

2019 CHINA CARBON PRICING SURVEY

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Abstract

This report summarises the results of the *2019 China Carbon Pricing Survey*. The survey elicited expectations about the future of China's carbon price from stakeholders in carbon markets in China during August-October 2019. Through cooperation with industrial associations and engagement at large-scale capacity building exercises, the project team reached a wide range of representatives from China's carbon-intensive industries, especially power generation, which are already subject to, or are soon expected to be subject to carbon pricing. As the largest survey of its kind yet conducted, the results give strong confidence that carbon price levels in China will rise over time, and that carbon pricing will increasingly affect investment decisions. The Chinese government is implementing its development plan for a national emissions trading system, with the majority of survey respondent indicating that they expect the carbon trading market to kick off next year. In preparation for the national ETS, significant capacity building has been conducted. ETS is expected to be an important policy instrument to motivate companies to reduce GHG emissions in the coming decade, as part of a suite of policy tools. There is strong confidence that China will meet its target to peak emissions by 2030. Many expect that the peak in emissions may be reached significantly earlier.

Keywords

Carbon pricing, emissions trading, carbon market, public policy, stakeholder survey, China

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Acronyms:

CCER China Certified Emission Reduction (offset system)

CNY Chinese Yuan

ETS Emissions Trading System

MEE Ministry of Ecology and Environment

MRV Monitoring, Reporting and Verification

NDRC National Development and Reform Commission

TCE Tons of Coal Equivalent

tCO₂e Tons of CO₂ Equivalent

Executive summary

This report is a summary of results from the *2019 China Carbon Pricing Survey*, jointly conducted by China Carbon Forum, ICF, and SinoCarbon, with inputs from the Dutch Emissions Authority and the Norwegian Environment Agency.

The survey, undertaken from August to October 2019, obtained expectations about the future of carbon pricing in China from 389 stakeholders. The survey is a collective “best guess” by these stakeholders. It does not claim to be representative, but it does provide an indication of dominant stakeholder views about the likely future of carbon pricing in China. The project builds on similar surveys conducted in 2013, 2015, 2017 and 2018.

China’s carbon market progress

Since 2013 and 2014, pilot carbon markets have been in operation in five municipalities (Beijing, Chongqing, Shanghai, Tianjin and Shenzhen) and two provinces (Guangdong and Hubei). Fujian province also launched an ETS in late 2016. In recent years, these pilot regions have further developed their markets by expanding coverage, refining their operation rules including allocation mechanisms, and introducing derivative products.

This year’s survey comes as China prepares to move from the capacity building phase of the development of its national emissions trading system, to the trial trading phase, as outlined in the ‘Development Plan’ for a national ETS which was released in December 2017. The national ETS will start with the power generation sector next year and is expected to gradually cover other sectors once certain conditions are met. On 30 September 2019 the Chinese Ministry of Ecology and Environment (MEE) released a trial plan for allocating emissions allowances to the power sector.

The survey also comes at a time of global interest in China’s implementation of carbon pricing. The USA has just formally withdrawn from the Paris Agreement, and observers are closely watching the actions of other large emitters. Negotiations on implementation rules of the Paris Agreement are also ongoing, including Article 6 which would allow for international trading of mitigation outcomes.

Respondents

The survey received 389 responses from professionals in a range of sectors, including industry (63%), market-related service companies (17%), industry sector associations and local government (4% each), academia and carbon exchanges (3% each). Over half of all respondents (56%) are from companies either covered by regional emissions trading systems or likely be included in the forthcoming national ETS.

32% were from provinces with pilot carbon markets, 67% from non-pilot regions, with the remaining 1% from organisations not based in mainland China.

The concentration of responses from Beijing, 19%, has reduced since previous surveys (2015: 43%, 2017: 37%, 2018: 22%), reflecting a growing engagement in carbon markets across the country.

It is likely that on average the those who responded to the survey are more involved in preparation for the carbon market than those which didn’t respond, leading to some bias towards upbeat expectations about carbon pricing. We have sought to mitigate this effect by working with sector associations to elicit more representative industry responses.

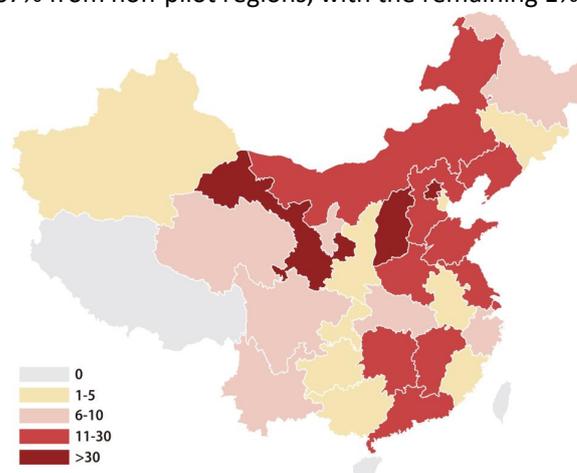


Figure 1 Location of respondent organisations.

China's national ETS

Our survey respondents were asked by when they expect China's national ETS to be fully functional. Only 12% of respondents expect this to occur by 2020 or earlier (down from 19% in 2018 and 47% in 2017).¹ However, 82% of respondents expect a fully functional carbon market by 2025 (up from 72% last year).

Respondents expect carbon emissions trading to increasingly affect investment decisions in coming years. In 2020, 47% of those who responded to this question expect investment decisions to be strongly or moderately affected. By 2030 this figure rises to 76%, and by 2050 to 78%.

Carbon emissions trading is expected to increasingly affect investment decisions

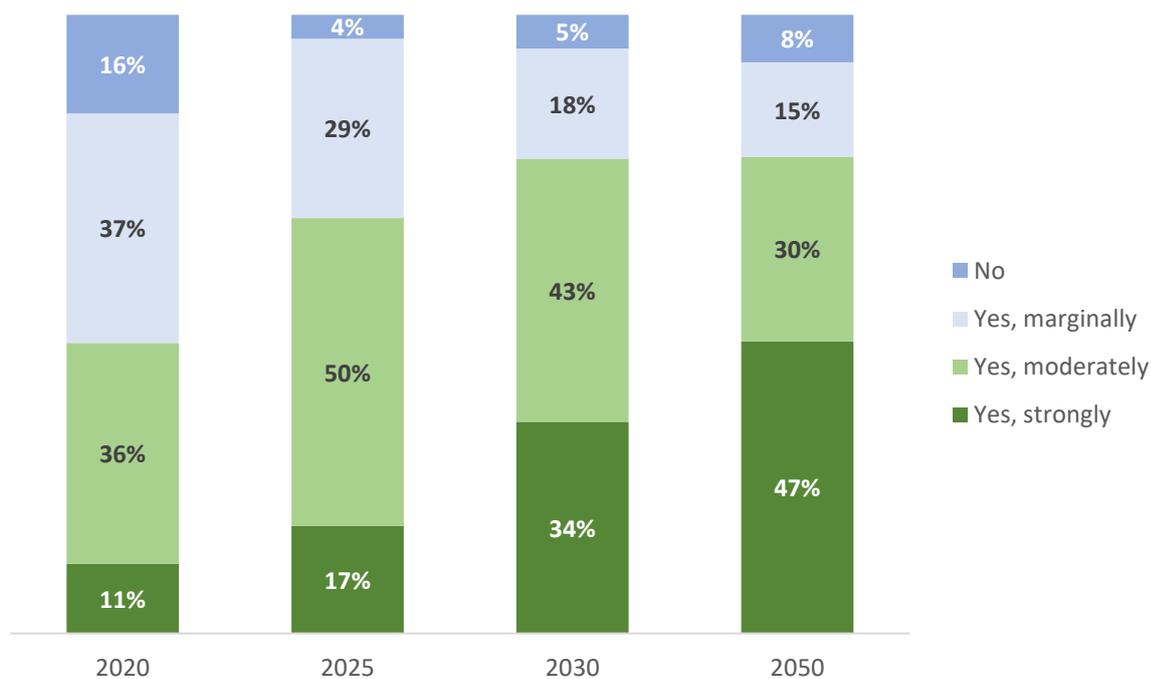


Figure 2 Do you expect the ETS in China to affect investment decisions in 2020, 2025, 2030, 2050? (n=362,360,346,324)

Price expectations

Average price expectations in the national ETS are CNY 43/ton in 2020, CNY 75/t in 2025 and rises to CNY 116/t by 2030. In this year's survey we asked for the first time about stakeholders' carbon price expectations to mid-century, in order to get a sense of how carbon pricing may play a role in China's mid to long-term decarbonisation strategy. Average carbon price expectations for 2050 are CNY 186/ton. However, the price levels remain highly uncertain, especially in the more distant future. The 20th-80th percentile range grows from CNY 30/t to CNY 150/t in 2030 to CNY 30/t to CNY 300/t in 2050. The price expectations up to 2025 are about 20% lower than at the time of the 2018 survey.

¹ Full text of question: "By when do you expect China national ETS to be fully functional? e.g. all key building blocks in place, including: legislation/law, cap and allocation management, complete MRVA system, registry, trading platforms, market oversight, etc."

China's carbon price is expected to steadily rise

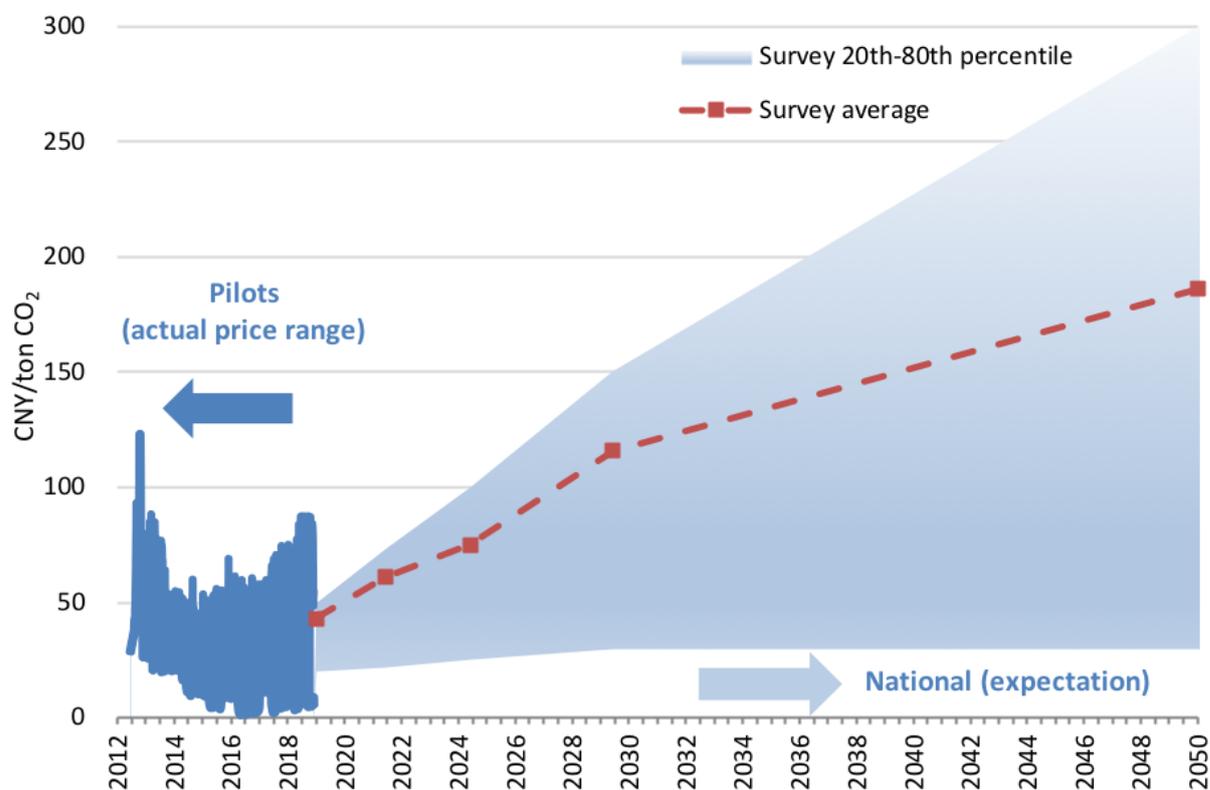


Figure 3 Range of prices in the pilot systems to-date, and estimated prices for the national system.

Carbon pricing in the mix of policy instruments

Respondents were asked what they expect to be the most important mix of policies and tools to reduce GHG emissions in future years (Figure 4). The expectation is that, over time, the emphasis will shift towards new and market-based instruments such as ETS, environmental tax, information disclosure, energy allowances trading, and shift away from more traditional command and control policies and tools.

The share of responses identifying emissions trading as one of the most important policies drops from 25% in 2020, to 21% in 2030 and 20% in 2050. This most likely reflects an expectation of a more diversified portfolio of environmental policies and tools over time. Of the respondents who identified ETS to become the main policy instrument to reduce GHG emissions in 2020, but not in 2030 or in 2050, the largest number of respondents shifted their expectation to environmental tax, which also involves a price on carbon emissions. In aggregate, carbon pricing (both ETS and tax) is expected to be the main policy tool for GHG emission reductions in China.

Market-based measures are expected to become the main policy instruments

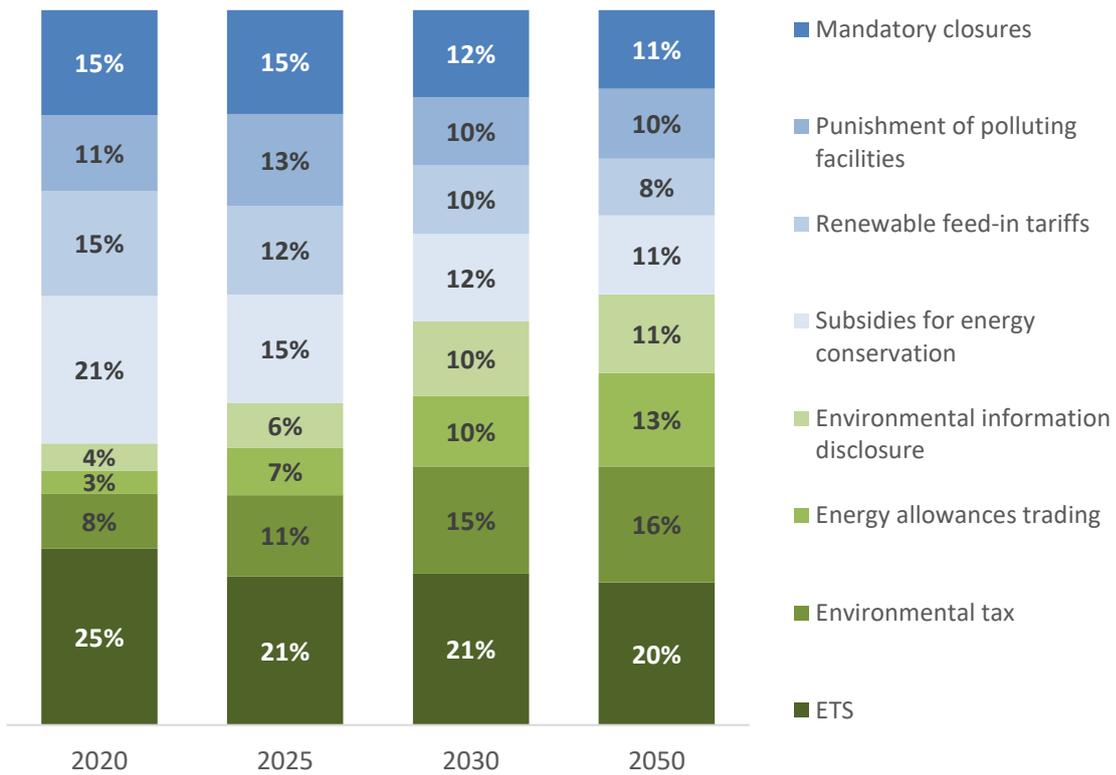


Figure 4 Which do you expect to be the most important policies in motivating companies to reduce GHG emissions in China at different points in time? (n=383)

China’s emissions targets and peak emissions

81% of respondents expect China to achieve a peak in carbon emissions by 2030, and 36% expect China’s emissions to peak by 2025 or earlier. This is down from 87% and 48% in last year’s survey respectively. Nonetheless, this survey shows continued confidence that China will meet its 2030 peaking target.

China’s emissions are expected to peak ahead of 2030

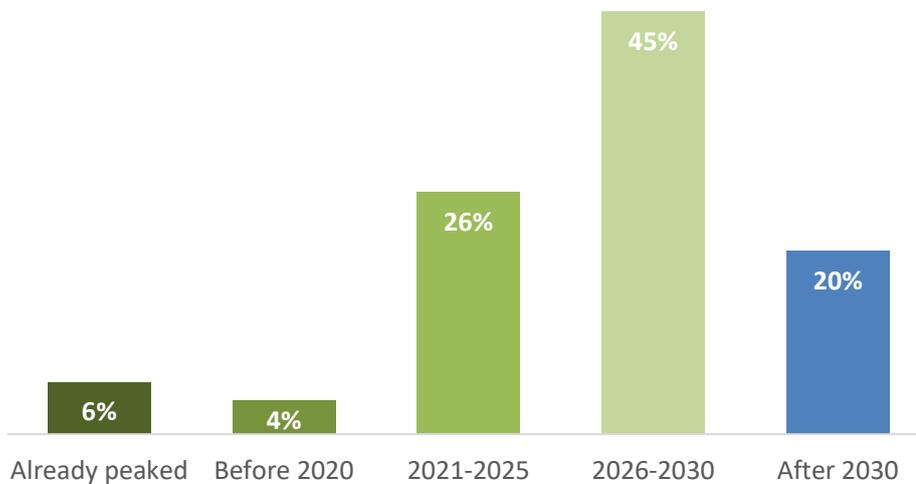


Figure 5 When do you expect China’s emissions will peak? (n=362)

Survey introduction

This report presents the results from the *2019 China Carbon Pricing Survey*, jointly conducted by China Carbon Forum, ICF and SinoCarbon, with the support of China Electricity Council, China Cement Association, and the China Non-ferrous Metals Industry Association, with inputs from the Dutch Emissions Authority, and the Norwegian Environment Agency. The project builds on similar surveys conducted in 2013, 2015, 2017 and 2018. Many of the questions asked were the same in each of the three surveys, and results were compared over time. Through the cooperation with related industrial associations, strong efforts were made to survey representatives from China's carbon-intensive industries, with a special focus on the power sector, which is soon expected to be subject to carbon pricing.

