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# 2018 CHINA CARBON PRICING SURVEY

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## **Abstract**

This report summarises the results of the *2018 China Carbon Pricing Survey*. The survey elicited expectations about the future of China's carbon price from stakeholders in carbon markets in China during April 2018. Through cooperation with industrial associations, strong efforts were made to survey representatives from China's carbon-intensive industries, including power, cement and aluminium, which are already subject to, or are soon expected to be subject to carbon pricing. The results of the survey 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 launched its development plan for a national emissions trading system in late 2017. However, on average, the survey respondents' expectation is that it could take until at least 2020 before the national ETS is fully functional. In the lead up to the national ETS, significant capacity building has been conducted, but much more is needed. A large majority of respondents prefer a strong legal basis for the ETS from its initial phase, with at least State Council regulation in place. ETS is expected to become the most important policy instrument to motivate companies to reduce GHG emissions in the coming decade. There is strong confidence that China will meet its target to peak emissions by 2030. Many expect that the peak in emissions will be reached significantly earlier.

## **Keywords**

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

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## Executive summary

This report is a summary of results from the *2018 China Carbon Pricing Survey*, jointly conducted by China Carbon Forum, ICF, SinoCarbon, Tsinghua University China Carbon Market Center, the Norwegian Environment Agency and the Dutch Emissions Authority.

The survey, undertaken from late March to late April 2018, obtained expectations about the future of carbon pricing in China from 317 stakeholders. The survey is a collective “best guess” by these stakeholders. It does not claim to be representative, but it does provide a clear indication of dominant stakeholder views about the likely future of carbon pricing in China. The project builds on similar surveys conducted in 2013, 2015 and 2017.

This is the first market survey undertaken after the December 2017 official launch of the ‘Development Plan’ for a national ETS in China, and comes at a time of global interest in China’s climate action, given the negotiations on rules for implementation of the Paris Agreement, as well as the new Ministry of Ecology and Environment taking charge of climate change mitigation efforts. The Development Plan outlines the roadmap for development of the national ETS, and confirms a three-phase roadmap: a capacity building phase, a simulation trading phase, and a market operation phase. The national ETS will start with the power generation sector, and gradually cover other sectors once certain conditions are met.

## Respondents

The survey received 317 responses from professionals in a range of sectors, including industry (67%), consultancies (10%), academia (6%), carbon finance (4%), local government and research institutes (3% each). Other respondents include those from NGOs, carbon exchanges and industry associations. Half of all respondents are either covered by regional systems, or are likely to be included in the forthcoming national ETS. This is much higher than for previous surveys (2017: 16%; 2015: 18%; 2013: 7%). The majority of the industry responses were facilitated by the distribution of the survey by industry associations to their members, including 90 from the power sector, 47 from the cement sector, and 46 from the non-ferrous metals sector (aluminium and copper). The remaining 31 industry responses were received through the network of the project partners. While it is likely that on average, the industry respondents which responded to the survey are at a more advanced stage of preparation for the carbon market than those which didn’t respond, the extent of engagement through industry associations means that this bias is less significant than for previous surveys.

## China’s carbon market progress

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

The December 2017 announcement of the national ETS Work Plan laid out a three-phase process towards a fully functioning market, with the first two preparatory phases lasting each for about one year. Our survey respondents were asked by when they expect China’s national ETS to be fully functional. Only 19% of respondents expect this to occur by 2020 or earlier (down from 47% in 2017).<sup>1</sup> This drop is likely due to the wait until the start of trading in the national ETS. 72% of respondents expect a fully functional carbon market by 2025.

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<sup>1</sup> 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.”

The legal basis for the national ETS is still under development. The State Council is expected to pass overarching regulation during 2018, which 39% of survey respondents believe should be sufficient to ensure compliance, while a majority (55%) believe a law passed by the National People’s Congress is necessary. Industry respondents are split on this issue however (46% vs 44%).

Respondents expect carbon emissions trading to increasingly affect investment decisions in coming years. In 2018, 34% of those who expressed a view, expect investment decisions to be strongly or moderately affected, and by 2025 this figure rises to 75%.

**Carbon emissions trading is expected to increasingly affect investment decisions**

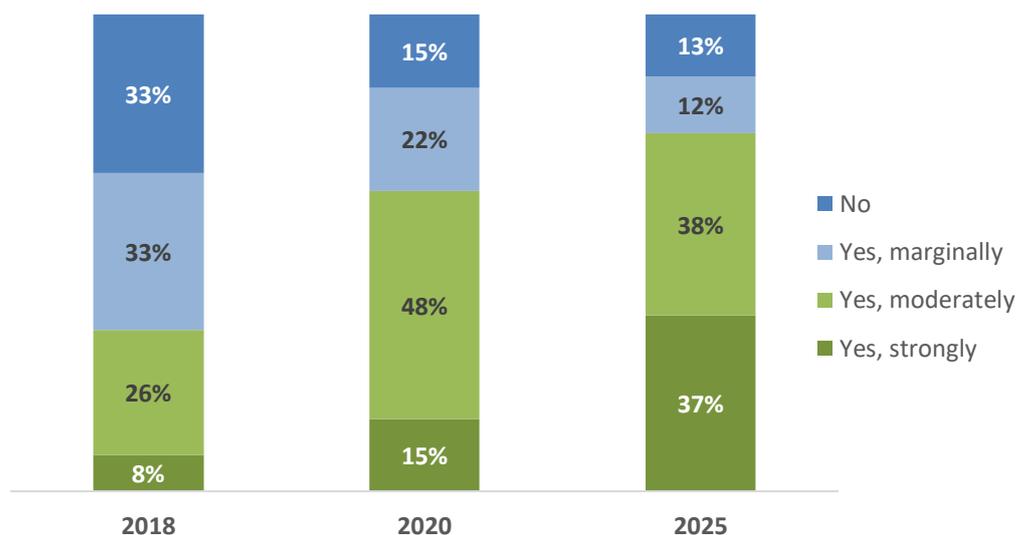


Figure 1 Q3-1: Do you expect the ETS in China to affect investment decisions in...? (N=304, 292, 285)

**Price expectations**

Average price expectations in the national ETS are CNY 54/ton in 2020 and CNY 98/t in 2025. However, the price levels remain highly uncertain, especially in the more distant future. The 20<sup>th</sup> and 80<sup>th</sup> percentiles for 2025 are CNY 35/t and CNY 158/t respectively. The future price expectations are lower than at the time of the 2017 survey.<sup>2</sup>

**China’s carbon price is expected to steadily rise**

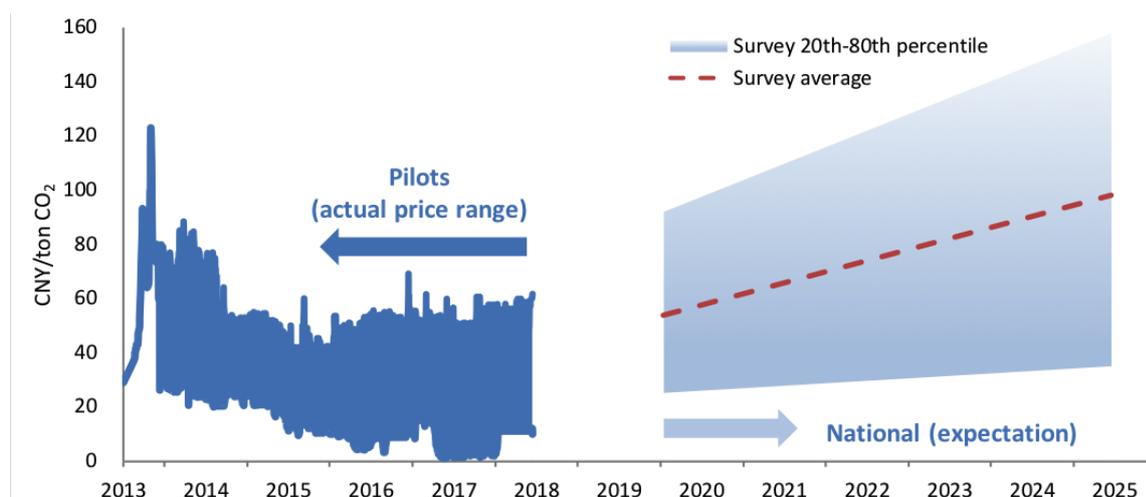


Figure 2 Range of prices in the pilot systems to-date, and estimated prices for the national system.

<sup>2</sup> The average price expectation in the 2017 China Carbon Pricing Survey were CNY 38/ton in 2017; CNY 51/t in 2018; CNY 74/t in 2020; CNY 108/t in 2025. The 20<sup>th</sup> and 80<sup>th</sup> percentiles for 2025 are CNY 50/t and CNY 200/t respectively.

### Carbon pricing in the mix of policy instruments

Respondents were asked what they expect to be the most important policies to reduce GHG emissions in future years (Figure 3). The expectation is that, over time, the emphasis will shift towards ETS, environmental tax, information disclosure, and energy allowances trading.

