed in their jurisdiction (by industry and, in some pilots, also by buildings and cars), but produced elsewhere in China. This innovation, meant to suit China’s nonmarket power sector (Zhang 2014), created a peculiar situation of double counting of emissions.

Second, the pilots had to organize the enforcement of these technologies by the verifiers. This was an important challenge, because MRV typically rests on an assumption of “independent regulators” extended to nongovernmental institutions. China’s past efforts to import similar institutions in other sectors have had mixed results (Pearson 2005). In the case of the ETS, the monitoring and verification system must imperatively be robust and transparent, to ensure the environmental value of the carbon credits traded, which is crucial for investors and environmental policy-makers alike. “Transparency” became a catchphrase of the NDRC but it remained a serious problem on the ground (EUCCC, 2014). Each pilot used different (sometimes opaque) procedures to license private entities, some of which lacked credible technical competence and presented strong conflicts of interest.

32. Carbon emissions are calculated on the basis of CO₂ emission factors, which include energy consumption, production factors, and so forth.
33. The NDRC, in collaboration with the Danish (via the United Nations Development Program) and Australian governments, supplied national guidelines in 2014 and 2015. But these guidelines are general and not legally binding. Interviews 2014-08-29-BJ-F-P and 2016-01-26-BJ-F-P.
34. The regulated power sector cannot pass the carbon price down to consumers as it does in the EU. Interview 2014-08-29-BJ-F-P.
36. The ETS draft law mentions a centralized system of accreditation but without details (article 22).
In conclusion, each element of China’s compliance system significantly adapted ETS theory to local conditions. The result was a surprising efficiency in the short term, but at the cost of establishing regulatory institutions for the long term. This pattern, which reflects the characteristics of China’s political economy at large, and had already been identified in the practice of SO2 experiments (Tao and Mah 2009), also characterized the creation of markets in the pilots, to which we now turn.

**Regulatory Institutions’ Ambivalent Uses of the Market in China’s ETS Pilots**

In this section, we discuss practices of control in the management of the pilots’ carbon trade, which, though perceived as necessary to ensure the policy outcomes, prevented the emergence of a market-based “carbon price.”

**Incentives for Controlling Economic and Environmental Outcomes**

Emissions trading theory makes a specific promise to environmental policymakers: it reduces system-wide CO2 emissions at the minimum cost to the economy. This is achieved, in theory, because for any specific environmental target, the market finds the equilibrium price reflecting the most cost-efficient allocation of efforts to achieve it. Then, the progressive tightening of supply of carbon credits by regulators, via a decreasing “cap,” increases the price and incentivizes companies to make early investment in cleaner technologies (Healy et al. 2015). However, when the Chinese pilots were launched in mid-2013, the model EU ETS was deep in a crisis of oversupply and consequent low carbon price. For Chinese experts, this meant that the market could not be trusted to deliver the right price (Qi and Wang 2013) and that, at least in the beginning, tight government control was necessary.

In the pilots, however, control also served to balance environmental with economic interests.38 Hence, the ETS never exempted the DRCs from their primary mission to promote local economic growth. As a result, in a policy environment where a host of uncoordinated mandatory environmental and industrial measures directed from the top already burdened industry, they were keen to “make sure that it would not disturb anyone’s business”39 and to implement the local carbon price flexibly.40 In other words, Chinese officials “were not interested in the least in the price discovery aspect of the market.”41 The following paragraphs briefly describe these control practices, which are divided into quantitative interventions (cap management) and price interventions.

With regard to caps, most industry sectors in most pilots appeared over-allocated in 2014 and 2015 (Environomist 2016; Li et al. 2016). Whether this

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38. Interview 2014-08-06-BJ-C-E.
39. Interview 2015-12-17-BJ-C-E.
40. Interview 2015-12-27-BJ-C-G.
41. Interview 2016-01-18-BJ-F-P.
resulted from miscalculations or industry pressure is unclear, but, as we discussed above, suspicions of regulatory capture were widespread. Most of the data that would allow us to verify this are unavailable. Only two pilots, Guangdong and Hubei, published the total number of credits allocated, but not the amounts allocated to individual companies. Their emissions reports also remained confidential.