This year's survey comes as China prepares to move from the capacity building phase of the development of its national emissions trading system, to the trial trading phase, as outlined in the 'Development Plan' for a national ETS which was released in December 2017. The national ETS will start with the power generation sector next year and is expected to gradually cover other sectors once certain conditions are met.² On 25 September 2019 China's Ministry of Ecology and Environment (MEE) released a trial plan for allocating emissions allowances to the power sector.

The survey also comes at a time of global interest in China's implementation of carbon pricing. The USA has just formally withdrawn from the Paris Agreement, and observers are closely watching the actions of other large emitters. Negotiations on implementation rules of the Paris Agreement are also ongoing, including Article 6 which would allow for international trading of mitigation outcomes.

China's government has committed to specified emission reduction targets, to reduce the nation's carbon intensity of the economy by 40 to 45 percent from 2005 levels by 2020, and by 60 to 65 per cent by 2030.³ By the end of 2018, the 2020 target had been over-achieved (45.8% reduction from 2005), meaning that China is also on track to meet its 2030 target.⁴

In a period of around twelve weeks (August-October 2019), the survey received 389 responses from professionals in a range of sectors, including industry, consultancies, academia, carbon finance, local government and research institutes. Over half of all respondents are either covered by regional systems or are likely to be included in the forthcoming national ETS. Industry responses to the survey have been encouraged by their relevant sector associations, as well as following large-scale ETS trainings.

² The other sectors expected to eventually be covered are those detailed in the government's regulations on monitoring and reporting of carbon emissions, i.e. petrochemicals, chemicals, building materials, steel, non-ferrous metals, papermaking and aviation. See 国家发展改革委办公厅关于做好 2016、2017 年度碳排放报告与核查及排放监测计划制定工作的通知: http://qhs.mee.gov.cn/tscjs/201904/t20190419_700399.shtml

³ Carbon intensity refers to the level of carbon emissions per unit of GDP (CO₂/CNY GDP).

⁴ 新闻办就《中国应对气候变化的政策与行动 2019 年度报告》有关情况举行发布会: http://www.gov.cn/xinwen/2019-11/27/content_5456146.htm

In addition to the survey itself, the project team conducted two industry stakeholder roundtables on ETS, focused on ‘Carbon Pricing and Competitiveness’, and ‘The Role of Auctioning in an ETS’. The roundtables involved industry representatives and sectoral associations, together with government experts on carbon market development. The aim of the roundtables is to provide a channel for communication of industry opinions on ETS design to policymakers, and to expand the scope of public discourse on these important aspects of the national system. Links to the public reports from the roundtables can be found on the China Carbon Forum website.

This survey gauges expectations by experts and market participants about the future of carbon pricing in China, and how it fits into China’s broader climate change mitigation efforts. It quantifies expectations about market design decisions, relevant policies, carbon prices, and the impact on investment decisions. As such, it can make an important contribution to improving understanding for the markets and for policymakers, of how the prospects for carbon pricing are perceived in the industry and expert communities.

The expectations elicited in this report are best interpreted as an aggregation of “best guesses” by a subset of people who have knowledge and informed views about the factors that will affect the operation of carbon pricing in China. For industry respondents, the survey’s sample may be biased towards market participants with a higher than average level of preparedness, given that less well-prepared companies may have less certainty regarding the carbon market, and therefore be less willing to complete a survey. We have sought to mitigate this effect by working with sector associations to elicit more representative industry responses. In addition, industry has been receiving continuous capacity building support since the last edition of the survey.⁵ There is no claim that the survey is representative of the views of all experts and industry on these questions, both because it is not possible to create a representative list of experts, and due to self-selection by those who chose to respond to the survey.

The expectations about future carbon prices derived from surveys such as this differ conceptually from forward prices in markets, which reflect market expectations but adjust them for risk and are subject to demand and supply of capital. They also differ conceptually from forecasts of prices that are based on quantitative analysis of underlying market factors, and assumptions about policy settings.

This report begins with an update on the status of carbon emissions trading in China to-date. It then outlines the key result from the survey, covering the experience of the pilot systems, expectations about the national system, the readiness of enterprises, the impact of carbon pricing on investment decisions, the role of ETS in relation to other policies, and expectations about the peaking of China’s carbon emissions. This report is intended to objectively present the opinions of respondents as a reference for policymakers and market participants.

⁵ For example, since December 2018 the EU-China ETS Platform has held trainings for approximately 5,300 industry and local government representatives in 20 provinces. About 60% of the participants in these trainings have been local government representatives. The trainings conducted by MEE in late 2019 have included approximately 5,200 participants, with about two thirds being industry representatives.

Update on carbon emissions trading in China

Beginning in mid-2013, eight regional emissions trading systems were introduced in different parts of China (Shenzhen, Shanghai, Beijing, Guangdong, Tianjin, Hubei, Chongqing and Fujian), providing valuable experience for the central government in developing a national carbon pricing mechanism. Each province has its own carbon intensity target and China's regional emissions trading systems have so far also adopted carbon intensity-based caps, rather than an absolute emissions cap, which is the case in other emissions trading systems internationally. This approach has been judged by the Chinese government as best suited to achieve the dual demands of economic growth and emissions reduction.

In December 2017, China's National Development and Reform Commission (NDRC) announced the official launch of the much-anticipated national emission trading system (ETS), marked by the release of the *Development Plan for Construction of the National Emissions Trading System (Power Sector)*, (the "ETS Development Plan"). The national ETS will start with the power generation sector, and gradually cover other sectors once certain conditions are met. The ETS Development Plan outlines the targets and roadmap for the development of the national ETS, specifies the remaining work required to enable the start of trading activities, and confirms a three-phase roadmap: a foundational phase, a simulation trading phase, and a market operation phase. According to this roadmap, simulation trading is expected to begin around the end of 2019, with the deepening and expanding phase starting approximately one year after the simulation period is launched.

In 2018, China undertook a major governmental restructuring program. After the restructuring, responsibility for the development of the Chinese national ETS now falls to the Ministry of Ecology and Environment (MEE). Data collection among power generation entities has started in May 2019, preparing for allocation, registry and market operation of the national ETS.

Recent highlights

Monitoring plans, data reporting and verification for 2018

On January 17 this year, the MEE issued a notice requiring reporting and verification of 2018 carbon emissions data, as well as the development of monitoring plans for future MRV work in eight industrial sectors: petrochemicals, chemicals, building materials, iron and steel, nonferrous metals, papermaking, electricity, and aviation. The notice requires that accounting and reporting be completed by March 31, while verification, review and submission should be completed by May 31.

This was the first notice related to MRV work released by MEE after the restructuring. Compared with the requirements for 2016-17, there is no fundamental change regarding the sectors, thresholds, and compliance timelines. The major changes lie in two aspects. First, the verification of the implementation of a monitoring plan is now required. Second, for the iron and steel sector, some modifications are made in terms of additional data requested for allocation purpose.

Interim Administrative Measures on Emission Trading (Draft for Comment) released by MEE, providing legislative basis for the national ETS

In April 2019, the *Interim Administrative Measures on Emission Trading (Draft for Comment)* was released, which is the first major policy released by MEE after restructuring. The regulation will serve as a legal framework for the construction and operation of the national ETS after its formal promulgation in the future. Although it is still at the stage of soliciting opinions, the regulation sent a signal that the national ETS is being actively promoted and strengthens market confidence.

Data collection begins in the power sector, preparing for allocation, registry, and market operation of the national ETS

In May 2019, MEE issued an official notice requiring provincial authorities to organise submission of the list of key emission entities and related materials for the power sector covered by national ETS, in order to prepare for allowance allocation, registry, and market operation.

According to the notice, the scope covers power generation entities with annual emissions of at least ~26,000 t/CO₂ (energy consumption of more than 10,000 tce) in one year over the period of 2013-2018. It was noted that captive power plants owned by companies in other sectors are formally included within the scope.

Trial Plan for National ETS Allocation for Power Generation released

On September 25, MEE released a trial plan for allocating emissions allowances to the power sector. This plan is expected to be the basis for further refinement of the allocation plan for the upcoming simulation phase of China's national ETS.⁶

The trial plan adopts benchmarking method for allowance allocation and includes two allocation systems, which are identical in most respects but differ in their benchmarks. According to the Plan, entities will first receive allowances at 70% of their 2018 power supply level multiplied by the corresponding benchmark factor. Allocation will be adjusted ex-post reflecting the actual generation in 2019.

The trial allocation plan was accompanied by a notice of trainings on allowance allocation and management by MEE, which were conducted between October and early December 2019 and attended by key staff from provincial authorities and power generation entities from every province in China. The trainings aimed to raise the competencies of participants in the national ETS and demonstrate the feasibility and rationale of the trial plan. The trainings covered China's climate change policies and preparations for the national ETS, including compliance issues for provincial departments and regulated entities, such as: management of emissions data reporting, allowance allocation, trading, surrendering of allowances, as well as the registry system, trading account management and the trial calculation of allowance allocation and simulation trading.

⁶ 2019年发电行业重点排放单位(含自备电厂、热电联产)二氧化碳排放 配额分配实施方案(试算版): <http://www.mee.gov.cn/xxgk2018/xxgk/xxgk06/201909/W020190930789281533906.pdf>

Annual Report on China's Climate Change Policies and Actions released

On November 27, MEE released its Annual Report on China's Policies and Actions for Addressing Climate Change for 2019. The report stated that China is steadily pushing the development of a national carbon market by establishing and improving the institutional system, developing its supporting structures, and carrying out capacity building. It has drafted the *National System for Allowance Setting and Allocation of Carbon Credits*, the *Technical Guidelines for Allowance Allocation in the Power Sector*, as well as supporting policies and regulations including management measures for reporting, auditing, and trading GHG emissions for key emitters, all of which are expected to be released in the next year. Meanwhile, the pilot carbon markets will continue to develop, and the government will promote reform of the Chinese Certified Emission Reduction (CCER) offset mechanism. At the press conference for the report, Zhao Yingmin, Vice Minister of MEE, said that it can be expected to see an open and transparent trading market with established systems and active trading by 2025.

Transaction data for China's carbon market

Pilots

As of September 30, 360 million tons of allowances had been traded in the primary and secondary markets since the markets began, with a value of CNY 7.8 billion. The regional markets can be divided into three groups by transaction volume and value from the highest to the lowest: 1) Guangdong; 2) Hubei, Shenzhen, Shanghai, and Beijing; 3) Tianjin, Chongqing, and Fujian.

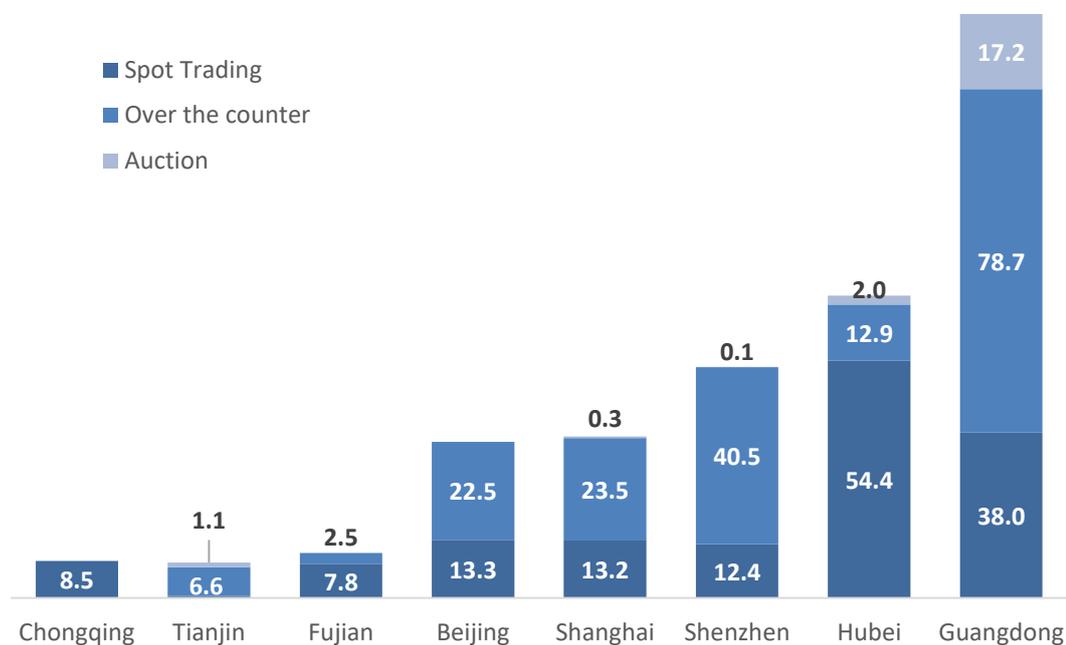


Figure 1 Cumulative trading volume in the 8 regional markets to September 30, 2019 (million tons).

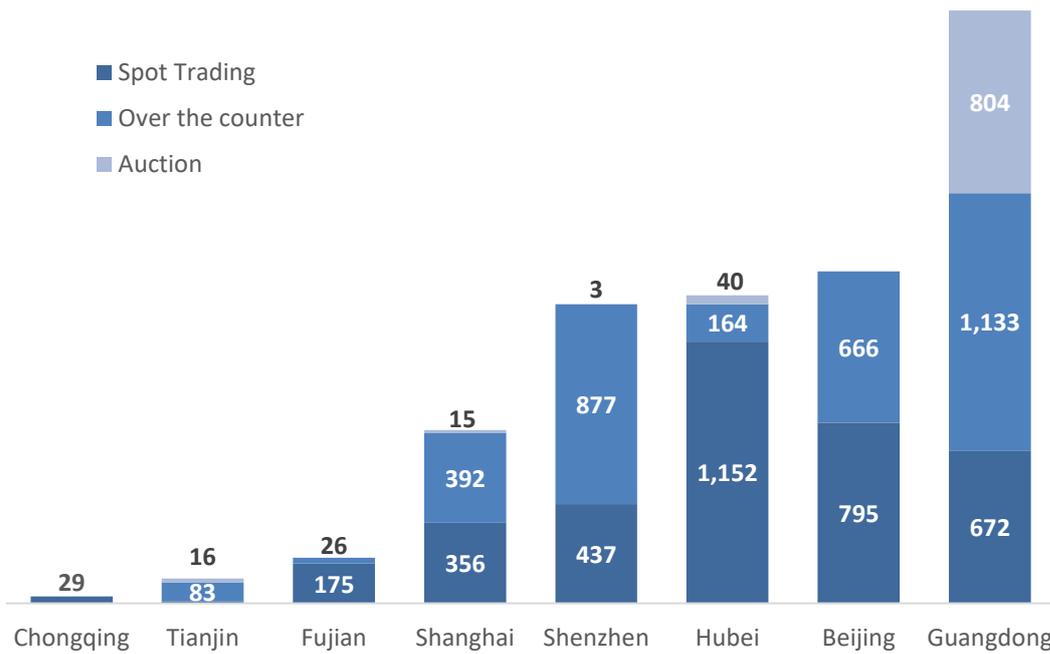


Figure 2 Cumulative trading value in the 8 regional markets to September 30, 2019 (million CNY).

For each compliance period, the trading volume in the regional pilots has seen an upward trend year on year, and the 2018 compliance year saw a significant increase in both trading volume and value.

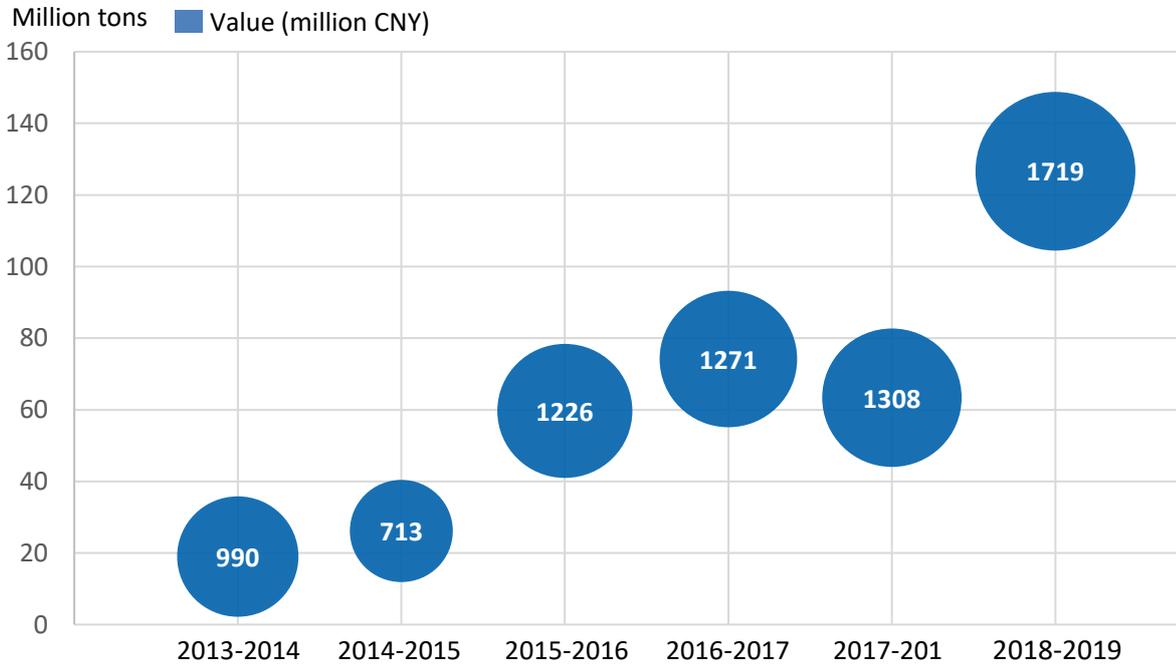


Figure 3 Trading volume and value of primary and secondary market in pilots (million tons/CNY).