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

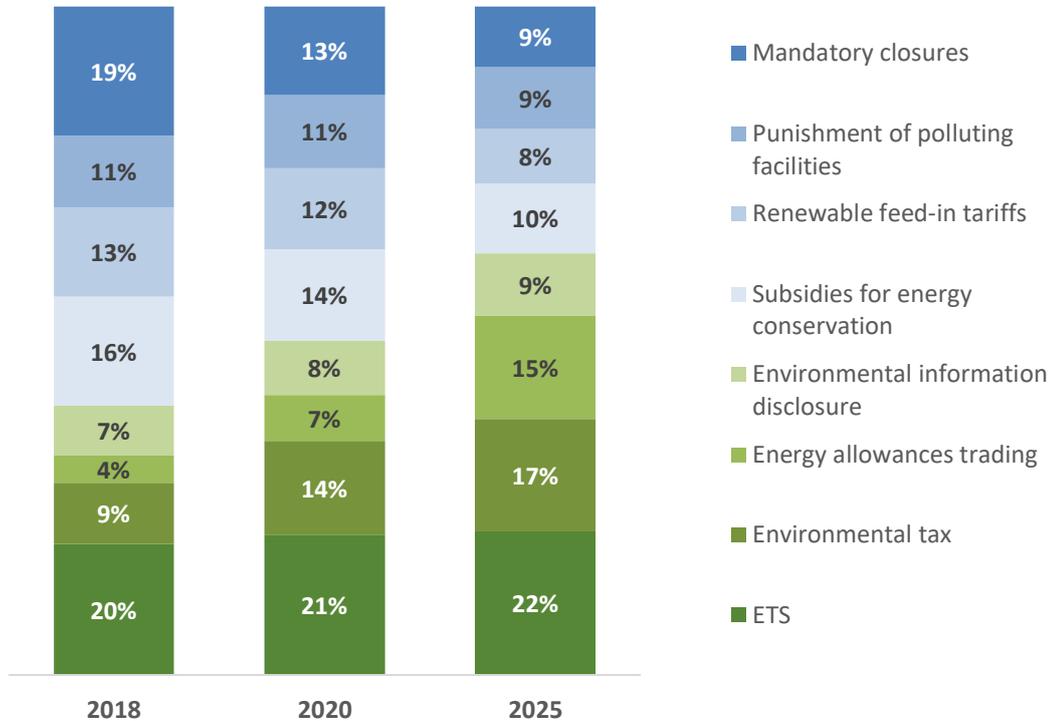


Figure 3 Q3-4: Which do you expect to be the most important policies in motivating companies to reduce GHG emissions in China at different points in time? (N=314, 295, 284)

### China’s emissions targets and peak emissions

87% of respondents expect China to achieve the carbon emissions peak by 2030, and 48% expect China’s emissions to peak by 2025 or earlier.

#### **China’s emissions are expected to peak ahead of 2030**

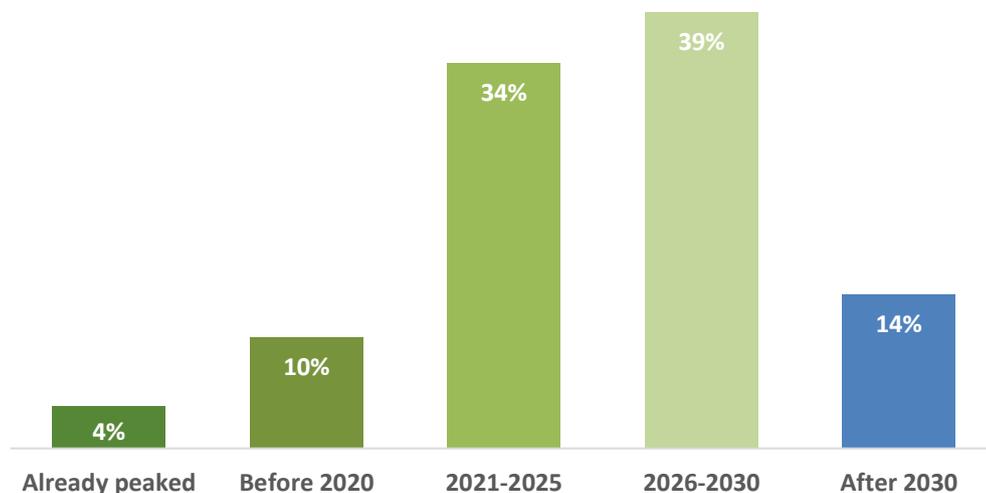


Figure 4 Q3-5: When do you expect China’s emissions will peak? (N=132)



## Survey introduction

This report presents the results from the *2018 China Carbon Pricing Survey*, jointly conducted by China Carbon Forum, ICF, SinoCarbon, Tsinghua University China Carbon Market Center, the Norwegian Environment Agency and the Dutch Emissions Authority. The project builds on similar surveys conducted in 2013, 2015 and 2017. 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, including power, cement and aluminium, which are already subject to, or are soon expected to be subject to carbon pricing.

This is the first market survey undertaken after the December 2017 official launch of the 'National Carbon Market Development Plan', and comes at a time of global interest in China's climate action, given the negotiations on rules for implementation of the Paris Agreement, as well as the new Ministry of Ecology and Environment taking charge of climate change mitigation efforts. The Development Plan outlines the roadmap for development of the national ETS, and confirms a three-phase roadmap: a capacity building phase, a simulation trading phase, and a market operation phase. The national ETS will start with the power generation sector, and gradually cover other sectors once certain conditions are met.

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.<sup>3</sup> 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 some emissions trading systems use 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 a period of around one month, the survey received 317 responses from professionals in a range of sectors, including industry, consultancies, academia, carbon finance, local government and research institutes. Half of all respondents are either covered by regional systems, or are likely to be included in the forthcoming national ETS. While it is likely that on average, the industry respondents which responded to the survey are at a more advanced stage of preparation for the carbon market than those which didn't respond, the extent of engagement through industry associations means that this bias is less significant than for previous surveys.

In addition to the survey itself, the project team conducted three industry stakeholder roundtables on ETS, focused on monitoring, reporting, verification and accreditation (MRVA) in the power sector; key carbon emitting sectors preparing to join the ETS; and, MRVA in the cement and aluminium sectors. The roundtables involved industry representatives and sectoral associations, together with

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<sup>3</sup> Carbon intensity refers to the level of carbon emissions per unit of GDP (CO<sub>2</sub>/CNY GDP).

government experts on carbon market development. The aim of the roundtables was to, on the one hand, to provide a channel for communication of industry opinions on ETS design to policymakers, and on the other, 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 China's carbon market. 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. 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 because of self-selection of those who chose to respond to the survey.

The expectations about future carbon prices derived from surveys such as this one 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 policy-makers and market participants.

## **Update on carbon emissions trading in China**

During 2013 and 2014, pilot carbon markets were launched in five municipalities (Beijing, Chongqing, Shanghai, Tianjin and Shenzhen) and two provinces (Guangdong and Hubei). In recent years, pilot regions have further developed their markets by expanding coverage, refining their allocation mechanisms, and introducing derivative products. Subsequently, Fujian ETS was launched in late 2016. For a summary of key policies issued for the pilots in 2017-18, see Appendix 1.

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 "Development Plan"). The 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. The national ETS will start with the power generation sector, and gradually cover other sectors once certain conditions are met.

### **Recent highlights**

#### ***Monitoring plans, data reporting and verification for 2016 and 2017***

On December 15, 2017, the NDRC issued a notice requiring reporting and verification of 2016 and 2017 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, 2018, while verification, review and submission should be completed by May 31, 2018.

The notice covers eight industrial sectors, which means that in the long run, the plan for the integration of eight sectors into the national ETS has not changed. Compared with the requirements for 2013-15, the biggest changes lie in two aspects. First, the formulation of a monitoring plan is now required, which is of positive significance for improving the MRV system in the national carbon market and consolidating the database. Second, indirect emissions attributable to large electricity consumers are intended to be covered by the national ETS, so a uniform average emissions factor on the electricity grid was adopted for the purpose of calculation of GHG emissions from power and heat consumption, with a value of 0.6101 tCO<sub>2</sub>/MWh.

#### ***National Emissions Trading System Development Plan for the Power Sector released***

The NDRC announced on December 19, 2017, that the power generation industry will be the first sector covered by the national carbon emission trading system. The plan also clarified the scope of coverage, principles for the ETS, exclusion of non-covered entities, identification of responsible authorities, and laid the foundation for further preparatory work.

The construction of the national carbon market will proceed in three phases: a foundational phase (including the set up of market infrastructure and capacity building), a simulation trading phase, and

a deepening and expanding phase (see Figure 1 below). The key tasks in 2018 with regard to the policy and regulatory framework for the national carbon market, include the issuing of regulation which will serve as the over-arching legal foundation of the ETS, as well as three technical regulatory documents on ‘emissions reporting and verification’, ‘accreditation of third-party verifiers’, and ‘regulation of trading activity’. Four key support systems will be established: an ETS registry, a trading platform, settlement and reporting systems. The emissions reporting and verification work for 2016-2017, and improvement of the allowance allocation plan for the power generation industry also need to be finalised. Although the national carbon market is beginning to take shape, the compliance time of the power sector, the inclusion of other sectors, China Certified Emission Reduction (CCER) rules, trading rules, and transition plan for the regional carbon markets remain to be clarified.