Furthermore, the allocation process was opaque, so that the actual cap was “often only the addition of the allocations in circulation” (Duan 2015). For instance, most pilots introduced ex-post adjustment mechanisms, whereby the DRCs would grant only parts of the allocations at the beginning of the compliance year, and the remainder after receiving their annual emissions report (Duan et al. 2014). This amount could be adjusted if the reported emissions varied from predictions. Other quantitative interventions included the sporadic use of allowance reserves, auctions (e.g., in Guangdong), and selective approvals of offset credit supplies. In theory, these tools were deployed to tailor the allocation to the market’s need, but in practice they more likely provided bargaining chips for companies and local officials to negotiate compliance ahead of the deadline (Figure 2).

The pilot DRCs also introduced price control mechanisms (price floors and ceilings). This is barely an exception in the field of “market-driven” ETSs, since regulators in several ETS jurisdictions, including the EU, have adopted similar mechanisms in response to carbon markets’ failure to produce “optimum” carbon price signals. The difference is that, in the EU for instance, price limits are perceived as a necessary evil that must be kept from interfering with market dynamics. The solution they found was to make the price-adjustment system automatic based on predictable market conditions (Wettestad 2014). By contrast, in China, where similar systems were put in place, several DRCs also preemptively voiced their price preferences. The carbon price was kept at around 50 RMB (€6.8) in Beijing and Shenzhen, and 20 RMB (€2.7) elsewhere throughout 2014 and 2015. A survey by the ICF and the China Carbon Forum corroborates the fact that market actors perceived government regulation and interventions to be

42. The DRCs had additional reserves to auction and because of discretion in the ways that allocations were distributed.
43. All but Chongqing.
44. Interview 2015-12-17-BJ-C-E.
45. Interview 2015-12-17-BJ-C-E.
the main factors affecting carbon prices (De Boer et al. 2015). In effect, prices only rose annually around the closing of the compliance period (Figure A-2, www.mitpressjournals.org/doi/abs/10.1162/GLEP_a_00392). They failed to react even to “releases on falling coal consumption, slowing GDP growth, and forced shutdowns of industrial over-capacity.”

Institutional Constraints on the Financialization of the Pilots

Chinese officials’ distrust of markets also influenced their approach toward financial investors. Whereas finance has played a critical role in developing carbon markets elsewhere (Paterson 2012), in China their involvement has been slow and protracted. Although many have advanced compelling arguments that only finance has the experience and the material interest to trade carbon assets, the DRCs feared market manipulation—and rightly so, since Shenzhen had to clamp down on precisely such market manipulations after they led to a price surge from 30 to almost 150 yuan per ton in the first few months of its operation. Regulatory and political barriers discouraged investors’ participation until Hubei reversed the trend a year later. Convinced that carbon markets had to be driven by finance, the CHEEX organized an auction of two million permits, targeted at private investors ahead of the market launch in May 2014, and immediately got record trade volumes. The NDRC was impressed, and adopted CHEEX’s slogan that an ETS “needs liquidity,” quieting criticisms that Hubei’s carbon deals were opaque and risky. The other pilots swiftly followed suit. In November 2014, Shanghai approved twenty trading houses, followed by Shenzhen and Beijing in December 2014.

Courting finance was not enough to boost trade, which remained comparatively slow (Figure A-3, www.mitpressjournals.org/doi/abs/10.1162/GLEP_a_00392). Private investors have been inhibited not only by flat prices and market opacity, but also by a prohibition of trade in futures, imposed by the national Securities Regulatory Commission (CSRC), that limited their operations. Whereas, for reference, almost all trade in the EU ETS comprises futures (Ringius 2016), only spot trade was allowed in the Chinese pilots. The reluctance