Allowance prices stayed relatively stable during 2018-19

Beijing	The price in Beijing was above CNY 60/ton for most of the year.
Shanghai	The price stayed around CNY 30-40/ton.
Hubei	The price in Hubei has been steadily up since 2018 and is now stay around CNY 30-40/ton.
Shenzhen	The price stayed around CNY 20/ton. After the completion of compliance at the end of June 2018, the price experienced a brief decline and gradually recovered.
Guangdong	Guangdong has been stable around CNY 20/ton.
Fujian	Fujian's price was stable around CNY 20/ton in general. It experienced a brief decline before the 2018 compliance period and gradually recovered then.
Chongqing	The price fell sharply after reaching its peak in early 2018 and stabilized at CNY 5-10/ton since June 2019.
Tianjin	Tianjin's trading activity tends to be low and the price is between CNY 10-15/ton.

Table 1 Price trends in pilot markets during 2018/19, ranked in order of price at the close of trading on June 30, 2019.

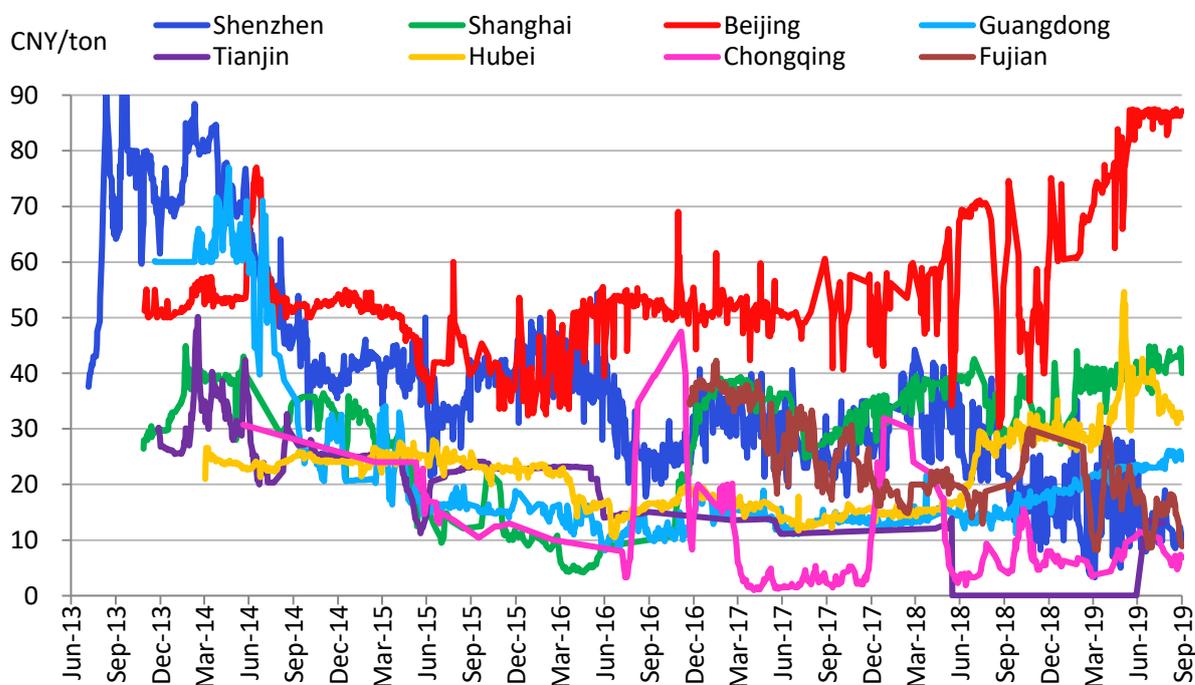


Figure 4 Daily average price of online trading (CNY/ton), 30 June, 2013 - 30 September, 2019.

CCERs

As of September 30, 2019, 287 CCER projects had been registered for emission reduction, and a cumulative 202 million tons CO₂ traded. In March 2017, NDRC announced the suspension all approvals related to CCERs due to the necessity of reviewing and revising current regulations. Therefore, the trading volume was extremely low in 2017-2018. In May 2018, as operation of the CCER trading platform resumed, CCER trading began to rebound. 3.7 billion tons were traded between July 2018 to April 2019.

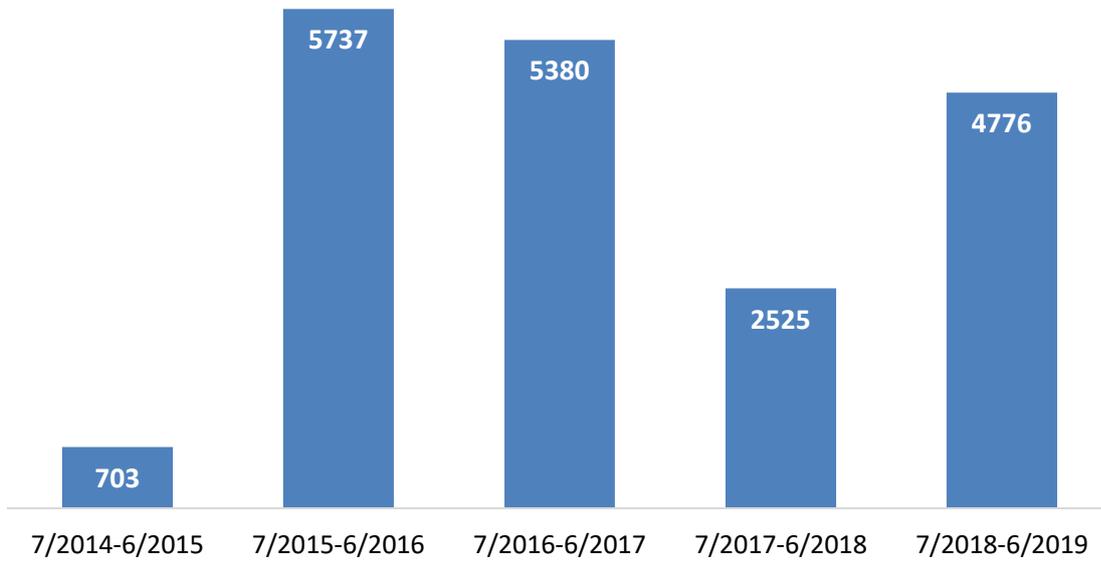


Figure 5 CCER trading volume (million tons).

Status of National ETS

The table below summarises the status of the national ETS development at present:

	Current status	Future trends
Policy	National ETS Development Plan released. Three phases of national ETS clarified: foundational work, simulation trading, deepening and expanding. Interim Administrative Measures on Emission Trading (Draft for Comment) released by MEE.	Detailed implementation plan of National ETS needs to be clarified further. Interim Administrative Measures on Emission Trading and the supporting administrative rules needs to be released.
Coverage	Only power generation sector will be covered initially.	Other sectors inc. once conditions met: petrochemicals, chemicals, building materials, iron and steel, nonferrous metals, papermaking, and aviation.
Allowance allocation	Trial Allocation Plan for National Power Sector ETS released; Draft allocation plans for cement and electrolytic aluminium have been formulated, and trial calculation conducted.	Release formal allowance allocation plan. Conduct allowance allocation according to the results of trial calculation.
Monitoring, reporting & verification (MRV)	MEE issued notification to start carbon emission monitoring plans, reporting and verification among 8 industrial sectors. Most provinces/cities have started the MRV work as required and are supposed to finish by end of May.	The authority of National ETS will work with relevant departments to formulate administrative measures on reporting and verifiers, improve guidelines and technical standards of GHG calculation and reporting.
Compliance	Interim Administrative Measures on Emission Trading (Draft for Comment) identifies responsibilities and penalties for emitters, verifiers and traders.	Specified legal responsibilities and compliance mechanism needs to be clarified further in the formal regulation.
Supporting systems	Plan for developing registry, trading, settlement and reporting systems has been confirmed. Plans for national registry system and trading system have been formulated; data collection is under development.	Registry will be located and managed in Hubei; Trading platform will be located and managed in Shanghai. After the plans of two systems confirmed, the development and implementation will be promoted.
Offsets	The administrative measures on CCERs are still under revision.	CCERs will be included in national ETS once conditions are met.
Transition plan of pilots	Power sector entities in regional markets to be incorporated into national ETS. Pilots continue to operate and will transition to national ETS once conditions are met.	The detailed transition plan is still being researched.

Table 2 Status of National ETS (at September 30, 2019).

Surveying China's carbon pricing stakeholders

The survey was conducted anonymously through a secure online survey platform, *Diaochapai*, from August 13 to November 2, 2019. Chinese language and English language versions were made available.

A number of channels were used to communicate with potential respondents. This included dissemination of the survey by industry associations to their members, namely the China Electricity Council, the China Cement Association and the China's Nonferrous Metals Industry Association. The survey was made accessible to participants of trainings held under the auspices of the EU-China ETS Platform, both at the trainings themselves, and through WeChat groups set up to support the trainings. The survey was also sent to participants in the 2018 survey who provided contact details. Finally, the survey was made available to potential respondents through targeted social media channels, in particular WeChat.⁷ 389 eligible responses are included in the analysis.

This survey is the fifth in a series. The 2013 survey was conducted before most of the pilot systems had begun operation in China, the 2015 survey provided a snapshot of the views after two years of pilot operation, the 2017 and 2018 surveys occurred in the periods before and after the release of the central government's plan for a national market. The number of respondents this year was the highest so far, compared with the 2018 survey (317), 2017 (260), 2015 (304) and 2013 (86).

The survey features strong representation from industry, as well as a significant number of responses from China's expert community on carbon markets, consultancies and academic expert advisors. It provides a reasonable indication of views and expectations among China's carbon market community.

Within this report, unless otherwise stated, percentages refer to the proportion of respondents to a particular question, excluding those who selected 'Don't know'.

⁷ Project partner SinoCarbon shared the survey with its WeChat channel, which at the time had over nine thousand subscribers. The project team sought responses from those with a known role working on carbon market issues for their organisations, or their known expertise on the subject matter.

Survey respondents by groups

Of the 389 respondents, 63% of respondents identified as being from industry, including 57% either already covered by an ETS likely to be covered by the national ETS in the future. This compares with covered entities representing 50% of the 2018 survey, 16% in 2017, 18% in 2015, and 7% in 2013. Of the covered entities, the highest representation was from power generation (42% of all respondents), followed by non-ferrous metals (4%), building materials (4%) and chemical (3%) sectors. 25% of covered or likely to be covered entities have participated in the regional pilot systems.

17% of respondents are representatives of companies which provide carbon market-related services, including consultancy, verification, offset development and trading. 4% of responses were received from local government (i.e. provincial or prefectural level). Academia and representatives of carbon exchanges provided a further 3% each overall. Other responses came from the carbon finance industry, research institutes, central government, NGOs and multilateral organisations.

Survey respondents by group

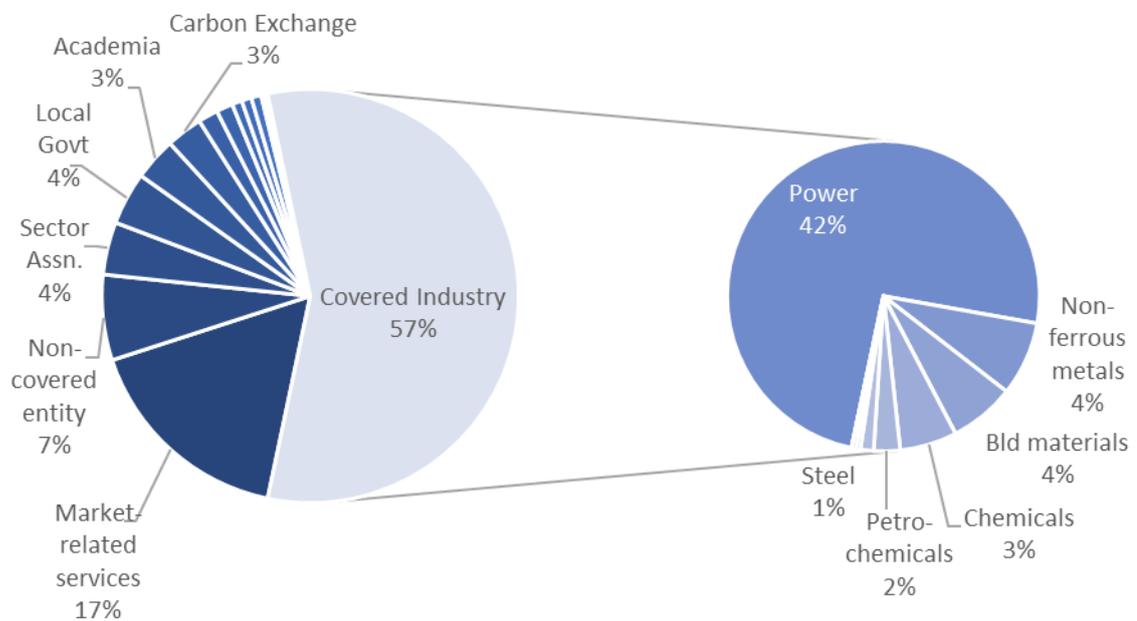


Figure 6 How would you classify your organization?
 Note: total number of responses n=389.

385 (99%) respondents used the Chinese version of the survey, and 2 (1%) respondents used the English version. The ratio of Chinese respondents increased with each iteration of the survey (51% in 2013, 92% in 2015, 94% in 2017 and 99% in 2018), showing that China's carbon market is increasingly a domestic effort.

Responses by region

19% of the respondents to the survey are from organisations located in Beijing. 32% were from provinces with pilot carbon markets, 67% from non-pilot regions, with the remaining 1% from organisations not based in mainland China.⁸

The relatively high level of responses from Beijing reflects the concentration of the policymaking, consultancy and expert communities in the capital city, and also because the project partners have stronger networks in Beijing. After Beijing, the highest number of respondents were from Shanxi (13%), Gansu (8%), Henan and Inner Mongolia (5% each).

The concentration of responses from Beijing has reduced since previous surveys (from 2015: 43%, 2017: 37%, 2018: 22%), reflecting a growing engagement in carbon markets across the country.

Survey respondents by region: increasingly widespread

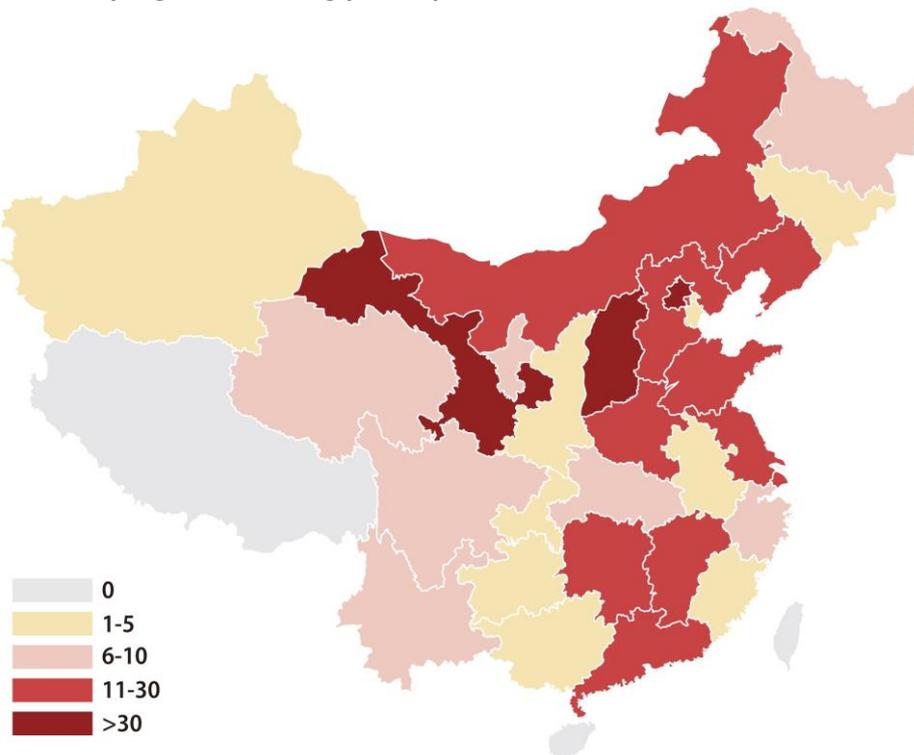


Figure 7 Location of respondent organisations (n=389)



Figure 8 Location of respondent organisations in previous survey: 2015, 2017, 2018.

⁸ The distribution of respondents in the 2017 China Carbon Pricing Survey was 22% from Beijing, 39% from pilot regions, 59% from non-pilot regions and 2% from outside of mainland China.

Industry responses

In total, 244 responses from industry were collected (including 218 from covered or likely to be covered entities). The distribution of the survey by industry associations to their members, in particular the China Electricity Council, helped to elicit a high number of responses from the power generation sector (164 covered entities). An additional 4% of overall responses came from industry associations themselves. The remaining 54 covered industry and most of the 26 non-covered entity responses were received through engagement at ETS trainings and through the networks of the project partners.

180 of the industry responses represented companies that expect to be covered by China's national ETS. In addition, 55 indicated that their company was already covered by a regional ETS, including participants in each of China's pilot ETS regions, with especially good representation from companies operating under the Beijing system (28), Shanghai (15) and Hubei (15).