Figure 1 Roadmap for the national ETS.

### **China’s central bank allows overseas investors to participate in China’s carbon market**

On January 6, 2018, the People's Bank of China issued an official Notice on improving cross-border CNY business to promote trade and investment. The notice clarified regulations on handling cross-border settlement of CNY for carbon emission trading by overseas investors, encouraging investors to participate in China’s carbon market.

### **Ministry of Ecology and Environment takes responsibility for the national ETS**

In March 2018, the 1<sup>st</sup> session of the 13<sup>th</sup> National People's Congress reviewed and approved the State Council's institutional reform plan. The responsibility for combating climate change and reducing emissions has been transferred from the National Development and Reform Commission to the Ministry of Ecology and Environment (MEE), which is likely to promote the synergy between the development of a national carbon market and efforts to reduce air pollution.

### **China Securities Regulatory Commission encourages research on carbon futures**

On May 21, 2018, the Party Committee of the China Securities Regulatory Commission held a meeting to convey the spirit of the National Conference on Environmental Protection, and plan its implementation. The meeting called for reference to international experience in order to research and develop new types of commodity futures such as carbon emission futures, exploration and utilization of the market to assist air pollution control and combat climate change.

### Reform of offset registry system completed

In May 2018, under the coordination of the Administrative Office of CCER Registry, CCER transaction agencies in Beijing, Tianjin, Shanghai, Chongqing, Hubei, Guangdong, Shenzhen, Fujian and Sichuan provinces finished connection and testing of the upgraded CCER system. The CCER system was successfully restored to handle registration of CCER trades, while the rules for future approval and issuance of CCERs are still under development.

### Transaction data for China's carbon market

#### Pilots

As of April 30<sup>th</sup>, 2018, 222 million tons of allowances had been traded in the primary and secondary markets, with a value of CNY 5 billion. The regional markets can be divided into three groups by transaction volume and value from the highest to the lowest: 1) Guangdong, Hubei; 2) Shenzhen, Shanghai, and Beijing; 3) Tianjin, Chongqing, and Fujian.

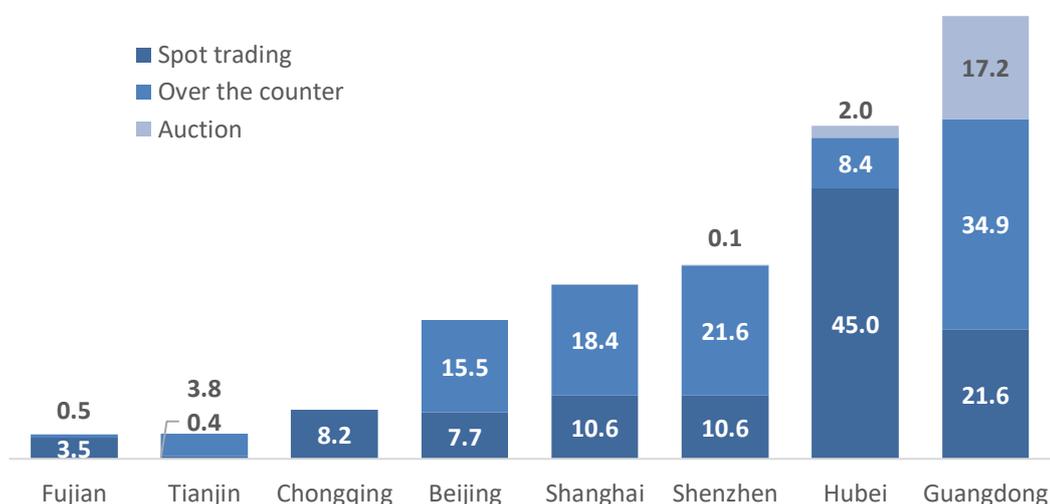


Figure 2 Cumulative trading volume in the 8 regional markets to May 31, 2018 (million tons).

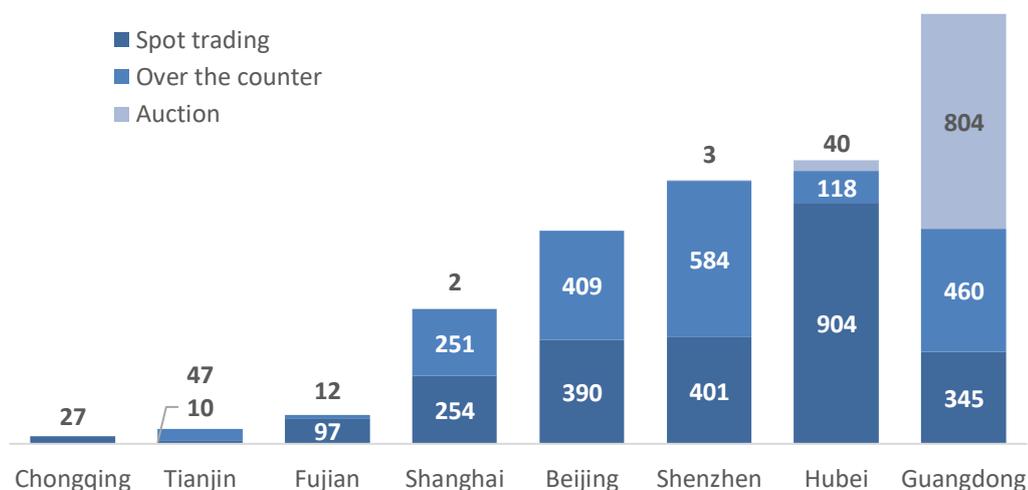


Figure 3 Cumulative trading value in the 8 regional markets to May 31, 2018 (million CNY).

For each compliance period, the trading volume showed an upward trend year on year. However, the 2017 compliance period (August 2017 to June 2018) is still ongoing.

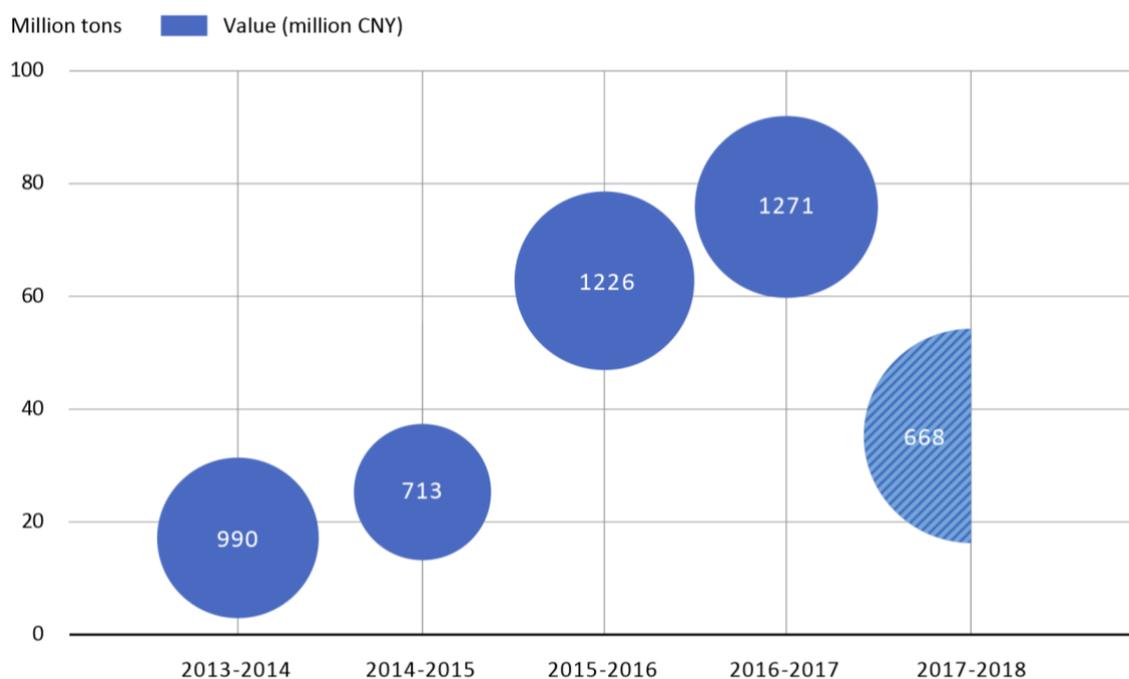


Figure 4 Trading volume and value of primary and secondary market in pilots (million tons/CNY).

### Allowance prices stayed relatively stable during 2017-18

Beijing	The price in Beijing was above CNY 50/ton for most of the year.
Shanghai	The price stayed around CNY 30-40/ton. After the completion of compliance at the end of June 2017, the price experienced a brief decline and gradually recovered.
Shenzhen	The price stayed around CNY 30/ton. After the completion of compliance at the end of June 2017, the price experienced a brief decline and gradually recovered.
Chongqing	Chongqing has seen a "U" trend since 2017. Before March 2017, the price was around CNY 15/ton, which fell to CNY 1/ton afterwards. From the end of 2017, the price started to recover and the current value is close to CNY 30/ton.
Fujian	Fujian's price has been stable at around CNY 35/ton since its launch, and began to decline since the compliance season of 2017. The current value is below CNY 20/ton.
Hubei	Hubei has been stable around CNY 15/ton.
Guangdong	Guangdong has been stable around CNY 10-20/ton.
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 2017/18, ranked in order of price at the close of trading on April 30, 2018.