46. Stian Reklev, Beijing, Shanghai CO2 Prices Drop to All-time Lows as Fundamentals Catch Up, Carbon-Pulse, January 25, 2016. From 2016, overcapacity and uncertainty regarding the transition to the national system led to a deep plunge in carbon prices.
47. South China Morning Post, November 4, 2013.
49. In 2014, the Hubei pilot alone represented over 60 percent of the trade in all seven pilots.
51. According to Environomist (2016), from June 2013 to 15 July 2015, approximately forty-seven million allowances were traded across the seven markets, a mere 4 percent of their estimated combined annual cap (1.1 billion). For reference, in 2012, 7.9 billion allowances were traded on the EU ETS, which is more than three times the cap (2.1 billion).
52. Interview 2016-01-26-BJ-F-P.
53. Interview 2016-01-18-BJ-F-P.
54. Spot transactions refer to an exchange of values at an agreed price on the spot date, contrary to forward transactions which are for an agreed price at a later date.
of the CSRC led to a turf war with the NDRC, whose ambition to develop the national ETS into a market worth 400 billion RMB was jeopardized. The prohibition was jeopardized.\textsuperscript{55} NDRC thus allowed the pilots to start financial carbon product “study projects.”\textsuperscript{56} Shenzhen, Hubei, and Shanghai swiftly moved to set up public-private carbon funds and began issuing corporate bonds and loans using carbon credits as collateral (Environomist 2016, Sino-Carbon 2015).\textsuperscript{57} Guangdong even established a Carbon Futures Exchange in its new Nansha free-trade area in 2016.\textsuperscript{58} Nevertheless, these projects would hardly be scalable without the green light of the CSRC and without substantial improvements in terms of regulatory risks and market transparency.\textsuperscript{59}

Chinese leaders and experts in Beijing are keenly aware of these impediments. But pursuing the necessary transformation hinges on a more difficult change in the kind of symbiotic relationship that local governments enjoy with businesses, and that paradoxically supported compliance in the pilots. Moreover, once governments were on board, these privileged ties were instrumental in kicking off the above-mentioned carbon finance projects. Notably, state-owned enterprises, which represent a significant share of the compliance industry, have been at the forefront of carbon product testing: the first carbon fund, established in Hubei province in November 2014 with 50 million RMB, was set by the China Huaneng Power Group; the first carbon bond was issued by China General Nuclear Power; and one of the first loans with carbon collateral involved Huadian New Energy. Without government backup, the financial risk of these novelties, which mainly rely on China’s underdeveloped market for carbon offset projects, would likely have put them off (Environomist 2016).

\textbf{Implications of the Chinese Pilots’ Practice for Climate Policy}

The discussions above showed that the kind of government interventions observed in the Chinese pilots went far beyond even the extensive market regulation expected of an ETS (Jotzo 2013). Tellingly, one interviewee understood ETS to be a “command economy style” market, driven by policy targets and plagued by similar rigidities.\textsuperscript{60} The practice of the ETS pilots has revealed that in the emerging “Climate Capitalism with Chinese Characteristics,” control and the market are an immiscible pair. The carbon price in China was driven principally


\textsuperscript{56} Interviews 2016-01-26-BJ-F-P, 2016-01-18-BJ-F-P, 2015-12-17-BJ-C-E, 2015-12-24-BJ-C-A.

\textsuperscript{57} The Environomist report offers the most up-to-date repertoire of carbon finance products experimented until 2016.

\textsuperscript{58} Carbon-Pulse, April 21, 2015.

\textsuperscript{59} Huang, Tantiaoyi, September 9, 2016; Interviews 2016-01-18-BJ-F-P and 2015-10-23-BJ-F-E.

\textsuperscript{60} Interview 2015-12-24-BJ-C-A.
by the actions of the government rather than the market, with very strong structural incentives for them not to relinquish control. Thus, whereas Beijing has been keen, in principle, to use the ETS to guide institutional change toward a more “scientific, rational and orderly” governance style, instead of relying on the unpopular “iron hand”\textsuperscript{61} pursuit of targets (Qian and Yu 2015; Zhang, ZhongXiang 2015), in practice the ETSs have mainly reinforced the DRCs’ control over the companies in their jurisdiction.

Some of the shortcomings discussed were admittedly due to the experimental nature of the Chinese pilots. The draft ETS law proposed by the NDRC to the State Council in March 2016 is especially intended to beef up regulatory capacity. However, local governments have denounced the NDRC’s plan to implement a centralized system through which it would tighten control over local practices (NDRC 2016).\textsuperscript{62}

All this has happened far from international climate change negotiations. However, this analysis was necessary to show that, contrary to appearances, market environmentalism as it is understood in the West has not yet taken root in China, and that a gap exists between the prominence of the ETS in China’s climate diplomacy and its comparatively minor relevance in the domestic sphere.