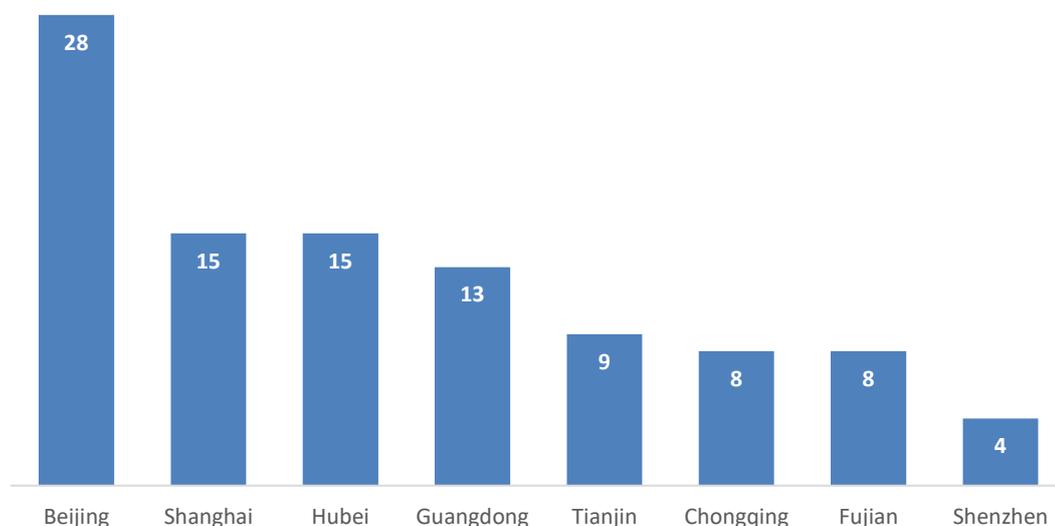


Figure 9 Is your company currently operating under an emissions trading system in China? If Yes: Which of the following? (n=55)

7 industry respondents were from companies currently operating in an ETS outside of China. Each of these responses came from companies that were operating under the EU ETS, while two were also participating in the California carbon market, and one in the New Zealand carbon market. For these companies, working under more than one ETS jurisdiction may facilitate experience sharing, industry peer to peer learning, and eventual integration across systems.

For respondents from covered or likely to be covered enterprises, almost two thirds identified as general staff (up from half last year), while 31% of responses were from mid-level managers. There were very few responses from senior executives, down from 29% last year.

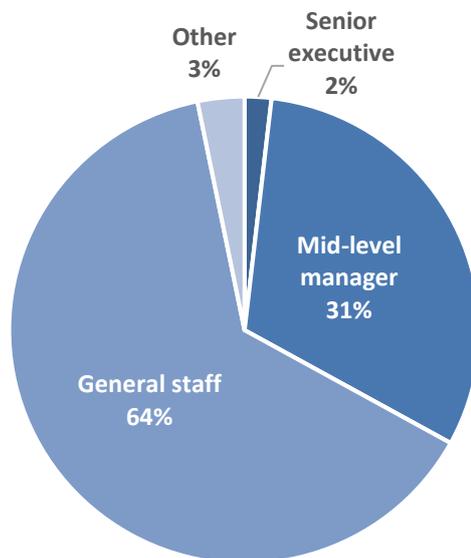


Figure 10 In the management structure of your company, what position do you hold? (n=218)

Of the responses from covered companies, 70% identified themselves as belonging to central state-owned companies, with another 13% from local state-owned enterprises. 11% of respondents from covered entities were from privately owned companies. 46% of the covered entities were very large energy consumers, reporting energy consumption of over 1 million tce/year, and 41% reported consumption of between 10 thousand to 1 million tce/year. 13% came from small companies with emissions of under 10,000 tce/year, which is expected to be the threshold for inclusion in the national carbon market, and most of these are already covered by the regional pilots. Very large emitters are dominated by state-owned enterprises, both central (80) and local (12). Central government SOEs are among the largest emitters in China.

Industry respondents by size and ownership type

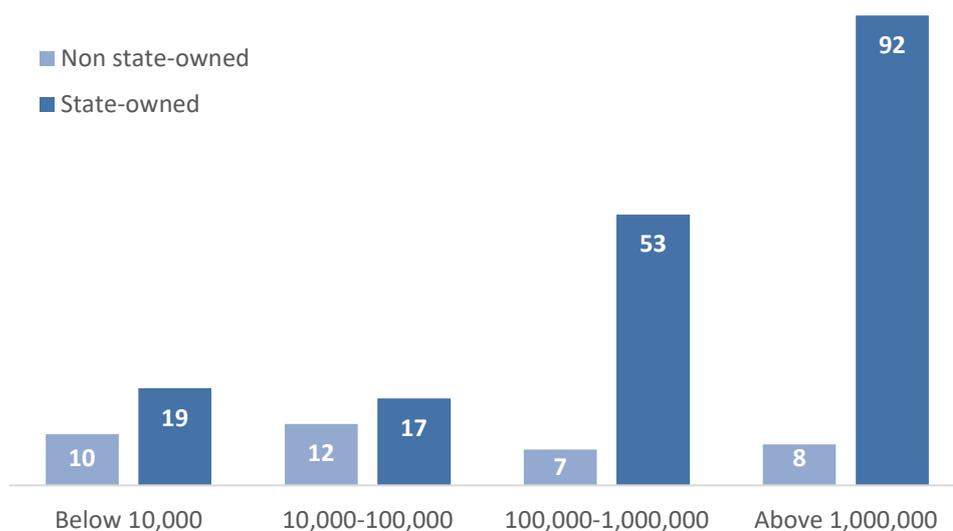


Figure 11 How much energy does your company annually consume in China? – by enterprise type (tce/year) (n=218)

The pilot emissions trading systems

Since the pilot carbon markets were launched in 2013 and 2014, they have each now completed either five or six compliance cycles, providing useful information to inform future policy making.

Prices in the pilot systems

Prices in the eight regional systems are outlined in Figure 4 on page 7 above. Around the time of the survey, prices ranged from CNY 5/t in Shenzhen to CNY 88/t in Beijing. Most respondents who expressed a view, said that carbon prices in the pilots at the time of the survey were either similar to or lower than what they expected (just over 40% for each). Below this overall number, however, there is a significant divergence in views between covered industry and other respondents. Over one third of covered industry say that prices are higher than they had expected.

Prices in the ETS pilots were lower than most stakeholders expected

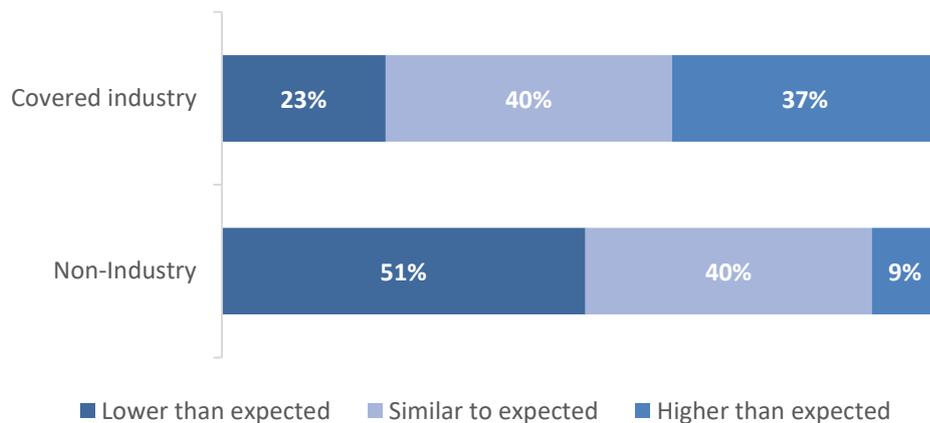


Figure 12 How do the current prices in ETS pilots compare with your expectations? (n=101)

Respondents were asked about their future expectations for prices in the pilot markets, both for the highest and lowest prices in the pilot regions, providing a range of expected prices for the years ahead. 87 respondents provided their expectations on pilot market prices, representing a response rate of 22%.

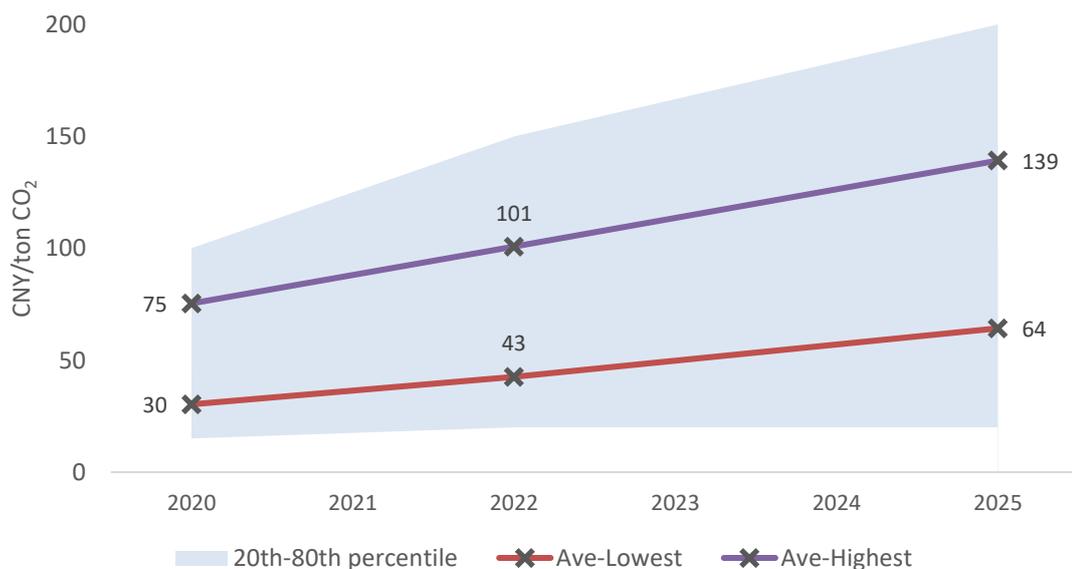


Figure 13 What do you expect the highest and lowest prices in the pilot regions to be in the coming years? (n=87,84,84)

Selected quotes on prices in the pilot regions to be in the coming years:

- First, carbon intensity of the economy has been decreasing year by year, and free quota allocation to enterprises has also been decreasing. Second, over the long term, the probability of pilot regions increasing paid allocation will increase significantly. Third, the overall economic growth will slow, leading to lower energy efficiency and an increase in the actual carbon intensity of enterprises. – *Shenzhen carbon exchange*
- Government will gradually tighten the market – *Beijing-based power company*
- With the tightening of quota allocation and the increase of emissions intensity caused by reduced load factors, future demand will increase and prices will rise. – *Beijing market services company*
- The carbon price should not be too high at the early stage. Rather, the priority should be given to getting the carbon market established. – *Hubei power company*

Factors influencing prices

When asked what the main factors are influencing prices in the ETS pilots, a large majority of those who expressed an opinion (88%) identified ‘cap setting and free allocation’ and ‘government regulation and intervention’ (80%) as the major factors. These two factors were also the most selected options in 2018, however they were selected by a significantly higher share of respondents in 2019. Uncertainty affecting demand was also selected at a higher rate than last year (39% vs 24%). Respondents were allowed to select multiple options.

Factors influencing prices by respondent group

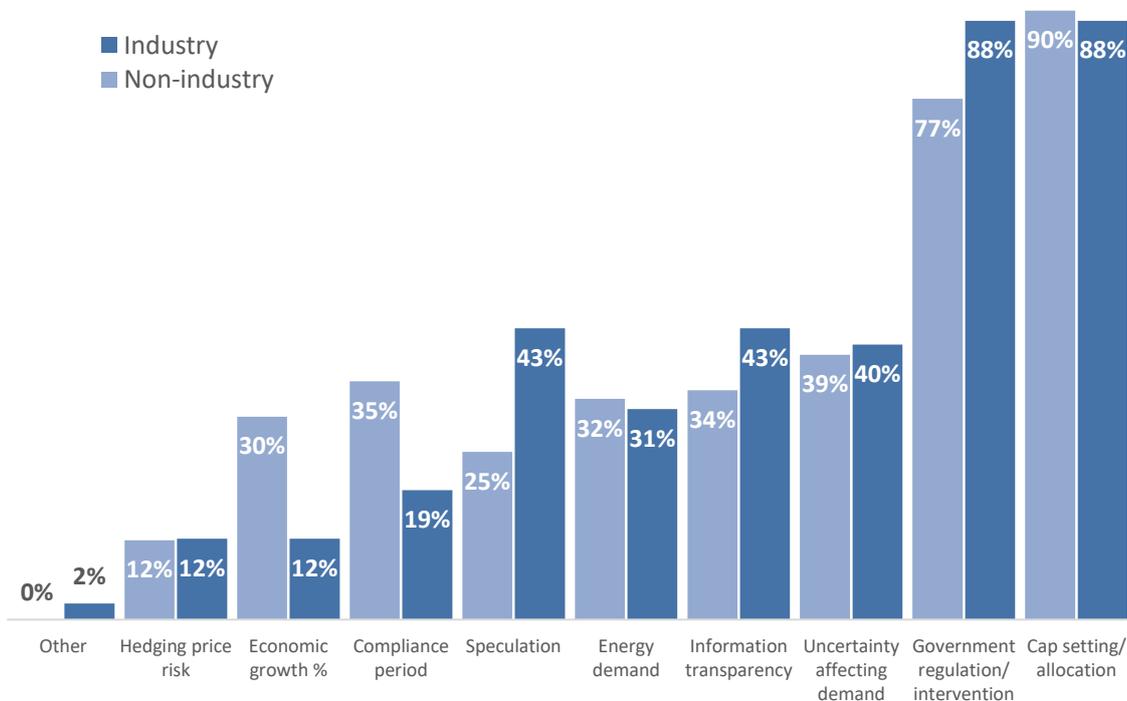


Figure 14 Q3-2 In your opinion, what are the main factors influencing prices in the ETS pilots? (n=119)

National emissions trading system

Since President Xi’s announcement ahead of the Paris Climate Summit in 2015, preparations have taken place for the development of a national emissions trading system. The national ETS could become a key component of China’s ambition to control its growing carbon emissions.

Start of national ETS

When asked by when China’s national ETS will be ‘fully functional’, only 12% of respondents expect this to occur by 2020 or earlier (down from 19% in 2018 and 47% in 2017).⁹ This drop is likely to be at least partly due to the uncertainty surrounding the progress of the Work Plan for the national ETS. 70% of respondents expect a fully functional carbon market between 2021 and 2025. Only 1% of likely to be covered enterprises do not expect the carbon market to ever become ‘fully functional’, down from 11% last year.

The national ETS is expected to be fully functional by mid-decade

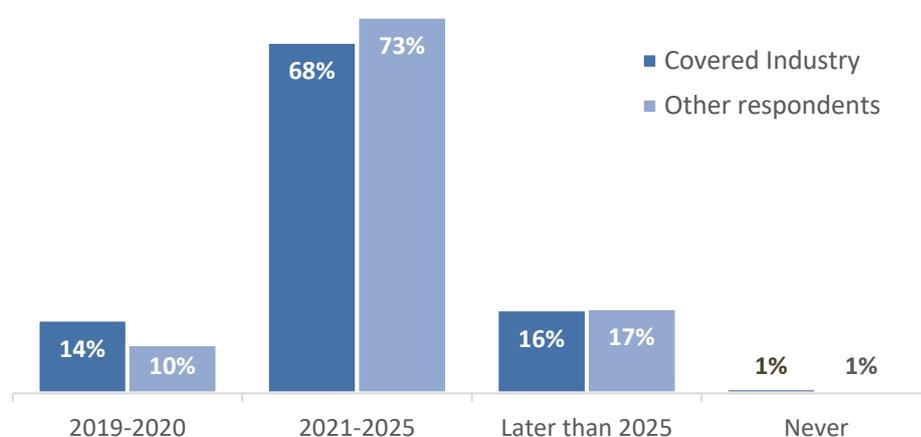


Figure 15 By when do you expect the China national ETS to be fully functional? (n=359)

Respondents were asked by when they think that the power sector will be ready for a compliance market (phase 3 of the ETS Development Plan). A majority of respondents expect that the power sector will be ready for trading in the compliance market by 2020, including 73% of power sector respondents.

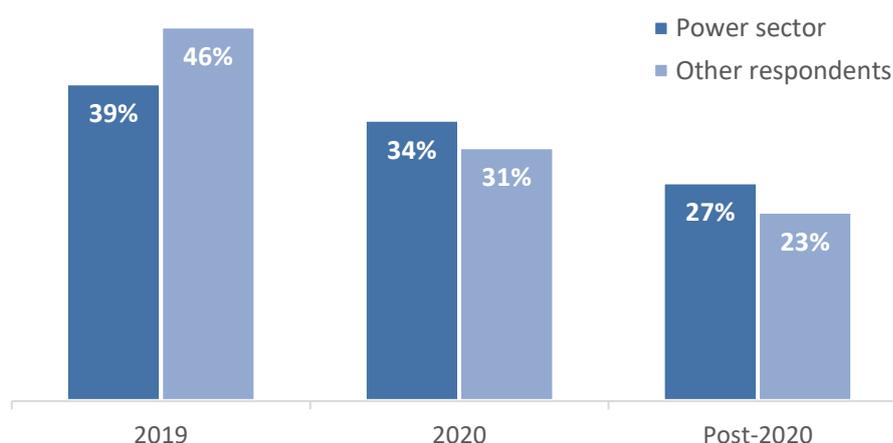


Figure 16 When do you think that the power sector will be ready for a compliance market?

⁹ Full text of question: “By when do you expect China national ETS to be fully functional? e.g. all key building blocks in place, including: legislation/law, cap and allocation management, complete MRVA system, registry, trading platforms, market oversight, etc.”

Power sector respondents were asked about their company's situation during the test phase of the national ETS regarding allowance allocation. The largest proportion of respondents suggested that allocation would be equal to their compliance needs (40%), while a third of respondents believe that they will have a surplus of allowances to sell.

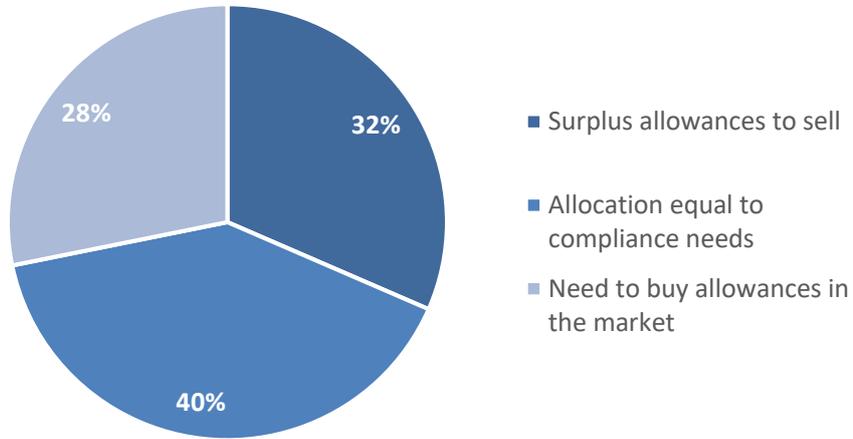


Figure 17 How do you expect your company's situation to be in the test phase of the national ETS regarding allowance allocation? (n=149)

When asked which sectors (if any) they expect to be ready to join the national ETS by 2022, the majority of respondents identified the cement and ferrous metals sectors, while other major emitters are expected to come later. 6% believe no other sectors will be ready to join by then.