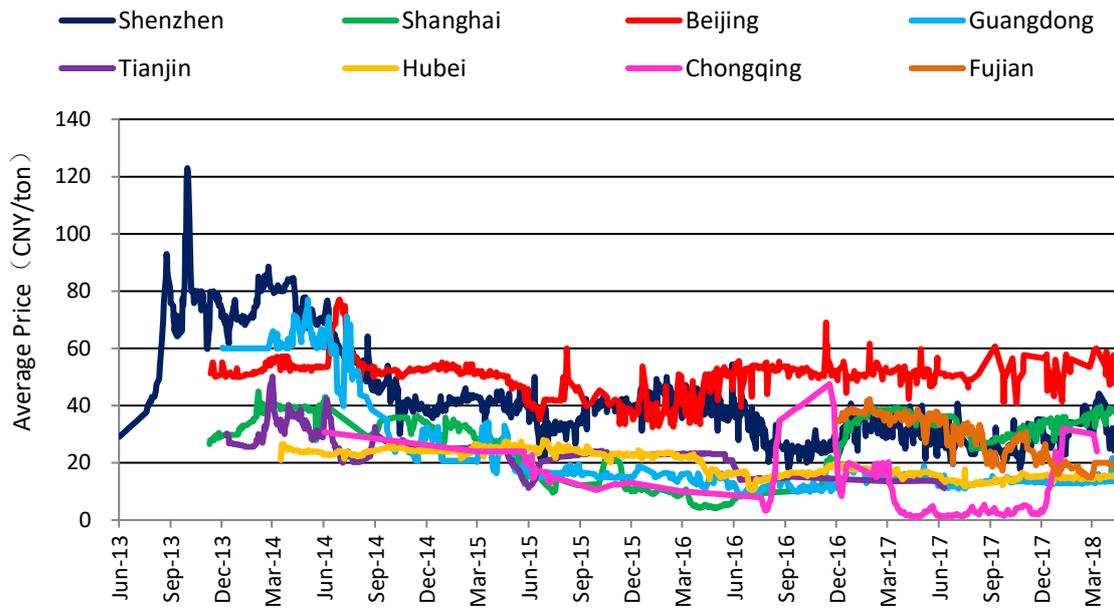


Figure 5 Daily average price of online trading (CNY/ton), 18<sup>th</sup> June, 2013 - 30<sup>th</sup> April, 2018.

There was no noticeable effect on prices from the December 2017 NDRC announcement. While the price in Chongqing did increase sharply around that time, this was more likely due the volume of trading activity dropping sharply in the final two weeks before the compliance deadline (January 5), meaning a small number of trades could affect the price rather than real supply and demand.

### CCERs

As of April 30<sup>th</sup>, 2018, over 2,800 CCER projects had been issued, and a cumulative 134 million tons CO<sub>2</sub> traded. Between July of 2017 and May of 2018 only 15 million were traded, much less than the level of the last compliance period (Figure 6). This may be due to two factors: 1) No new CCERs have been issued since March 2017, and the CCER registry was suspended between January and May 2018 (see ‘Recent Highlights’ above), thus reducing the overall circulation of allowances in the market; 2) Investors felt uncertain about the future of CCERs in the national ETS, thus feeling hesitant to invest and hold CCERs. For further detail on CCER registration and issuance, see Appendix 2.

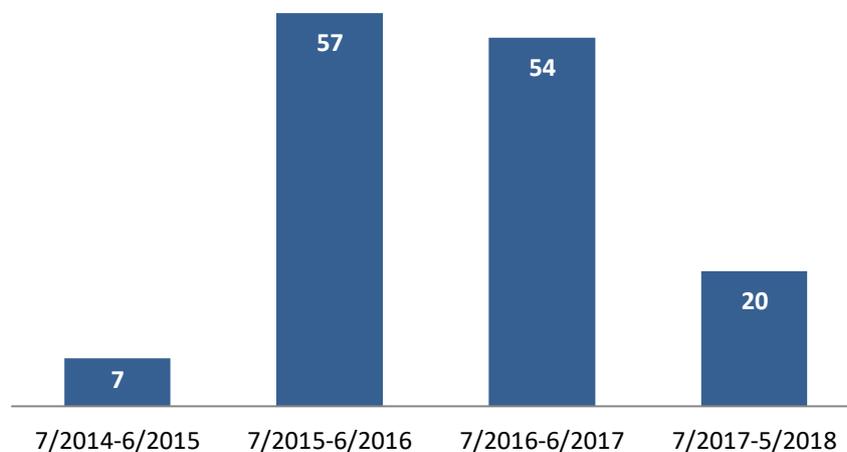


Figure 6 CCER trading volume (million tons).

## Status of National ETS

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

	Current status	Future trends
<b>Policy</b>	<ul style="list-style-type: none"> <li>National ETS Development Plan released.</li> <li>Three phases of national ETS clarified: foundational work, simulation trading, deepening and expanding.</li> <li>Responsibility for climate change and emissions reduction has been transferred from NDRC to the MEE.</li> </ul>	Detailed implementation plan of National ETS needs to be clarified further.
<b>Coverage</b>	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.
<b>Allowance allocation</b>	Draft allocation plans for power generation, cement and electrolytic aluminium have been formulated, and trial calculation has been conducted.	Further improvement of the allocation plan is required, based on data for 2016-2017, before official release.
<b>Monitoring, reporting and verification (MRV)</b>	<ul style="list-style-type: none"> <li>NDRC issued notification to start the carbon emission monitoring plans, reporting and verification among the 8 industrial sectors.</li> <li>Most provinces/cities have started the MRV work as required, and are supposed to finish by end of May.</li> </ul>	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.
<b>Compliance</b>	Compliance mechanism is still under research.	No progress.
<b>Supporting systems</b>	Plan of developing registry, trading, settlement and reporting systems has been confirmed.	Registry will be located and managed in Hubei; Trading platform will be located and managed in Shanghai.
<b>Offsets</b>	The administrative measures on CCERs are still under revision.	CCERs will be included in national ETS once conditions are met.
<b>Transition plan of pilots</b>	Emitting entities in regional markets gradually incorporated into unified national ETS. Pilots will continue to play current role and gradually transition to national ETS once conditions are met.	The detailed transition plan is still in research.

Table 2 Status of National ETS (At May 31, 2018).

## Surveying China's carbon pricing stakeholders

The survey was conducted anonymously through a secure online survey platform, *Diaochapai*, from March 29 to April 30, 2018. Chinese language and English language versions were made available.

Those invited to participate in this survey were selected by industry associations, which achieved a high level of responses from companies likely to be subject to the national emissions trading system. The China Electricity Council, the China Cement Association and the China's Nonferrous Metals Industry Association each distributed the survey to their members. The survey was also sent to CCF and ICF's databases of contacts involved in China's carbon markets, as well as participants in the 2017 survey. The survey was also made available to potential respondents through targeted social media channels, in particular WeChat.<sup>4</sup> 317 eligible responses are included in the analysis.

This survey is the fourth 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, and the 2017 survey occurred in the lead up to the release of the central government's plan for a national market. The number of respondents this year was comparable to the 2015 survey (304) and 2017 survey (260), and much higher than in 2013 (86).

The survey covers 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. It is worth noting that the recent reorganisation of responsibilities between the NDRC and MEE was not known when participants filled out the survey, and that this reshuffle will likely cause some additional unforeseen delay to capacity building and finalisation of regulation for the ETS.

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

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<sup>4</sup> Project partner SinoCarbon shared the survey with its WeChat channel, which at the time had over 8,600 subscribers. The survey was also shared in several WeChat groups, including one managed by ICF on EU-China ETS capacity building (over 200 members) and a popular group for carbon industry professionals, "中国碳圈" (500 members). 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 317 respondents, 67% of respondents identified as being from industry, with half of all respondents either already covered by an ETS likely to be covered by the national ETS in the future. This compares with covered entities representing 16% of the 2017 survey, 18% in 2015, and 7% in 2013. Of the covered entities, the highest representation was from the power generation (26% of all respondents), followed by cement (15%), aluminium (6%), copper (1%) and petrochemical (1%) sectors. 28% of covered or likely to be covered entities have participated in the regional pilot systems. The majority of the industry responses were facilitated by the distribution of the survey by industry associations to their members, including 90 from the power sector, 47 from the cement sector, and 46 from the non-ferrous metals sector (aluminium and copper). The remaining 31 industry responses were received through the network of the project partners.