From the analysis in the first section, a possible explanation for this gap lies in the NDRC’s strategy to carve a central role for itself between two arenas: the ETS constituted the best option to raise China’s international profile on climate change and provided space for cooperation with its main negotiation partners (the EU and the US), while at the same time securing the NDRC’s leading position in domestic climate policy-making.

All the same, the ETS is unlikely to make a significant contribution to China’s INDC. Locally driven economic growth will never easily be trumped by environmental considerations; climate change and the ETS will continue to come after a host of other measures, undertaken in the more pressing “annihilation war” against pollution\textsuperscript{63} and industrial overcapacity plans. There is no discussion of doing away with these policies so as not to interfere with a putatively self-sufficient ETS (OECD 2011). In fact, whereas the idea that China “needs a carbon price” remains powerful in expert circles,\textsuperscript{64} the recent success in slowing CO\textsubscript{2} emissions growth may be mostly a side-effect of these other policies, which include substantial subsidization of technological upgrading and “strategic” clean industries (to the tune of an estimated $90 billion in

\textsuperscript{61} In December 2011, former Premier Wen Jiaobao instructed local governments to achieve the energy saving and emissions reductions targets of the eleventh five-year plan, leading some local governments to cut electricity to firms, and even entire neighborhoods. Xinhua. May 5, 2010.

\textsuperscript{62} Also see Chai Qimin, Lun tanpaifang jiaoyi zhi quanguo shichang [On the National Emissions Trading Market]. Caixinwang, March 29, 2016.

\textsuperscript{63} Zheng Jianzhong et al., Zhongguo kongmei jianmeizhan, jidai guangre “xin wuqi” [China’s Annihilation War on Coal Urgently Needs a “New Weapon”]. Jingji ribao, April 14, 2014.

\textsuperscript{64} Interviews 2016-01-22-BJ-C-A and 2015-12-27-BJ-C-G.
2014) and the closure of thousands of backward thermal-power, cement, and steel plants (Green and Stern 2015; Li et al. 2016).

Any role for China’s ETS in “green global capitalism” via a transnational carbon market is also constrained by the implementation issues we described. The NDRC and some of the economically most advanced provinces may have realized that carbon markets could spur new cycles of growth, compatible with the national industrial policy objective to nurture the service and finance industries, but they have yet to realize how much institutional transformation would be necessary for this to happen.

Any form of linking (cross-border trade) would put the Chinese claims in question and entail direct scrutiny by foreigners wary not to compromise the environmental integrity of their own schemes. The World Bank has acknowledged these concerns. A key aspect of its “networked carbon market initiative” is to find a formula to assign different “climate mitigation values” to credits emanating from different jurisdictions, so as to enable cross-jurisdiction trade while “discounting” the institutional differences affecting compliance and environmental integrity. Thus far, however, linking remains a distant project. Even among the most optimistic, this is unlikely to happen before 2025, provided that nonpilot regions follow and that the leadership does not release the pressure. It would be naïve to think that Chinese negotiators can agree to a supranational valuation of China’s carbon credits that would inevitably put it in a disadvantaged position while putting pressure on its climate diplomacy.

Conclusions

This exploration of China’s ETS pilots has shown that, indeed, China represents a major test for ETS theory, although the point is less about liberal markets and more about how the state shapes their operation. The diffusion of the ETS concept does not necessarily imply full convergence on market environmentalism principles (Fuhr and Lederer 2009). On the contrary, adaptive local practices impact the ways that local regulatory institutions fit into a global climate change governance framework. Local institutions are even more relevant in the field of carbon trading, where the objective of creating a global carbon price signal pushes the “noodle bowl” of local ETSs toward integration. In this process, China emerges as an unavoidable yet ambivalent rulemaker, because of unresolved tensions between state and market in its regulatory practice. A next step would be to compare the Chinese practice with other jurisdictions, especially in developing countries, so as to deepen our understanding of the contribution of carbon politics to the global governance system (Purdon, 2015), which is no longer focused on distributing top-down

65. Interview 2016-01-26-BJ-F-P.
66. Interview 2016-01-18-BJ-F-P.
targets, but rather on connecting, reviewing, and comparing individual climate actions.

References