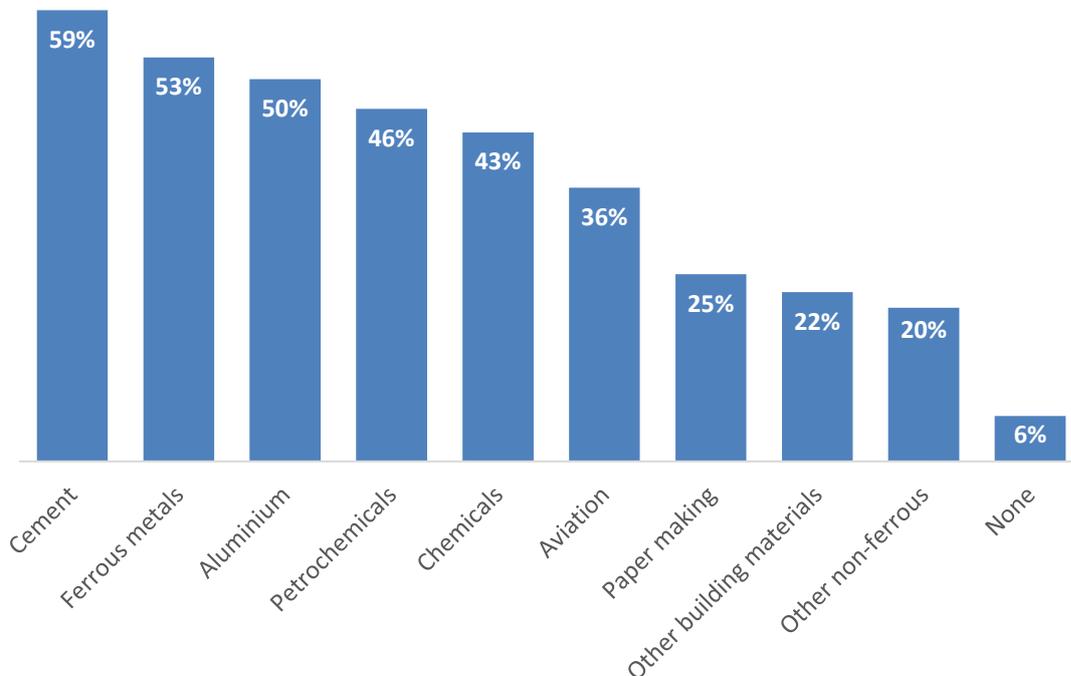


Figure 18 Do you think the following sectors will be ready to join the national system by the end of 2022? (n=389)

Management of the national ETS

Respondents were asked about the level of penalty or incentive structure would be strong enough to ensure a high percentage of compliance. While blacklist publication was identified as a useful approach by the majority of respondents, the most popular choice was a negative credit record for non-compliant companies, whereby companies' ability to secure finance from banks may be affected. This is consistent with the survey results from 2018.

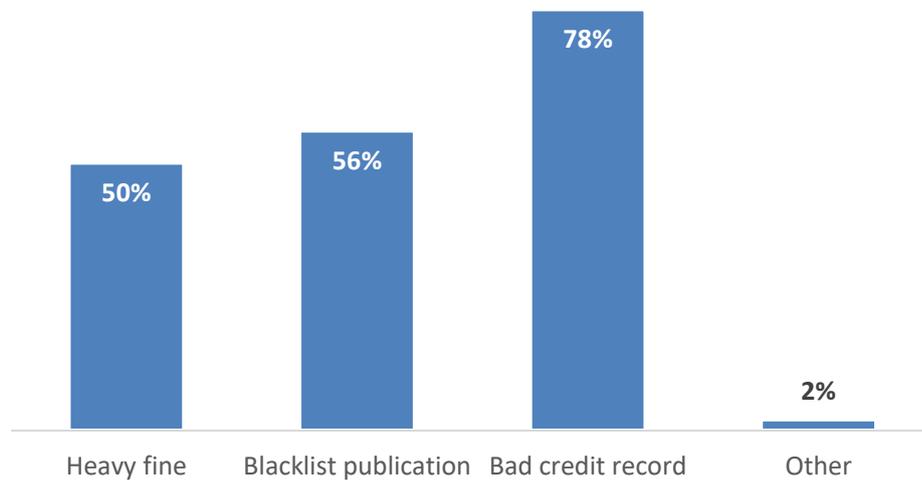


Figure 19 What level of penalty/incentive structure would be strong enough to ensure a high percentage of compliance? (n=389)

The majority of the respondents (70%) believe that some level of banking of permits from the pilot systems to the national ETS should be allowed.¹⁰ Respondents expect that companies will be able to transfer assets from the pilots into the national system without totally losing their value. 27% of respondents preferred no banking of pilot allowances, the same share as in 2018.

Some level of banking should be allowed from the pilots to the national ETS

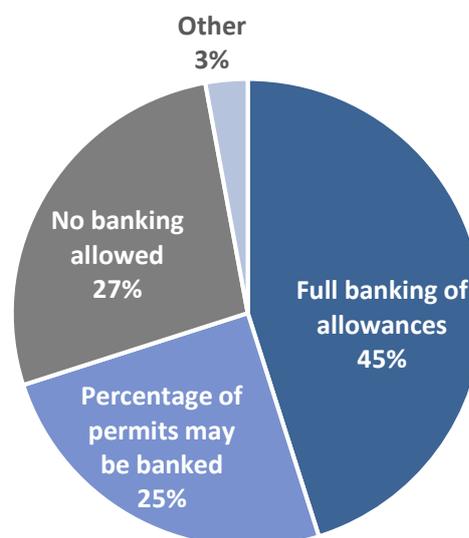


Figure 20 How should banking of permits from the pilot systems to the national ETS be managed? (n=277)

¹⁰ Banking means the holding of permits from one compliance period for the purpose of sale or surrender in a future compliance period.

How should banking of permits from the pilot systems to the national ETS be managed?

- Judging from the current situation, the pilot regions and the national carbon market will coexist for a period of time. During this period, if the pilot regions and the national carbon market authorities maintain a consistent approach to quota allocation and cap setting, they will avoid the problem of double-counting and different methodologies. In this case, allowances in the pilot markets can be carried over to the national carbon market; otherwise, the pilot areas and national authorities will need to strengthen coordination. – *Jiangsu academic*
- If all allowances can be carried over, the volume of national allowances will be too large, which may have a large impact on the national price and not be conducive to stable prices. If carryover is not allowed, however, it will result in the loss of pilot allowances, which is not conducive to a smooth transition from the pilots to the national carbon market. – *Ningxia power company*
- No carryover is required, as companies participating in the national carbon market establish separate accounts for that purpose. The original accounts applicable to the pilot regions will no longer add new allowances, and the stock can still be used for transactions in the original pilot regions, gradually being used up during the transition. – *Beijing-based power company*

Benchmarking and historical (grandfathering) allocation methodology are two widely-used methodologies for free allowance allocation in ETS. Benchmarking calculates allowance allocation to installations or entities compared to a benchmark value in one sector, which usually represents the lower end of GHG emissions in this sector and is determined by the authority based on reported GHG emissions data. Historical methodology calculates the allowance allocation in relation to an installation or entity’s own historical GHG emissions level in past years. The majority of industry respondents in the three sectors best represented in this year’s survey identified benchmarking as the most appropriate methodology for allocating allowances.

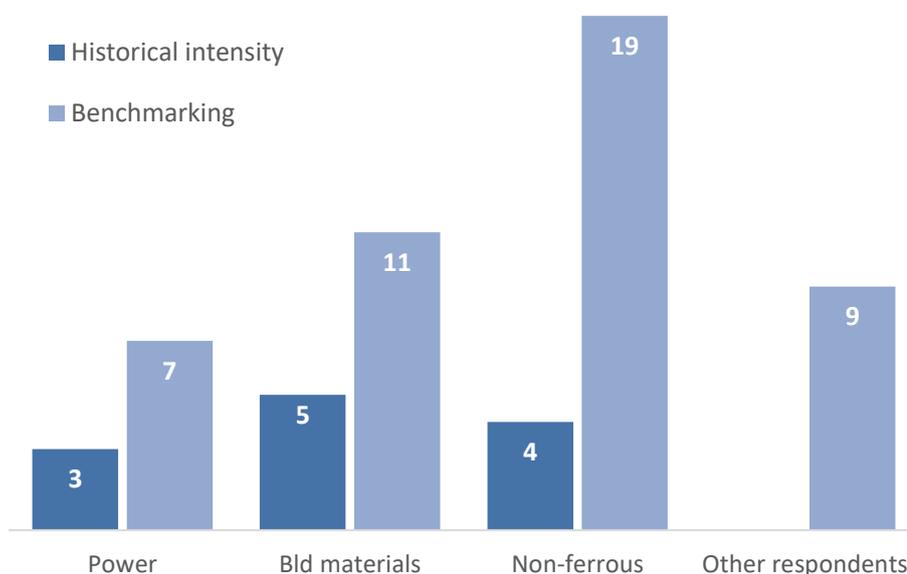


Figure 21 What do you think is the best method to allocate allowances? (n=63)

Almost half of those with a view expect that there will be auctioning covering at least 10% of the total cap by 2025.

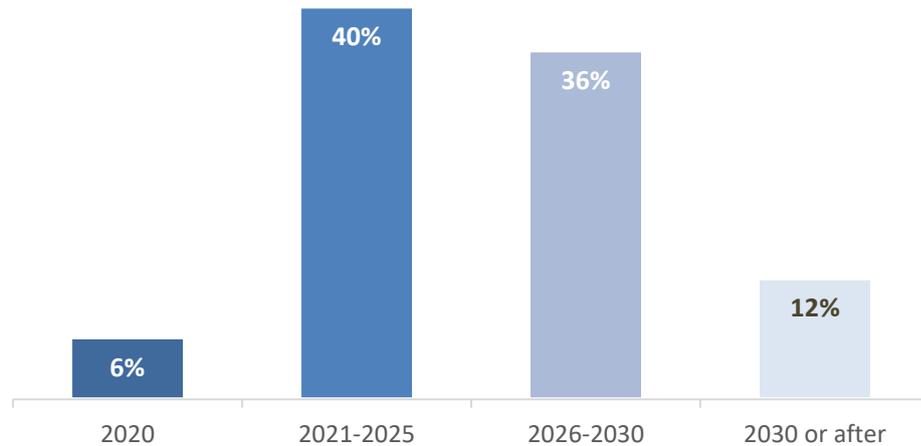


Figure 22 By when do you expect auctioning to cover at least 10% of the total cap? (n=331)

Over a third of respondents believe that publication of emissions data could be made mandatory as soon as possible, and over 80% think this could occur by 2025.

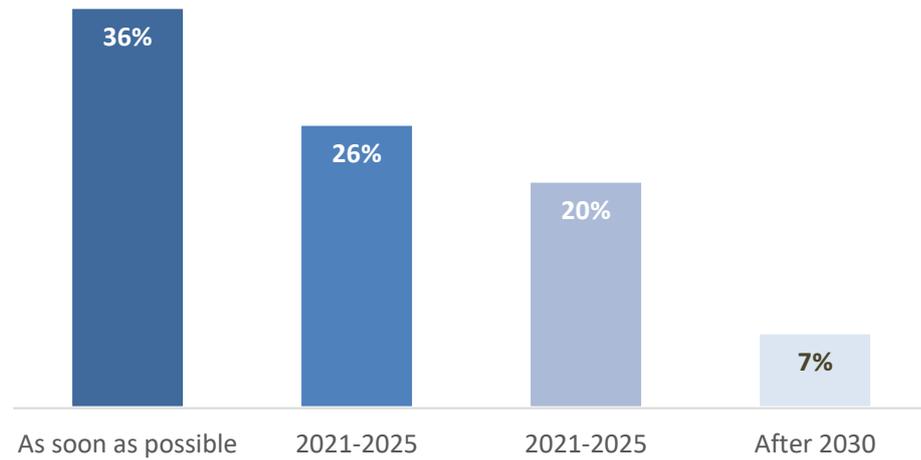


Figure 23 Do you think that publication of emissions data could be made mandatory by: (n=354)

Most respondents believe that non-covered entities should be able to participate in the national carbon market by 2025.

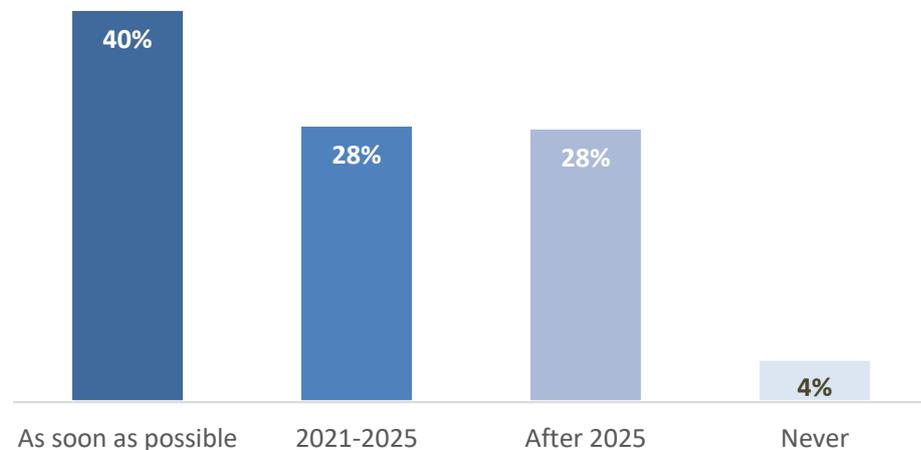


Figure 24 Do you think that non-covered entities should be able to participate in the national carbon market by: (n=342)

Prices in the national ETS

Respondents were asked what they expect the average carbon price to be at different points in time in a national ETS in China. The results indicate an expectation of steadily rising prices, but with significant variance over the levels.

The average price expectation in the national ETS starts at CNY 43/t in 2020, rises to CNY 116/t by the end of next decade, and to over CNY 180/t by the middle of the century. The price levels remain highly uncertain in the more distant future. The 20th and 80th percentiles for 2030 are CNY 30/t and CNY 150/t respectively. The future price expectations are lower than at the time of the 2018 survey. At that time, average expectations were CNY 54/t in 2020; CNY 98/t in 2025.

49% of respondents provided no price estimates (slightly higher than last year). High levels of uncertainty may lead some respondents to be reluctant to provide a quantified price expectation.

China's carbon price is expected to steadily rise

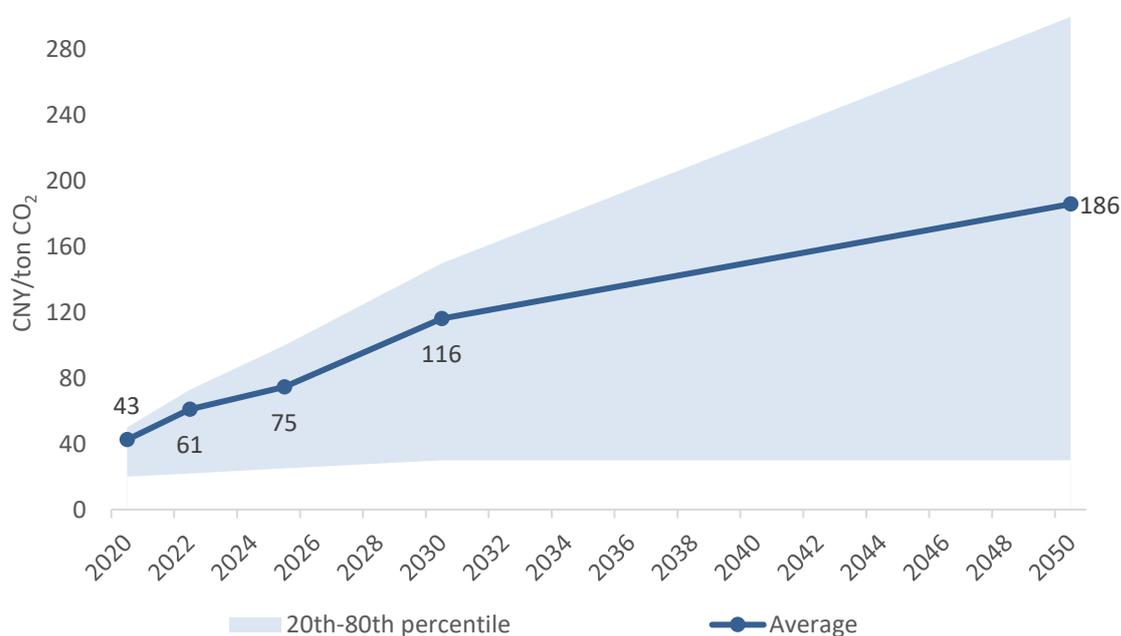


Figure 25 What do you expect the price in the national ETS to be in the coming years?
(n=199,192,186,183,178)¹¹

It is worth noting that the expected ETS price is not an accurate indicator of overall effort to reduce carbon emissions, because the ETS is complemented by non-pricing policies such as mandatory closure of inefficient facilities, incentives for energy saving, renewable energy feed-in tariffs, etc.

¹¹ For Q5-13, the authors removed one outlying response, with answers of CNY 5,000/t, 6,000/t, 6,000/t, 8,000/t, 8,000/t for the given years. These were considered to be extreme and therefore not included in the analysis.