10% are representatives of consultancies whose work relates to carbon pricing. These respondents have typically been involved in advising local and national governments on the establishment of ETS pilots as well as preparation for a national ETS. 6% of respondents work in academia; 4% work in the carbon finance industry; 3% are from local government; 3% from government research institutes; 2% are from NGOs and 1% each from carbon emissions exchanges and industry associations. A further 4% of responses came from stakeholders in other sectors, including: legal professionals, carbon asset managers, developers of forest sinks and individual investors.

### Survey respondents by group

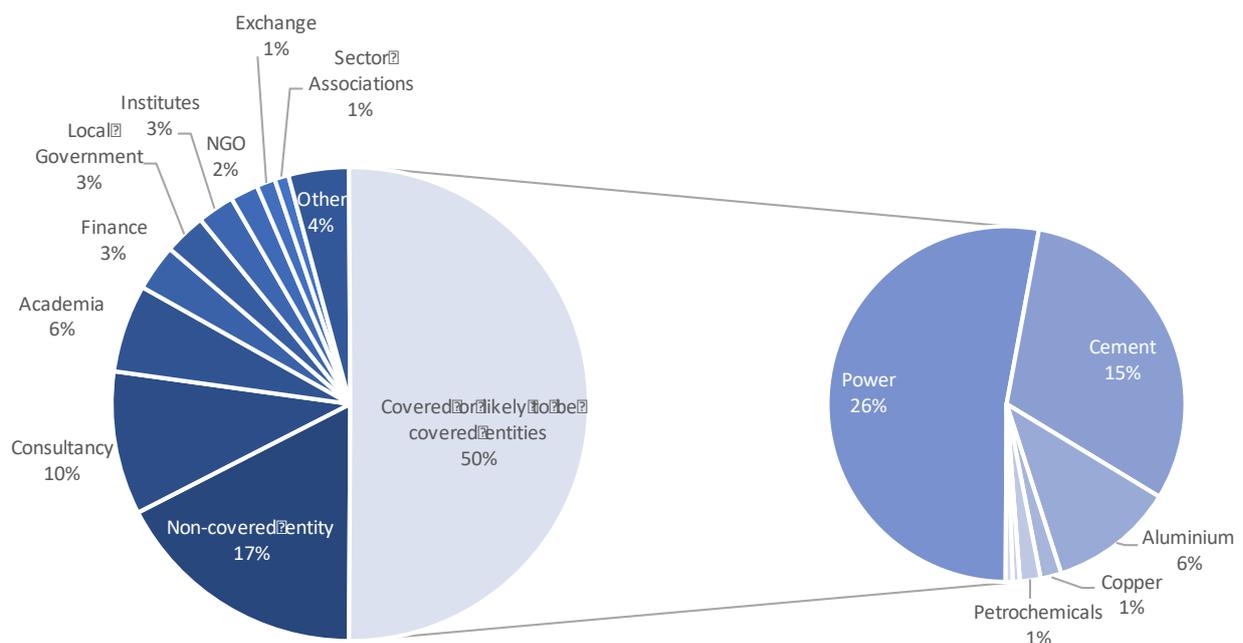


Figure 7 Q1-2 How would you classify your organization?  
 Note: total number of responses N=317. See Appendix for details.

315 (99%) respondents used the Chinese version of the survey, and 2 (1%) respondents used the English version. The ratio of Chinese respondents has increased with each iteration of the survey (51% in 2013, 92% in 2015 and 94% in 2017), showing that China's carbon market is increasingly a domestic effort.

## Industry responses

In total, 214 responses from industry were collected. The majority of these were facilitated by the distribution of the survey by industry associations to their members, including 90 from the power sector, 47 from the cement sector, and 46 from the non-ferrous metals sector (aluminium and copper). The remaining 31 industry responses were received through the network of the project partners.

45 of the industry respondents 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 (18), Shanghai (14) and Hubei (11). 8 industry respondents were from companies currently operating in an ETS outside of China, 7 of which are under the EU ETS. For these companies, working under more than one ETS jurisdiction may facilitate experience sharing, industry peer to peer learning, and eventual integration across systems.

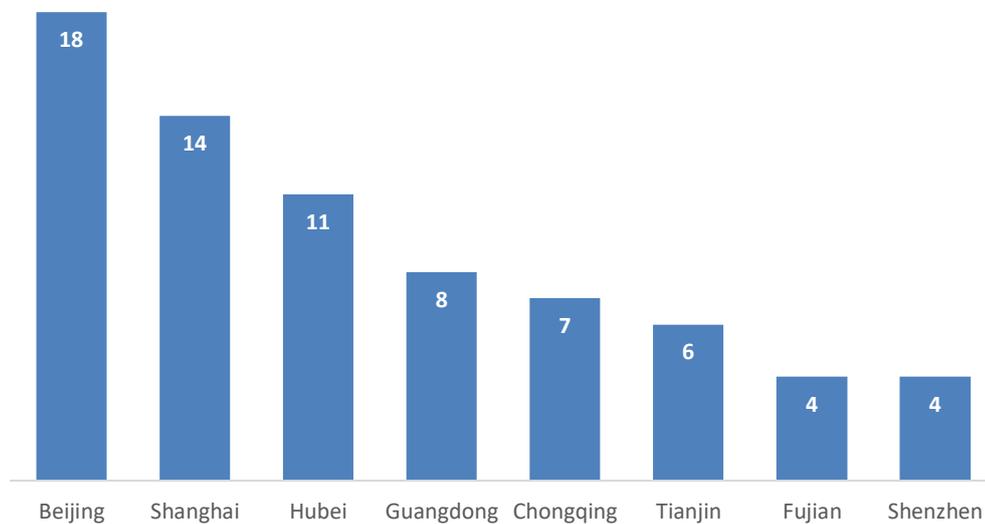


Figure 8 Q1-8: Is your company currently operating under an emissions trading system in China? If Yes: Which of the following? (N=45)

For respondents from covered or likely to be covered enterprises, about half identified as ‘general staff’, while between 20% of responses were from mid-level managers and 29% from senior executives.

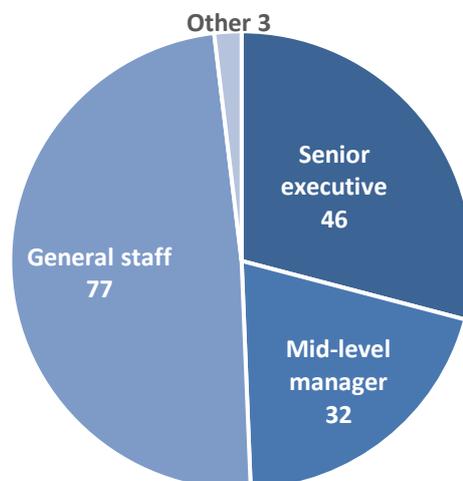


Figure 9 Q1-5: In the management structure of your company, what position do you hold? (N=158)

Of the responses from covered companies, 55% identified themselves as belonging to central state-owned companies, with another 22% from local state-owned enterprises. 15% of respondents from covered entities were from privately owned companies. About one third of the covered or likely to be covered companies reported energy consumption of over 1 million tce/year, and 40% reported consumption of between 10 thousand to 100 thousand tce/year. Very few responses (8), 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 (87) and local (36). Central government SOEs are among the largest emitters in China.

**Industry respondents by size and ownership type**

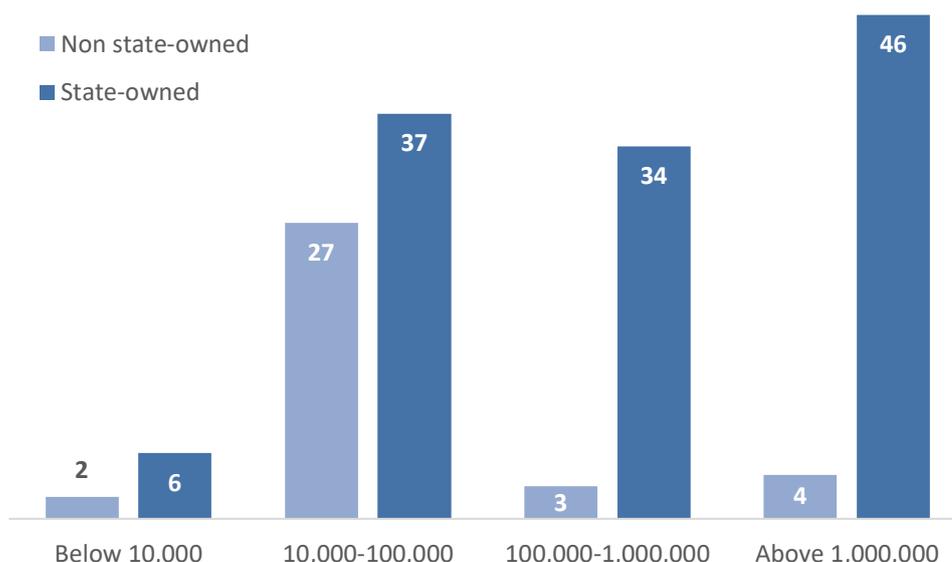


Figure 10 Q1-6 How much energy does your company annually consume in China? – by enterprise type (TCE/year) (N=159)

## Responses by region

22% of the respondents to the survey are from organisations located in Beijing. 39% were from provinces with pilot carbon markets, 59% from non-pilot regions, with the remaining 2% from organisations not based in mainland China.<sup>5</sup>

The high level of responses from Beijing reflects the concentration of the policy-making, consultancy, NGO 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 Shandong (8%), Jiangsu (6%), Henan and Inner Mongolia (5% each).