Selected quotes on the price of carbon in the national ETS in coming years:

- The control of emission quotas in the early stage must be relatively loose. The cost should be spread equally among power generation companies, and should be small. With the development of the thermal power industry, control can become stricter, and quotas gradually approach marginal profits. – *Shandong power company*
- Before reaching its peak, total emissions will rise. Society needs to increase energy supply. To support energy security, carbon prices should be low in order to maintain the corporate incentive for production. After reaching the peak, the carbon price can go higher. – *Beijing-based power company*
- More and more industries will be included, and individuals will also be able to participate in carbon trading. The key processes are being improved upon. High carbon prices are conducive to reducing emissions, but at the same time the factor of inflation needs to be considered. – *Xinjiang market services company*
- In a few years, when the masses feel hot, the government will introduce a "war to defend a cool environment", so the allowance price will naturally rise. – *Shanxi power company*
- The demand gap is growing as supply is decreasing, and prices are rising. High prices can stimulate companies to reduce emissions – *Beijing market services company*
- The power industry is currently generally losing money and cannot afford higher carbon prices. – *Henan power company*

Readiness for emissions trading

Respondents from both covered industry and local government were asked how prepared their organisation is to take part in an ETS. Of the 218 respondents from covered industry, carbon finance (91%) and allowance and CCER trading (74%) were outlined as the areas in which organisations were least prepared. This result is similar to that in the 2018 survey.

Among respondents, there was a reasonable level of preparedness for monitoring and reporting (79%) and for allocation data collection (63%). The most significant change in result from last year's survey is the share of industry representatives who reported having already established 'carbon management procedures', which was up to 55% from 48%.

The results from this year's survey show that only 3% of industry respondents are not prepared at all for 'monitoring and reporting emissions', an improvement from last year; 8% of respondents are not prepared for 'allocation data collection', up from 3%; 24% of respondents are not prepared for 'allowance and CCER trading', down from 39%; 41% of respondents are not prepared for 'carbon finance', down from 54%.

We also compared the responses of companies which participated in regional pilot carbon markets, versus those who didn't. As should be expected, there survey shows a significantly higher level of preparedness amongst companies that have participated in regional pilot carbon markets.

Pilot Entities

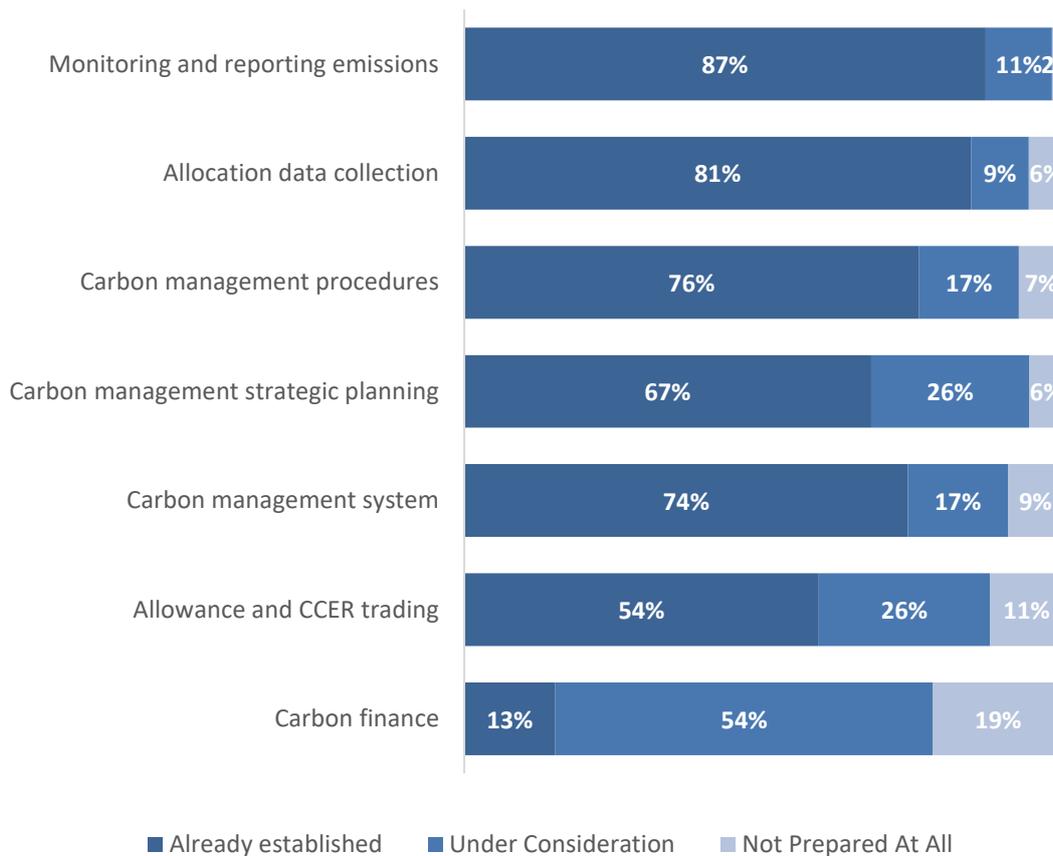


Figure 26 How prepared is your company to perform tasks under an ETS? – Pilot entities (n=54,52,53,54,54,49,46)

Non-pilot Entities

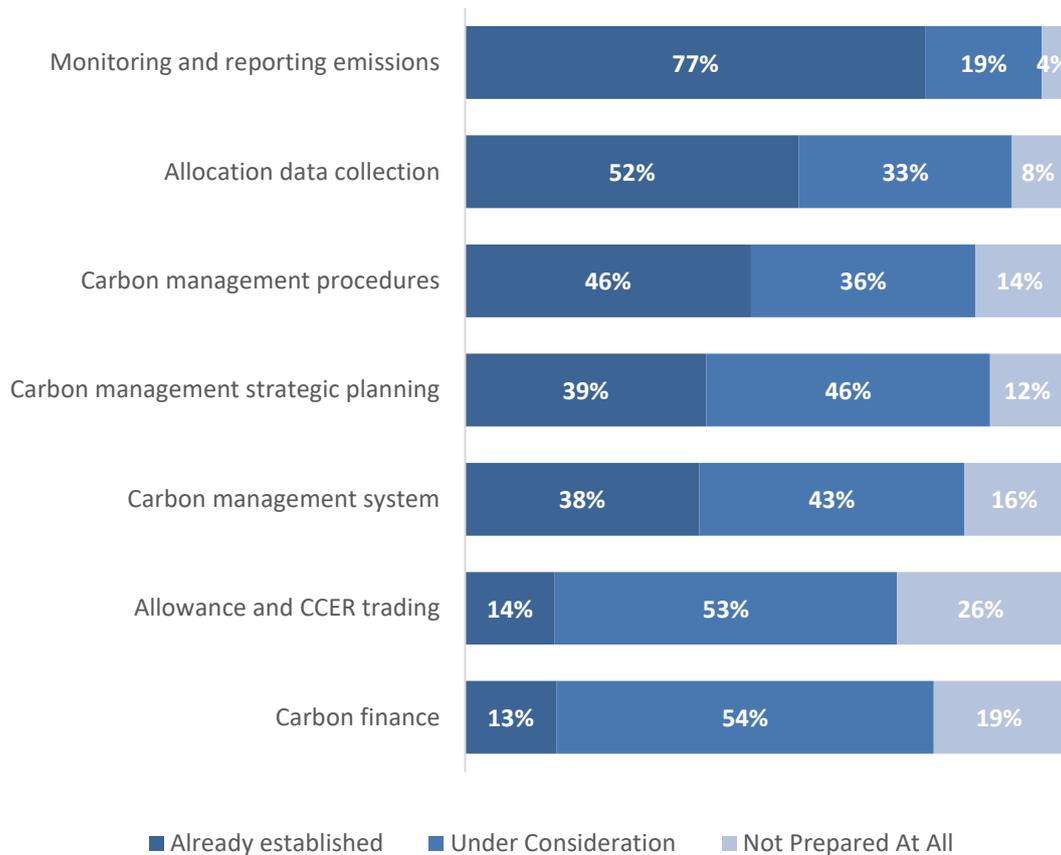


Figure 27 How prepared is your company to perform tasks under an ETS? – Non-pilot entities (n=160,149,154,155,156,147,137)

Following on from this, respondents were asked to identify in which areas they needed to receive further training before the national ETS starts, allowing multiple selections. Needs for further capacity building are broad and diverse. The most frequently chosen priority areas include: ‘key features of ETS’ and ‘corporate compliance strategy’.

31% of respondents claimed a need for training in monitoring and reporting. This suggests that there is significant need for additional training even in companies’ core duties in the ETS.

Half of the respondents from local government also identified ‘key features of ETS’ as an area where they needed further training.

Capacity building is needed in many aspects

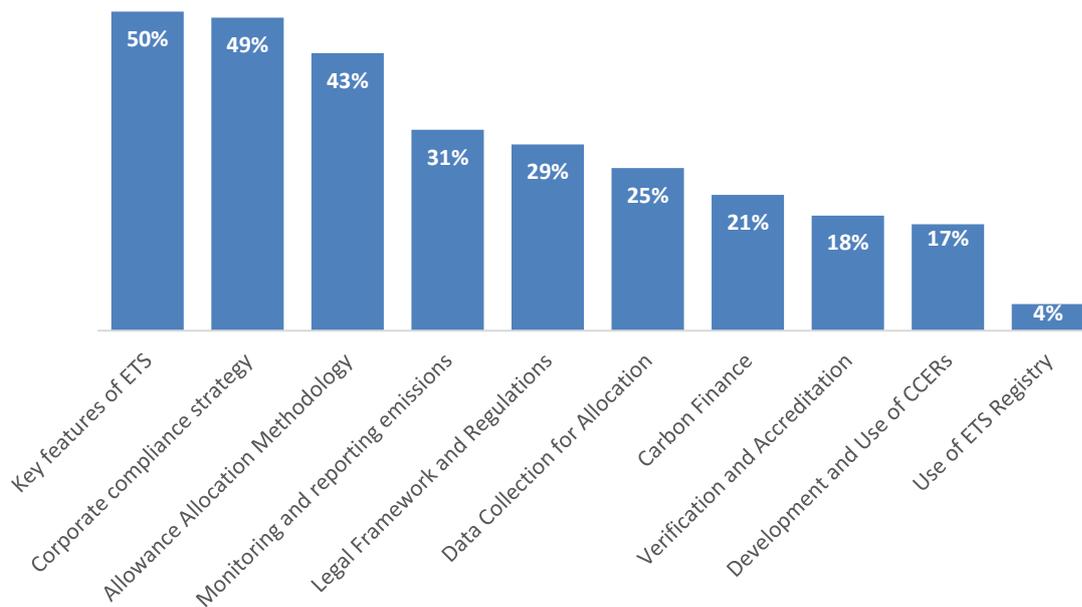


Figure 28 In which areas do you need to receive further training before the national ETS starts? (Select up to 3) (n=159)

For the areas where your company is fully prepared, what are the key factors that have helped you achieve this readiness?

- The leaders of the enterprise attach great importance to moving forward in an orderly way, in accordance with the policy guidance of the Ministry of Ecology and Environment, and through exchanges with the China Electricity Council and other industry participants. – *Beijing-based power company*
- Regular group training and guidance in the company, as well as training and guidance for individual employees. – *Yunnan power company*
- Suggest to accelerate the integration of other industries in to the carbon market system. – *Inner Mongolia power company*

Are there specific issues which have prevented your company from developing sufficient capacity to-date?

- Carbon emissions trading is a pilot project. There is no clear industry standard and system for carbon emissions data measurement, verification, monitoring, and allowance allocation methodology. At present, the company's carbon emissions work is only monitoring and verification, and simulated trading of carbon assets. But how companies in the relevant industries should deal with the passive market environment is not clear. And corporate leaders are now only responding to carbon emission inspections, and there is no clear understanding and emphasis on carbon assets. – *Shandong power company*
- Because there are no substantial carbon emissions compliance requirements and transactions, the company is not too concerned about carbon emissions – *Jiangsu power company*
- The carbon market has little relevant information. Its impact on companies is not clear and the initiative from management is weak. – *Shandong aluminium company*
- It is our first time dealing with this thing, and little is known about it. – *Hebei government official*

The covered industry respondents were asked whether they had formulated a dedicated team to handle ETS obligations. 50% of respondents had dedicated either an individual or a team (up from 42% last year).

Half of companies have formed a team to handle ETS obligations

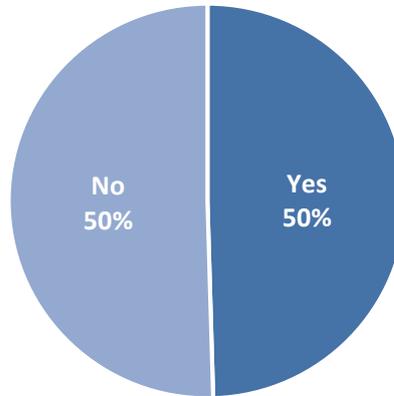


Figure 29 Has your company assigned a dedicated person (internal or external) or formed a dedicated team to handle your ETS obligations? (n=218)

Of these companies which have formed teams, most were comprised of either decision-making teams from different departments (25%) or had a dedicated department (58%). Only 17% of respondents had outsourced to an independent company.

Companies have different approaches to ensuring compliance with ETS obligations

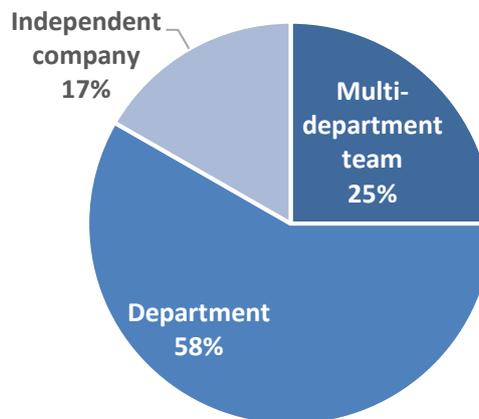


Figure 30 What is your team’s organizational form? (n=108)

Teams ranged in size of up to 50 persons, with the average team consisting of 5 people. Companies that participate in pilot markets have teams that average 7.2 people, while companies which didn’t participate in the pilot markets average 3.5 people per team. The numbers vary significantly between industries, which is understandable given the extensive experience that the power sector has had in engaging with carbon markets, including the previous CDM. Companies in some of the sectors to be covered later in the national ETS indicate that they assign people part-time to take responsibility for carbon emission management.

These results do not suggest that companies with small teams are understaffed. Even large compliance firms can manage with teams of five or less dedicated professional staff for MRV and allocation purposes.

Local government respondents were also asked about the size of their ETS teams, Those that had established teams, the largest consisted of 8 people, and two thirds had 1.

Most companies have small teams to deal with ETS obligations

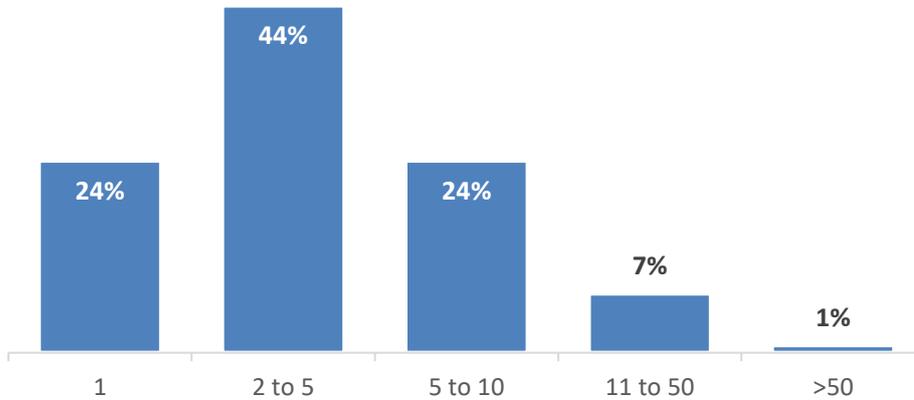


Figure 31 How many people are in the team? – Industry respondents (n=108)

Most local governments have 1 person in the team

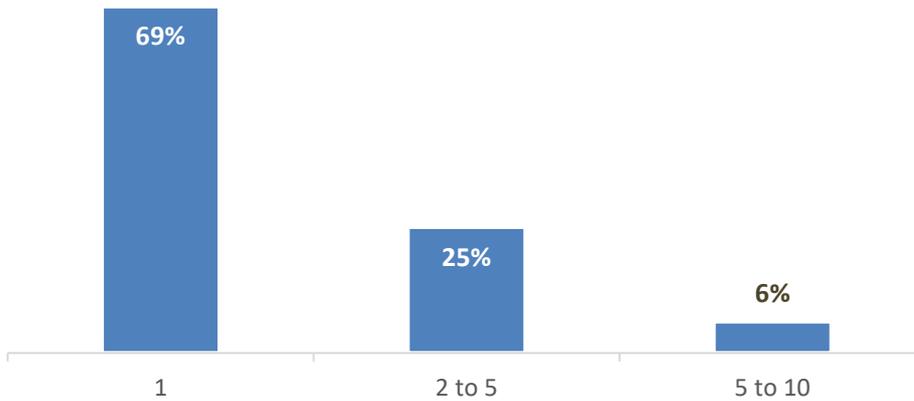


Figure 32 How many people are in the team? – Government respondents (n=14)

This year’s survey shows an increase in involvement of management staff in teams, 58% (up from 46% in 2019). This should be regarded as a positive feature, probably adding to the visibility and ‘profile’ of ETS compliance functions in a firm.