The concentration of responses from Beijing has reduced since previous surveys (down from 43% in 2015 and 37% in 2017), reflecting a growing understanding and willingness to engage with carbon markets in non-pilot regions.

### ***Survey respondents by region: increasingly widespread***

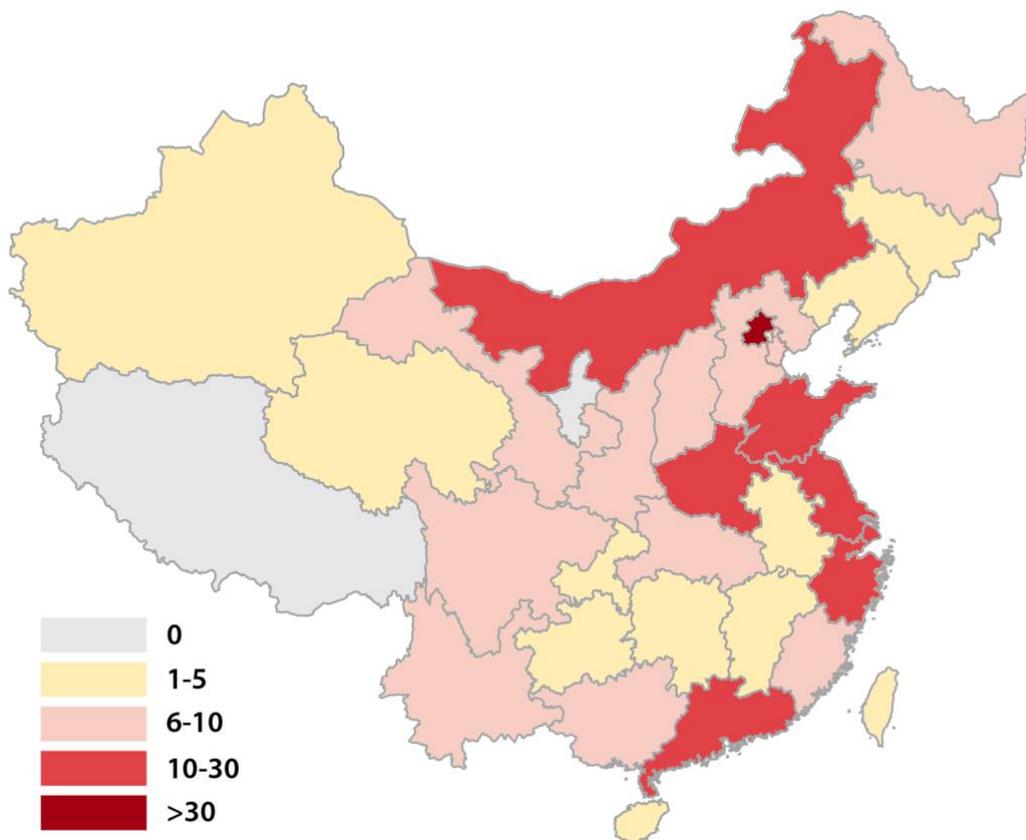


Figure 11 Q1-1 Where is your organization located? - Number of responses. (N=317)

<sup>5</sup> The distribution of respondents in the 2017 China Carbon Pricing Survey was 37% from Beijing, 61% from pilot regions, 30% from non-pilot regions and 9% from outside of mainland China.

## The pilot emissions trading systems

Since the pilot carbon markets were launched in 2013 and 2014, they have each now completed either four or five 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 6 on page 7 above. Around the time of the survey, prices ranged from CNY 13/t in Tianjin to CNY 59/t in Beijing. 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.

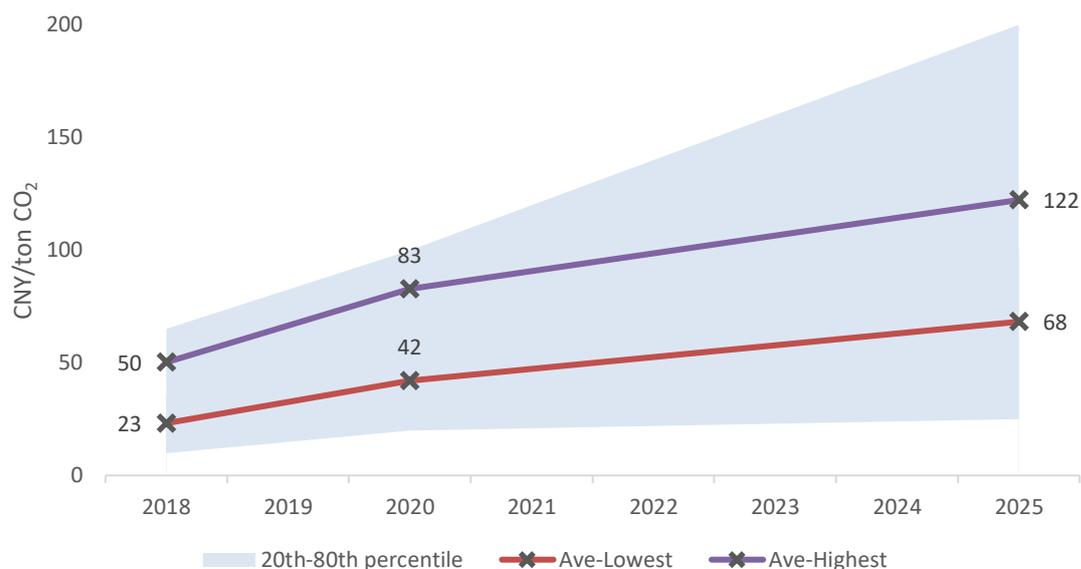


Figure 12 Q4-3: What do you expect the highest and lowest prices in the pilot regions to be in the coming years? (N=135, 130, 131)

#### Selected quotes: What do you expect the highest and lowest prices in the pilot regions to be in the coming years? Explain your answer:

- At present, the market is less active, the government has intervened significantly in the market and supply in the market exceeds demand, so the carbon price has not reached expectations. In the future, with the improvement of policy and high participation in the market, allowances will be gradually tightened in order to reach the national emissions reduction target, and the carbon market will gradually find its own value. – *Zhejiang power sector respondent*
- The ultimate target of the carbon price is to encourage enterprises to reduce carbon emissions. If the price is low, enterprises cannot benefit from emissions reduction and won't actively cut their emissions. If the price is high, it is not conducive to stable economic development. At the same time, carbon pricing should take the difficulty of overall energy efficiency improvement into account. – *Shaanxi non-covered entity*
- China is promoting the sound development of the carbon market, insisting on energy saving and emissions reduction, green development, low-carbon lifestyles, optimizing the structure of production capacity and building more reasonable natural and human environment. – *Guangdong carbon asset organisation*

About half of all respondents to this year’s survey expressed a view that carbon prices in the pilots at the time of the survey, during April 2018, were lower than what they expected. While overall this perception has not changed since last year’s survey, there is a significant divergence in views this year between covered industry and other respondents, which did not exist last year. Also, while only 14% of non-industry respondents considered current prices to be higher than expected, 36% of covered industry respondents expressed this view.

**Prices in the ETS pilots were lower than expected**

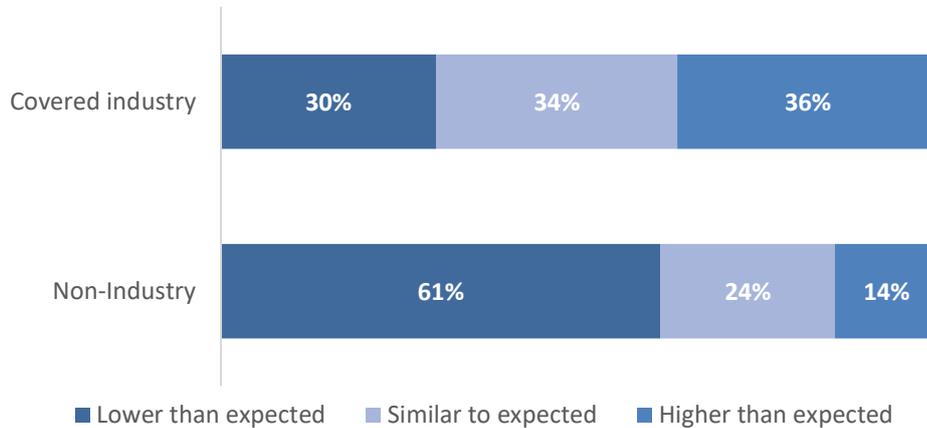


Figure 13 Q4-1 How do the current prices in ETS pilots compare with your expectations? (N=278)

**Factors influencing prices**

When asked what the main factors are influencing prices in the ETS pilots, a large majority of respondents (212 out of 260) identified ‘cap setting and free allocation’ as the most important factor, whilst a majority (171 out of 269) also identified ‘government regulation and intervention’ as a factor. This is similar to results from the 2017 survey. A significant divergence occurred, however, in relation to allocation, where pilot entities saw it as of roughly equal importance to government intervention, while other respondents saw cap allocation as by far the most important factor. In addition, pilot entities placed relatively less emphasis on information transparency and economic growth, and more emphasis on market speculation than other respondents.