ETS compliance teams include environment, energy saving and management staff

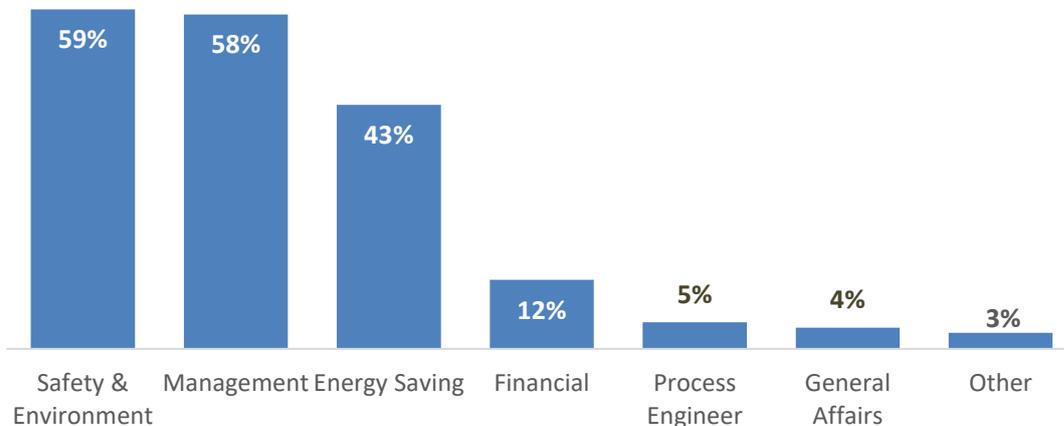


Figure 33 What are the competencies of the person(s) you have assigned to handle the ETS obligations? (n=108)

About two thirds of both covered industry and local government respondents had participated in trainings on ETS, compared to 58% in last year’s survey. Capacity building cooperation through bilateral projects and NGOs have contributed to this.

A large majority of industry and local authorities have participated in ETS training



Figure 34 Has your company participated in training(s) on ETS?
 Left: industry respondents (n=218); Right: Government respondents (n=16)

28% of respondents from covered or likely to be covered companies responded that their company had developed a compliance strategy for ETS in China. ‘Preparing to buy allowances’ was the most frequently selected approach, whereas last year it was ‘energy efficiency measures’.

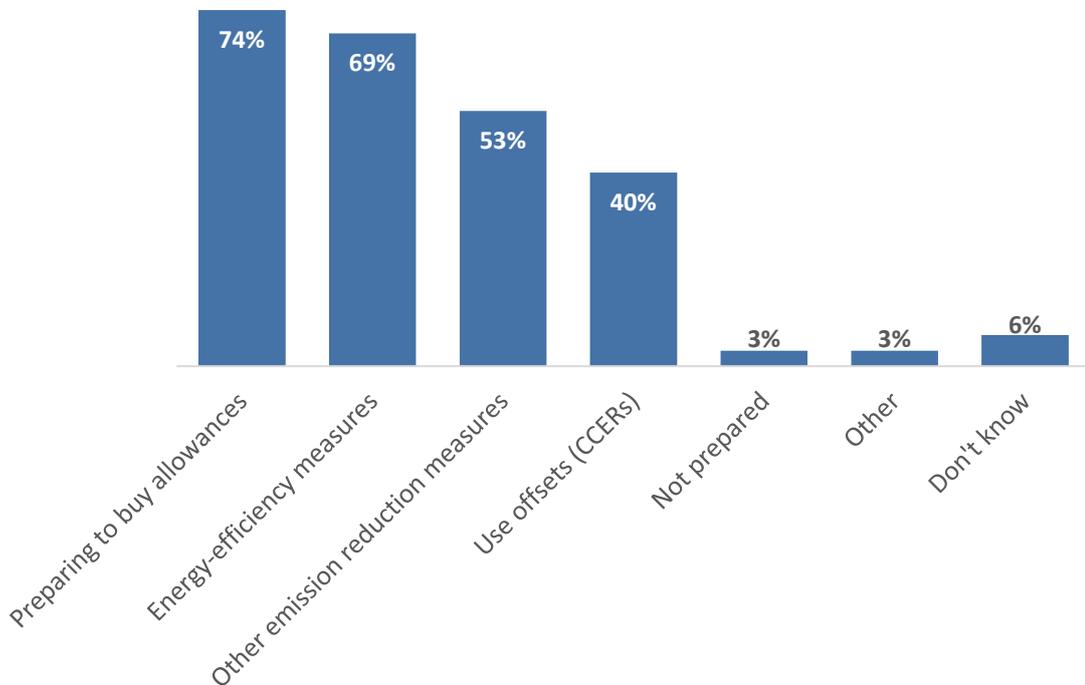


Figure 35 Has your company formulated a compliance strategy for ETS in China? If Yes: How do you plan to be in compliance? (n=62)

The majority of participants in the pilot markets (61%) believe that the transition from pilot to national ETS will require some adjustment to their strategy and/or organizational structure. This was down markedly from last year (91%).

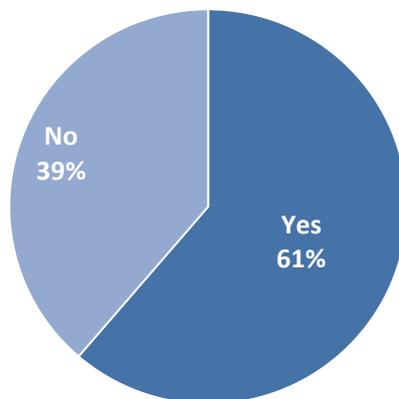


Figure 36 Does the transition from pilot to national ETS require some adjustment to your strategy and/or organizational structure?

Selected quotes on how the transition from pilot to national ETS requires some adjustments to strategy and/or organizational structure?

- Specialized positions required to manage carbon asset trading – *Chongqing power company*
- From decentralized management to centralized management – *Beijing-based power company*

Of the covered companies, 56% state that their company has set an internal emission reduction target, down from 72% last year and similar to results in 2015 and 2017. The authors believe that the overall average in this year's survey is brought down from last year somewhat by the much higher coverage of the power sector in non-pilot regions such as Shanxi and Gansu.

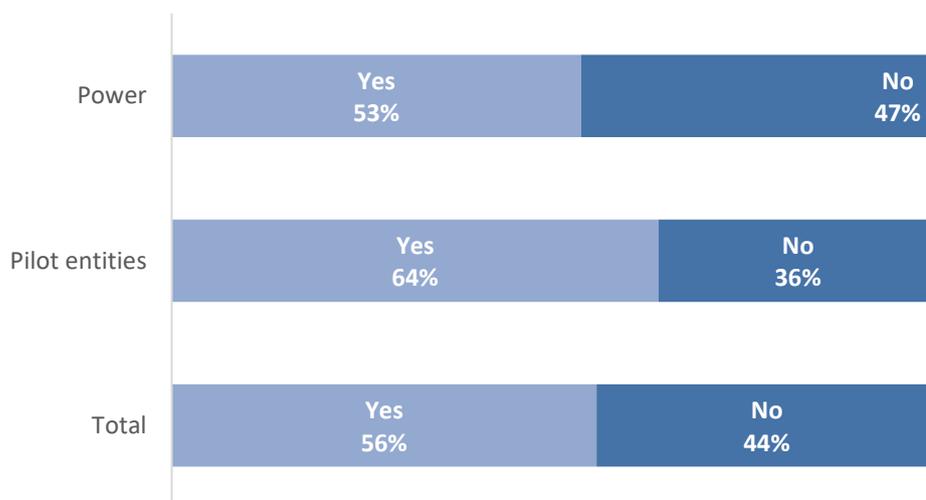


Figure 37 Does your company have an emissions reduction target?

Only 9% of respondents have implemented an internal/shadow carbon price. Internal prices averaged CNY 36/ton, close to the average of current spot prices in China's regional carbon markets.

What other preparations are needed in order to be ready for participation in the ETS?

- Strengthen contact with the group's carbon asset company, and keep abreast of the national carbon emission trading policy and the specific regulations and implementation rules of the province's carbon allowance issuance and compliance. – *Shanxi power company*
- Only staff training and simulated trading. The company's leadership level does not know enough about carbon assets – *Shandong power company*
- The carbon price is not easy to be too high, it is not appropriate to disclose corporate carbon emission data, and it is recommended that other industries be included in the carbon market as soon as possible. – *Gansu power company*
- Conduct financial, trading and risk control training, establish a trading decision-making mechanism, establish a risk control system, and establish a performance appraisal mechanism. – *Beijing power and chemicals company*
- Clarify the responsibilities of leaders, allocate full-time personnel, and conduct training according to the responsibilities of personnel at all levels. – *Shandong power company*

Impacts of carbon pricing on investment

Respondents were asked if they expected the price of carbon to affect investment decisions in 2020, 2025, 2030 and 2050. Respondents expect carbon pricing to increasingly affect investment decisions in the coming years. In 2020, 47% of those who expressed a view, expect investment decisions to be strongly or moderately affected. By 2025, this number rises to 68% of respondents. Only 4% of respondents who answered this question expect investment decisions to be unaffected by 2025 (down from 13% last year).

Carbon emissions trading is expected to increasingly affect investment decisions

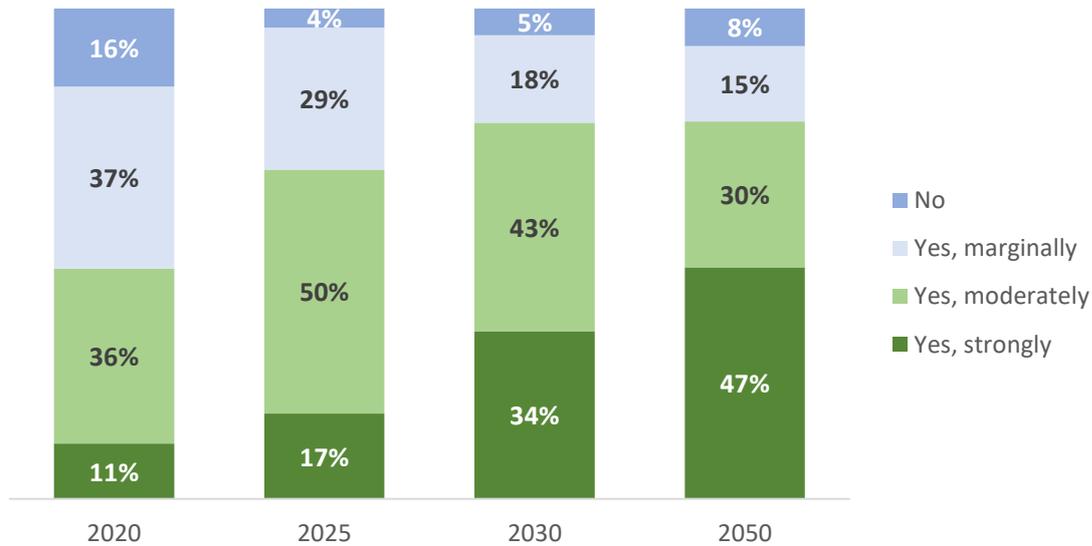


Figure 38 Do you expect the ETS in China to affect investment decisions in 2020, 2025, 2030, 2050? (n=362,360,346,324)

Unlike in most other jurisdictions with carbon pricing, China's electricity prices are currently fixed on an annual basis by the central government, with variations by region. This means that power generation companies cannot pass the carbon price on to consumers. Survey respondents were asked by what time they expect the national ETS to affect the price of electricity for consumers.

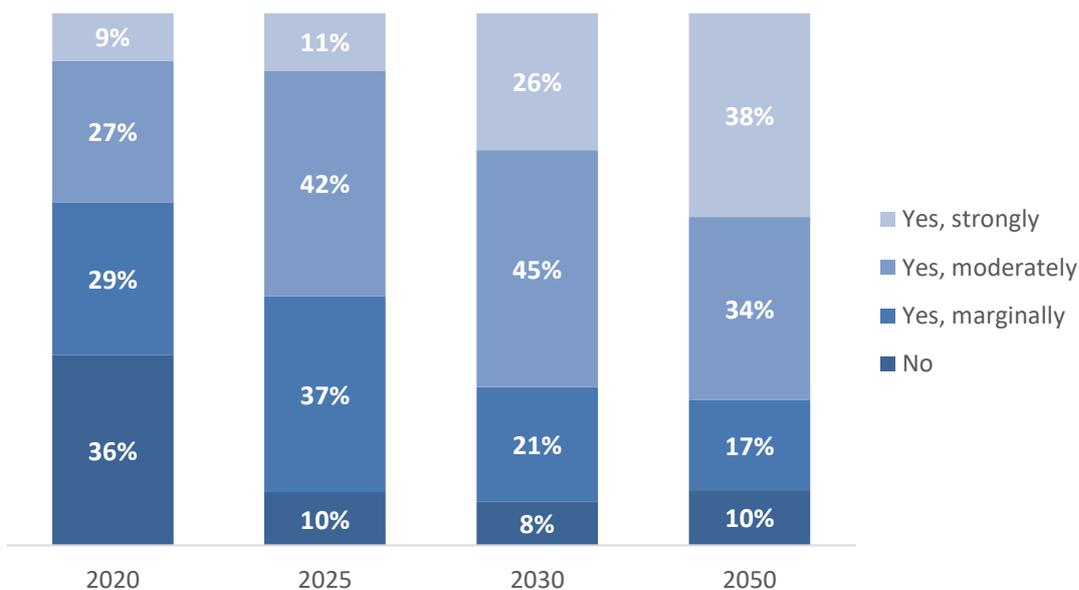


Figure 39 Do you expect the carbon price to affect the price of electricity in 2020; 2025; 2030; 2050? (n=371,363,352,337)

Do you expect the ETS to affect investment decisions? Why?

- A carbon price of less than 100 RMB will have little effect. Carbon prices above 200 will exert a greater impact. – *Guangdong petrochemicals company*
- The impact of the carbon market on China's high energy-consuming industries is directly related to the strictness of the total target setting. With the strengthening of emission reduction targets and the improvement of market mechanisms, it is believed that the carbon market will play an increasingly clear impact on technology investment. – *Jiangsu academic*
- With the gradual improvement of national policies and the increasingly high requirements for energy conservation, the company's equipment will gradually face large-scale technological changes, or even replacement. – *Shanxi power company*
- The small demand gap and low price at this stage will not have a large impact on decision-making. Increasing this gap in later periods together with higher prices will have a greater impact on decision-making. – *Beijing market services company*
- I'm not sure if thermal power plants will still exist in 2050. – *Shanxi power company*

Do you expect the carbon price to affect the price of electricity? Why?

- Emissions should be borne by downstream companies – *Jiangsu power company*
- In the short term, if China's market-oriented reforms in the field of transmission and distribution move slowly, the carbon market will have a limited impact on electricity prices in relation to covered companies. Only through long-term market-oriented reform of the power sector will the effect become clear. – *Jiangsu academic*
- Carbon prices will undoubtedly be part of the changing cost of electricity prices. Like coal, it will directly affect electricity price trends. – *Inner Mongolia power company*
- Electricity is a public service. Only when the carbon price is reflected in the electricity price can the role of the carbon market be fully brought into play. – *Beijing-based power company*

Respondents from companies that have been covered by the regional pilot markets were asked how the pilot carbon markets had affected their company. A majority responded that the markets had had a positive impact.

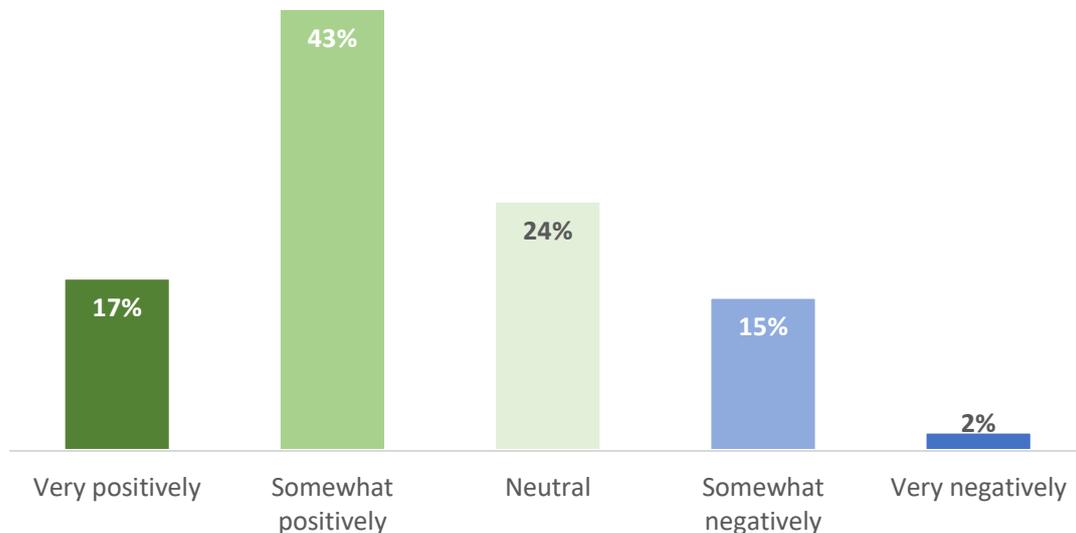


Figure 40 All considered, how have the pilot carbon markets affected your company? (n=54)

The same group were asked whether the carbon price made an investment profitable or helped the business case for an investment that reduces carbon emissions directly or indirectly. A large majority of pilot entities responded that this was the case.

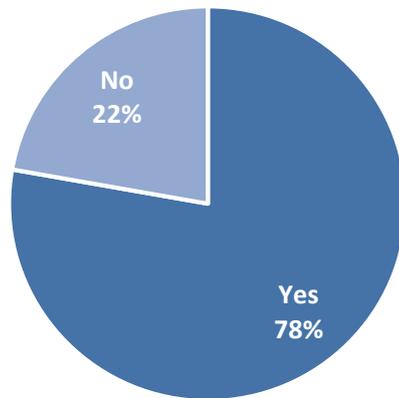


Figure 41 Following your company's participation in the pilot systems, has the carbon price made an investment profitable or helped the business case for an investment that reduces carbon emissions directly or indirectly? (n=45)

On the other hand, 10% of respondents from pilot entities said that that pilot systems had caused their company to move facilities from one region to another, as a result of the carbon price.