**Factors influencing prices by respondent group**

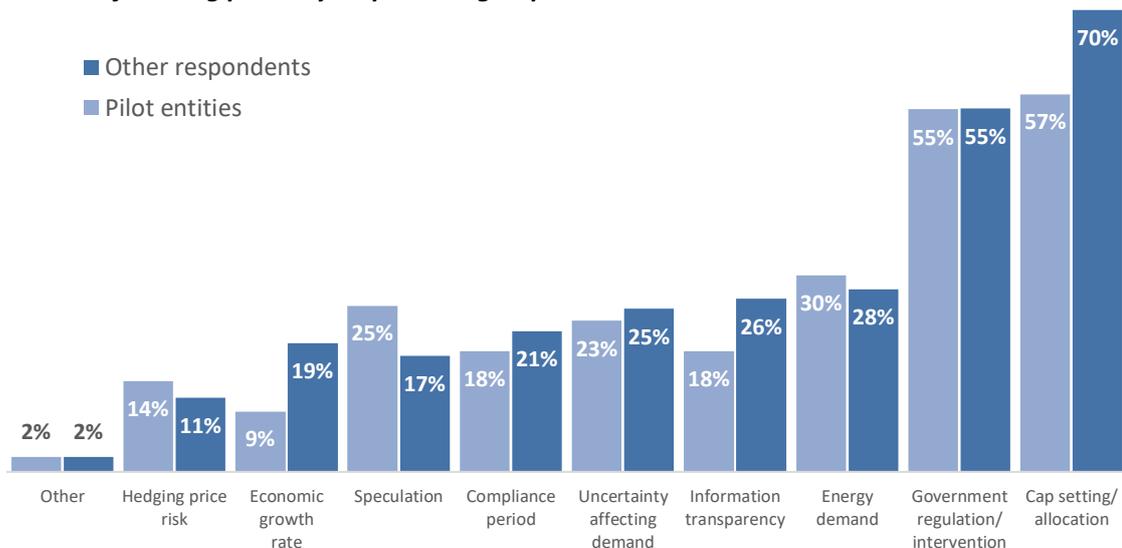


Figure 14 Q4-2 In your opinion, what are the main factors influencing prices in the ETS pilots? (N=269)

## 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 19% of respondents expect this to occur by 2020 or earlier (down from 47% in 2017).<sup>6</sup> This drop is likely due to the wait until the start of trading in the national ETS. 53% of respondents expect a fully functional carbon market between 2021 and 2025. Notably, 11% of likely to be covered enterprises do not expect the carbon market to ever become 'fully functional'.

### *Uncertainty remains over when the national ETS is expected to be fully functional*

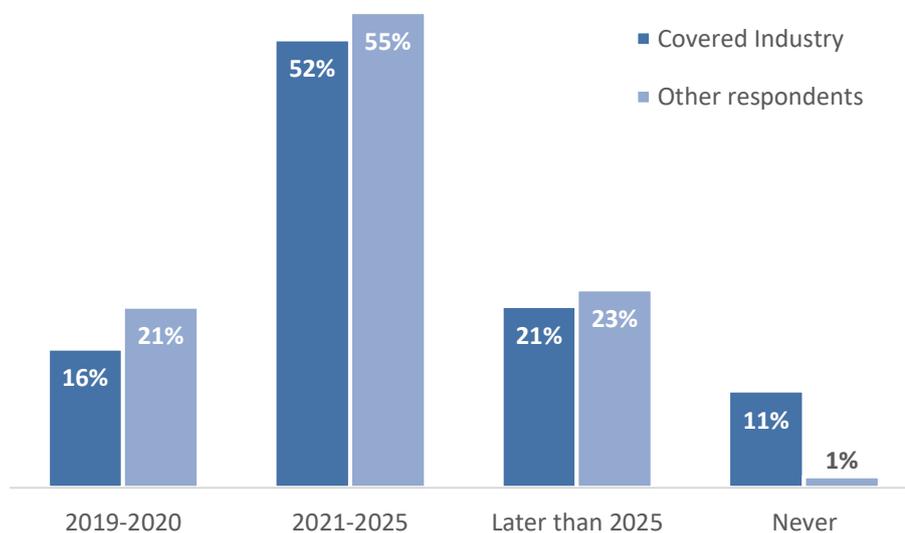


Figure 15 Q5-1 By when do you expect the China national ETS to be fully functional? (N=296)

<sup>6</sup> 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."

Respondents were asked by when they think that the power sector will be ready to begin carbon trading activity. Two thirds of respondents from the power sector expect that the sector will be ready for trading by 2020. Only a small number of respondents believe that this timeline could be brought forward to 2019 (13% of sector participants).

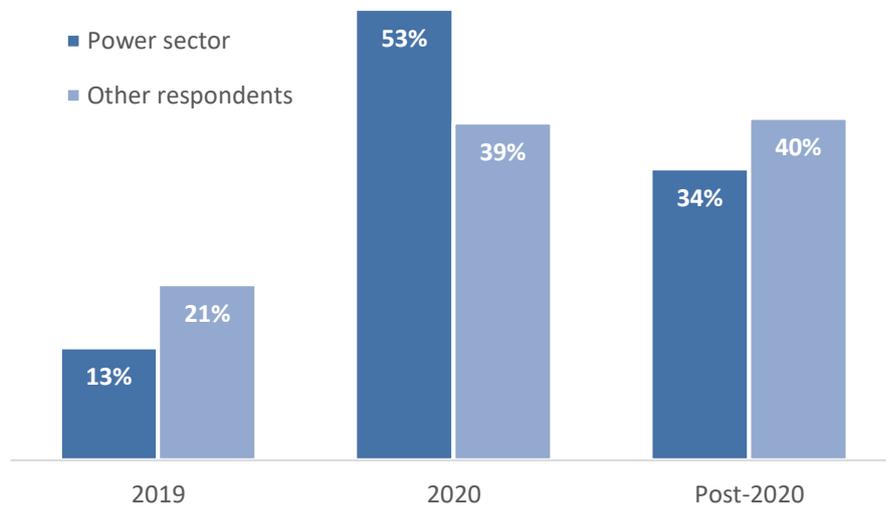


Figure 16 Q5-2: When do you think that the power sector will be ready for trading? (N=266)

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, while a third of respondents believe that they will have a surplus of allowances to sell.

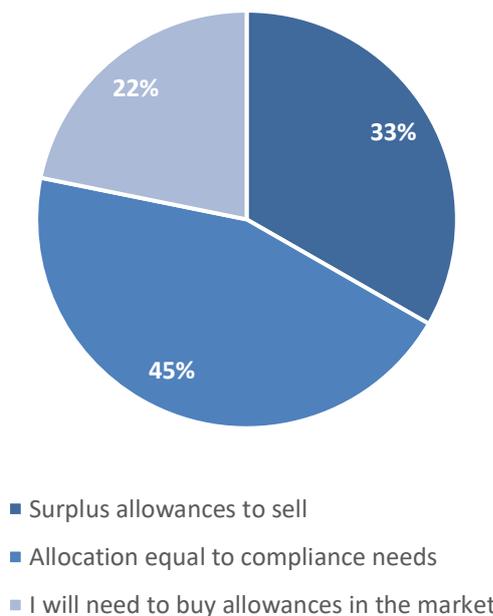


Figure 17 Q3-3: How do you expect your company's situation to be in the test phase of the national ETS regarding allowance allocation? (N=78)

Respondents were asked by what time they expect the national ETS to affect the price of electricity for consumers.

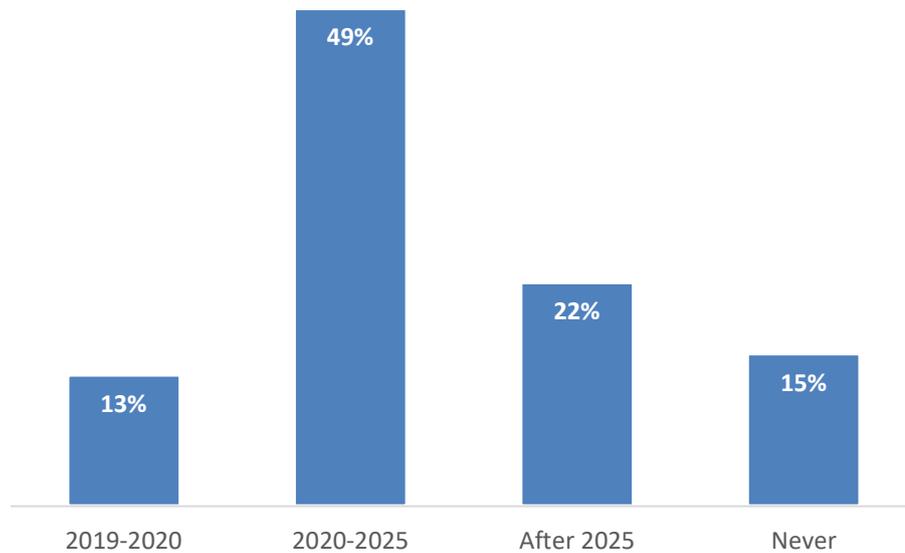


Figure 18 Q3-2: In your opinion, by when do you think the carbon price will affect the price of electricity?