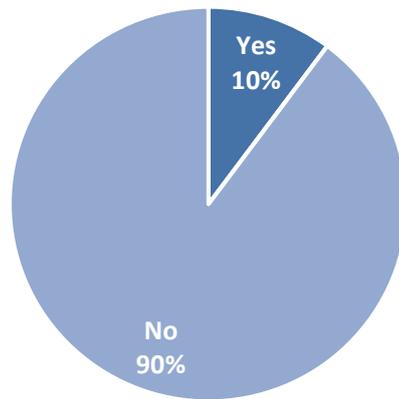


Figure 42 Following your company's participation in the pilot systems, did you move any facilities from one region to another, as a result of the carbon price? (n=49)

Carbon pricing in context

Respondents were asked what they expect will be the most important policies to reduce GHG emissions in China at different points in time. From now until 2025, the combined expectation of respondents is that the emphasis will clearly shift towards carbon emissions trading, environmental tax, environmental information disclosure and energy allowances trading.¹² This reflects a shift away from traditional approaches such as the mandatory closure of inefficient facilities, to be replaced by a suite of more market-oriented policies. At the same time, respondents still predict a situation where there is a mix of policies in the long run.

ETS is already seen as a motivator for GHG reduction in 2020, suggesting that the policy can have a positive impact even if the carbon price signal is not yet at a high level. At the same time, the share of respondents identifying emissions trading as one of the most important policies drops from 25% in 2020 to 21% in 2025. This may be due to an expectation of a more diverse environmental policy portfolio over coming years. For example, there continues to be keen interest amongst the environmental policy community in the potential benefits of a carbon tax. This could potentially involve CO₂ being integrated into the existing environmental tax regime which currently includes taxing of other air pollutants. Of the respondents who identified ETS as a motivating factor in 2020, but not in 2025, the largest number of respondents shifted their expectation to environmental tax. In addition, China's ministry-level economic agency, the National Development and Reform Commission, is actively piloting energy conservation allowance trading, leading to expectations that this will be an important policy for many of the same sectors covered by emissions trading.

Market-oriented policy instruments expected to become more important over time

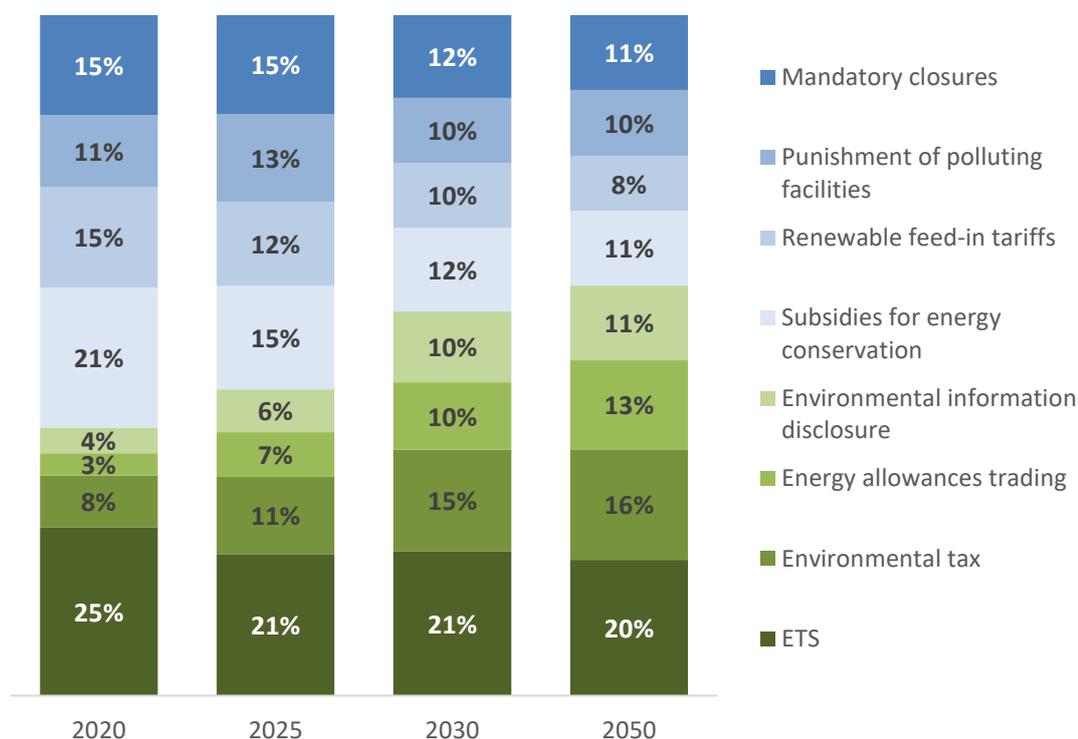


Figure 43 Which do you expect to be the most important policies in motivating companies to reduce GHG emissions in China at different points in time? (Select up to 3 for each year) (n=383)

¹² Energy allowances trading is a new policy introduced by the Chinese government, first in four pilot regions to be expanded nationally if successful. It will allocate energy-consumption quotas to companies, who will have to eliminate outdated capacity or buy extra quotas if they exceed the limit.

Peak emissions

China committed to peak its absolute greenhouse gas emissions by 2030 or earlier as part of its commitments to the Paris Agreement. 80% of respondents expect China to achieve the carbon emissions peak by 2030 (down from 87%), and 36% expect China's emissions to peak by 2025 or earlier (down from 48%). Only 10% of respondents are now of the view that China's CO₂ emissions may peak by 2020, down from 14% last year and a high of 25% in 2017.

China's emissions are expected to peak ahead of 2030

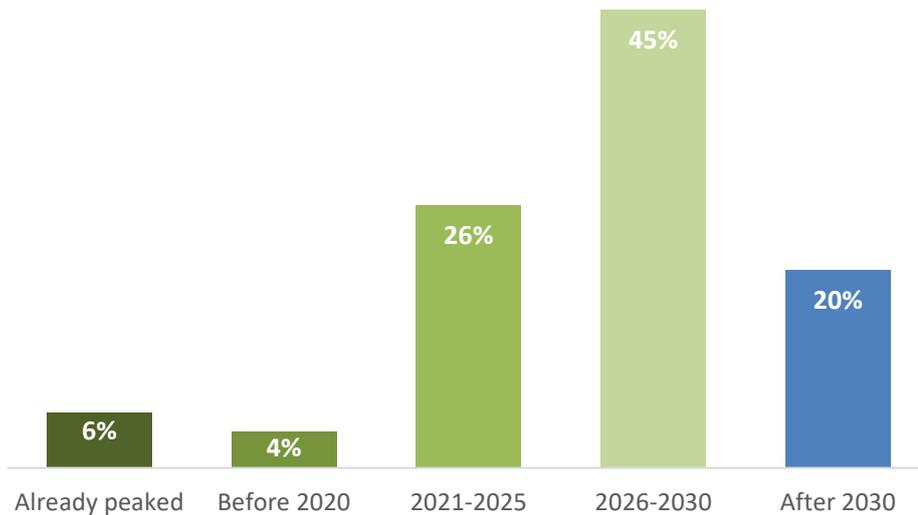


Figure 44 When do you expect China's emissions will peak? (n=362)

Appendix 1: Key policies issued for the pilots in 2018-19

Shenzhen	✓ The accumulated transaction amount reached CNY 1.091 billion in July 2018, which makes Shen the first pilot in China to reach CNY 1 billion.
Beijing	<ul style="list-style-type: none"> ✓ The number of covered entities in 2018 is 903, of which 624 entities are required to submit the report. ✓ An adjustment mechanism was created to avoid overallocation as a result of plant closures or reductions in production beyond a certain threshold. ✓ The base years to determine the historical intensity for free allocation in 2018 changed from 2014–2016 to 2015–2017.
Shanghai	<ul style="list-style-type: none"> ✓ The number of covered entities in 2018 is 298. ✓ The cap of 2018 is 158 million tons. ✓ Benchmarks for power generation sector increased, drawing close to the values of the national draft.
Guangdong	<ul style="list-style-type: none"> ✓ 288 enterprises were covered in 2018 (249 existing ones and 39 new entrants), slightly lower than previous year. ✓ The cap of 2018 is 422 million tons, among which 23 Mt CO₂e are kept as government reserves for new entrants and market stability ✓ The free allocation method for pulp production in the paper sector changed from benchmarking to the historical intensity method.
Tianjin	✓ No significant development.
Hubei	✓ Adjustment has been seen in heat and cogeneration sector: benchmark method based on emission was adopted in 2017, while historical method based on emission intensity was applied in 2018.
Chongqing	<ul style="list-style-type: none"> ✓ The number of covered entities in 2018 is 195. ✓ The cap of 2018 is 100 million tons.
Fujian	✓ No significant development in 2018

Table A-1 Key policies issued for the carbon trading pilots in 2016-17.

Appendix 2: CCER registration and issuance status

As of September 30, 2019, 2,856 Certified Emission Reduction (CCER) projects had been publicized for review and 1,047 had been registered (287 of which had been issued). Among those issued, the certification reports for 254 (representing 52.94 million tons of CCERs) are publicly available.



Figure A-1 Number of CCER projects.

Of these 254 projects, 139 are Type I (18.9 million tons of CCERs issued), 17 are Type II (3.7 million tCO_{2e}), and 98 are Type III (30.3 million tCO_{2e}).¹³ In addition, wind, small-scale hydro, solar PV and household biogas projects are most popular, due in part to the offset rules for CCERs in the pilot carbon markets. The details are displayed in Figures A-2 and A-3.

	Wind	Hydro	Solar PV	Household biogas	Total
Total projects	90	32	48	41	254
Millions of tCO _{2e}	12.5	13.4	2.7	6.3	52.9

Table A-2 Publicly detailed CCER projects, as of September 30 2019

¹³ According to regulation on the management and operation of CCER projects issued by the NDRC, there are four categories of CCER projects. Category 1 refers to newly developed CCER projects. Category 2 refers to those projects which get a Letter of Approval from the Designated National Authority but are not yet registered with the CDM Executive Board. Category 3 refers to those registered CDM projects applying for issuance of emissions reductions generated before the date of registration, known as Pre-CDM projects. Category 4 refers to those registered CDM projects for which the CDM Executive Board has not issued any emissions reductions.

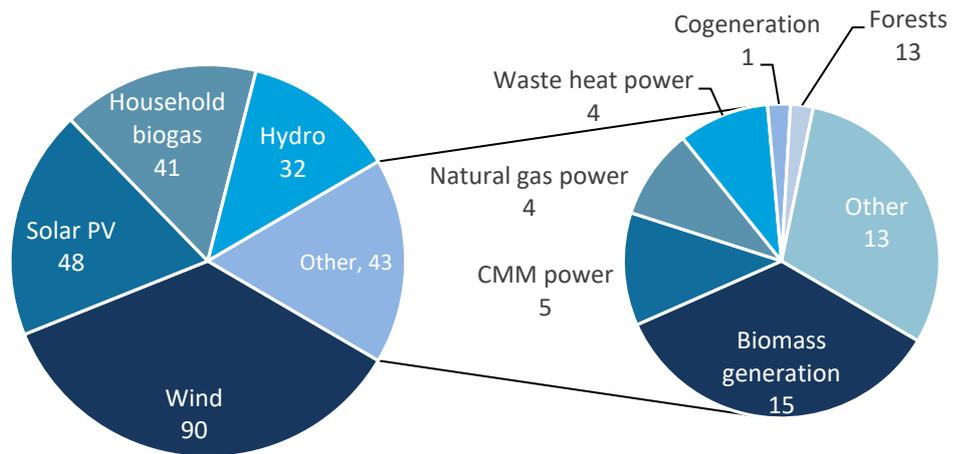


Figure A-2 CCER projects by type (number of projects issued)

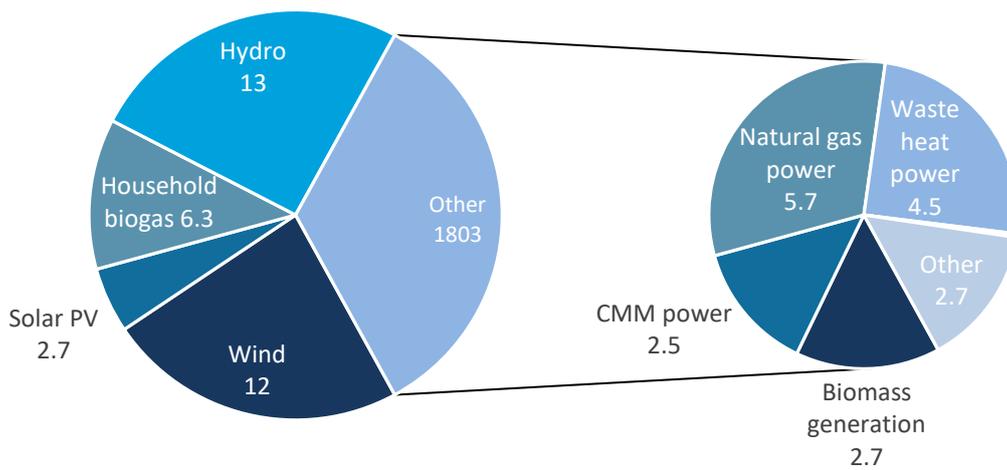


Figure A-3 CCER trading volume (million tons)

Project partners

China Carbon Forum (CCF) is an independent and neutral platform to engage stakeholders in China's climate change sector. CCF prepares research and organises focused events to discuss climate change issues in specific sectors, including networking events, research, and policy consultations to discuss removal of barriers to emissions reductions, and to develop a more climate resilient society.

ICF is recognised as a leading global provider of climate change policy expertise. The firm has offices and energy/climate experts in the U.K., China, India, Europe and North America. ICF has over 1,500 professional employees dedicated to the study of energy, environmental, and climate change issues. ICF's Beijing office, brings in-depth knowledge of the key energy, environment, economic, and policy issues in China with a 20-year track record of continuous climate policy capacity building in China and an extensive network of partners and relevant stakeholders. ICF was awarded the best Advisory/Consultancy in China Carbon Markets by Environmental Finance Magazine in the "Annual Market Rankings" for two years in a row (2017 and 2018).

SinoCarbon Innovation & Investment Co., Ltd. (SinoCarbon) was founded in 2010 and is committed to becoming a leading integrated low-carbon service provider in China with a focus on pushing low carbon development through various innovative practices. With a profound background in energy, environment and finance industries, SinoCarbon possesses a low-carbon innovation team of nearly 200 professionals in the fields of energy, information, environment, finance, business, and legal and public policy, skilled and experienced in low carbon consultancy and research. Through constant innovation, SinoCarbon has gained an outstanding reputation in the industry.

The Dutch Emissions Authority (Nederlandse Emissieautoriteit, NEa) is a competent authority which ensures that companies taking part in the European Emissions Trading System (EU ETS) and the laws and regulations governing renewable energy for transport and air pollution from fuels fulfil their obligations. The NEa does so by providing information and advice and by monitoring the companies involved (among other activities).

The Norwegian Environment Agency is working for a clean and diverse environment. Its primary tasks are to reduce greenhouse gas emissions, manage Norwegian nature, and prevent pollution. It is a government agency under the Ministry of Climate and Environment and has 700 employees at its two offices in Trondheim and Oslo and at the Norwegian Nature Inspectorate's more than sixty local offices. It implements and gives advice on the development of climate and environmental policy. It is professionally independent. This means it acts independently in the individual cases that it decides and when it communicates knowledge and information or gives advice.

Project funders



The Embassy of the Federal Republic of Germany

Within the framework of their comprehensive strategic partnership, Germany and China work together also on environment and climate change. Global climate change is a challenge that Germany and China are both countering resolutely. At the political level there is an intensive cooperation in the German-Chinese working group on climate change, in informal forums such as the Petersberg Climate Dialogue and within the framework of the international UN climate negotiations. A key area of the joint work is the support for the implementation of the emissions trading in China. Key fields of environmental cooperation include air and water pollution prevention, soil protection, biodiversity, sustainable transport and eco-labelling as well as the China Council for International Cooperation on Environment and Development.



The Royal Norwegian Embassy

Norway and China have worked together on environment and climate issues for nearly two decades. The cooperation has focused on environmental management and capacity building. Norway supports projects that contribute to China's implementation of global environmental conventions, drawing on highly skilled Chinese and Norwegian partners with core competence in the areas singled out for collaboration. Priority areas for the cooperation have been biodiversity, climate change and management of hazardous substances, such as POPs and Mercury. Norway also gives great importance to our participation in and support to China Council for International Cooperation on Environment and Development (CCICED), a high-level advisory body to the Government of China.



Kingdom of the Netherlands / Ministry of Economic Affairs and Climate Policy

The Ministry of Economic Affairs and Climate Policy works with China in the different fields of its portfolio: infrastructure, spatial planning, water resource management, transport and environment and climate. The Ministry has supported China in its work on environment and development for more than 25 years.

For this specific project the Dutch Emission Authority (NEa) was assigned by the Ministry to share its experience and give input. The NEa is the competent authority of the Netherlands which ensures that companies taking part in the European Emissions Trading System (EU ETS) fulfil their obligations and has therefor ample experience to support China in its efforts to set up a ETS.



Energy Foundation Beijing Representative Office (Energy Foundation China), established in Beijing in 1999, is a grantmaking charity organization dedicated to China's sustainable energy development. As part of the U.S.-based Energy Foundation, it is registered under the Beijing Municipal Public Security Bureau and supervised by the National Development and Reform Commission of China.

Our mission is to assist in China's transition to a sustainable energy future by promoting energy efficiency and renewable energy.

Energy Foundation China, previously known as the China Sustainable Energy Program, was initiated with funding from the David and Lucile Packard Foundation and the William and Flora Hewlett Foundation. Over the years, Energy Foundation China has achieved steady growth, with our pool of funders growing. Our cumulative grantmaking in China reached more than USD260 million through 2016.

They support policy research, the development of new standards, capacity building, and dissemination of best practices across seven programs: clean power, environmental management, industry, low carbon economic growth, low carbon cities, transportation, and strategic communications, with a view to assisting China in coping with energy challenges.

By the end of 2016, Energy Foundation China had funded 2,600 projects operated by 670 grantees in China. The grantees include leading policy research institutes, academies, industry associations, local energy efficiency institutions, and NGOs in China and abroad, such as the Development Research Center of the State Council, the Energy Research Institute of the National Development and Reform Commission, Chinese Academy of Fiscal Sciences, Chinese Academy of Sciences, Tsinghua University, etc.

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