When asked which sectors (if any) they expect to be ready to join the national ETS by 2020, the majority of respondents identified the cement sector, while small numbers pointed to the petrochemicals, aluminium, chemicals, aviation, ferrous metals and paper making sectors. 16% believe no other sectors will be ready to join by then.

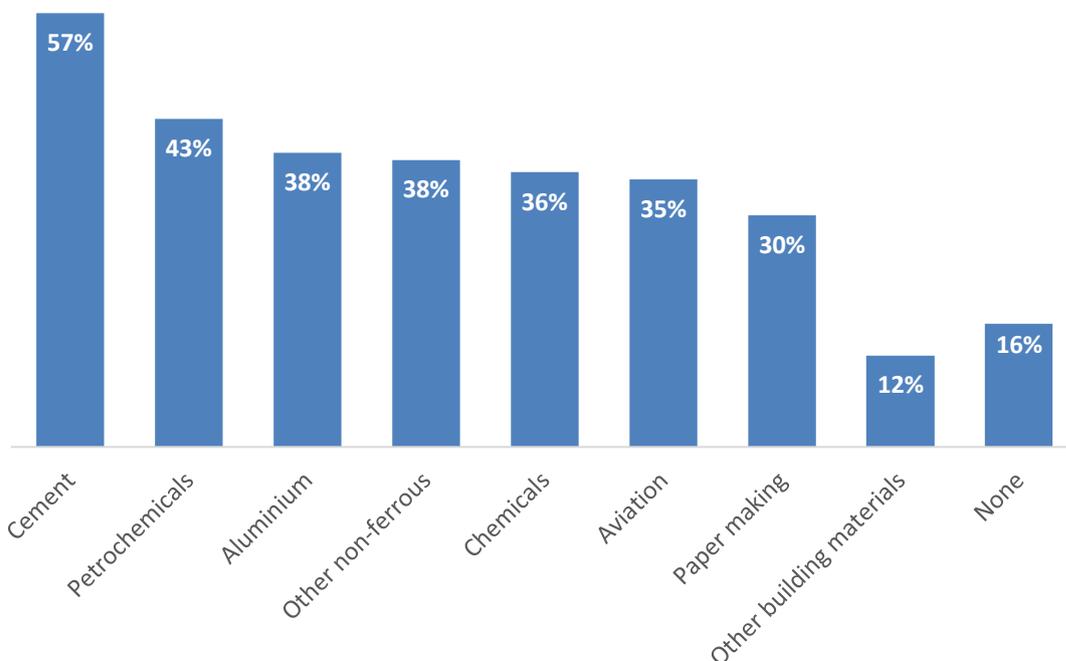


Figure 19 Q5-3: Do you think the following sectors will be ready to join the national system by the end of 2020? (N=317)

## Management of the national ETS

A majority of respondents (55%) believe that the legal basis for the national ETS should be a law passed by the National People’s Congress. Others (39%) believe that regulation by State Council would be sufficient, and very few believe regulation at the ministry level (5%) or a ministry-issued notice (1%) would suffice. Non-industry respondents were significantly more inclined towards national legislation than covered industry (64% and 44% respectively).

### ***A strong legal basis is required for the national ETS***

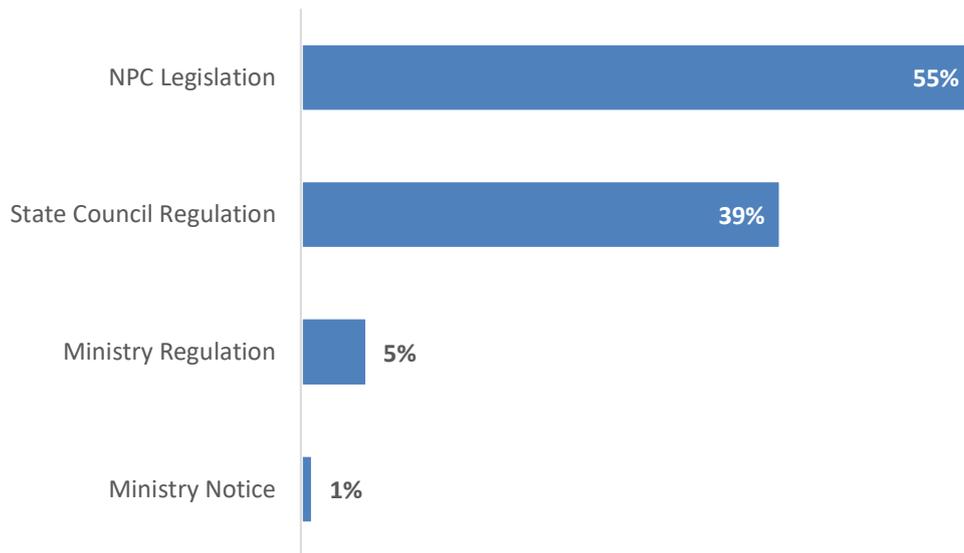


Figure 20 Q5-4 What legal basis do you think is necessary for the start of the national ETS in order to ensure compliance? (N=298)

Respondents identified ‘consequences for non-compliance’ as the most important element of legislation/regulation.

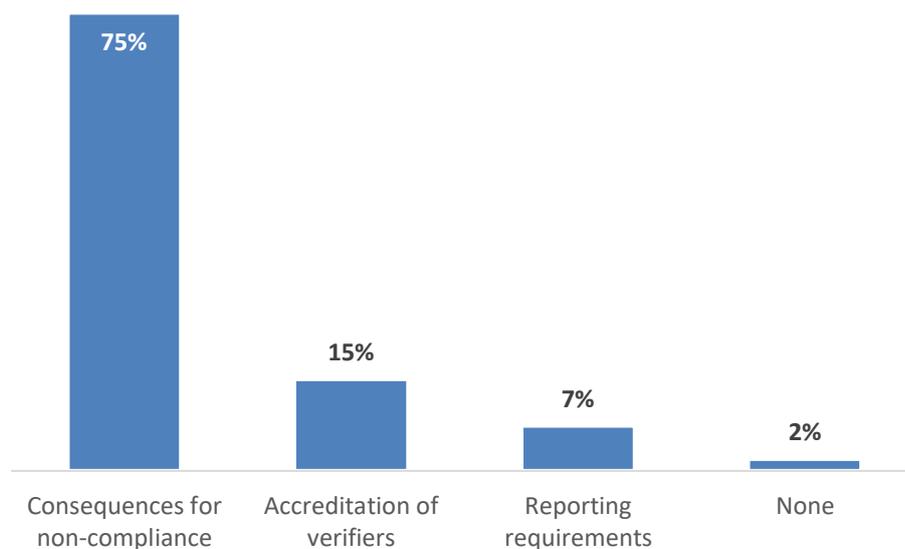


Figure 21 Q5-5: What elements of legislation are required for effective operation of the market?

Respondents were asked about the level of penalty or incentive structure would be strong enough to ensure a high percentage of compliance. While heavy fines were 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.

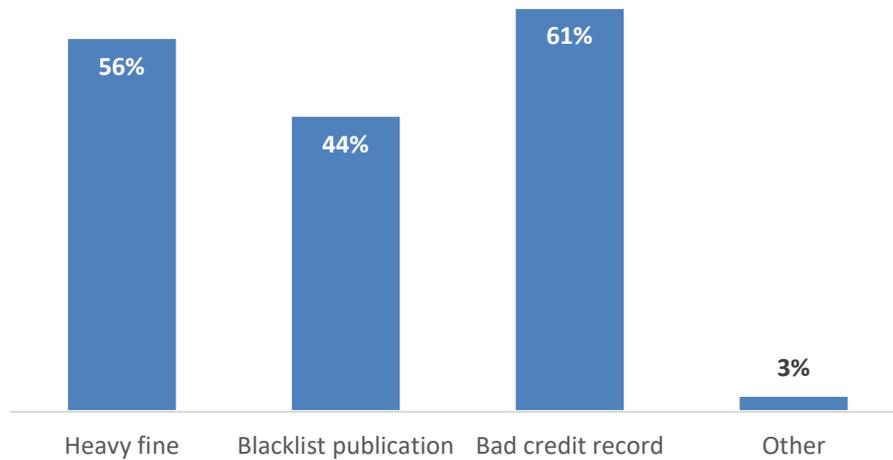


Figure 22 Q5-6: What level of penalty/incentive structure would be strong enough to ensure a high percentage of compliance?

The majority of the respondents (74%) believe that some level of banking of permits from the pilot systems to the national ETS should be allowed.<sup>7</sup> Respondents expect that companies will be able to transfer assets from the pilots into the national system without totally losing their value. As compared to last year's survey, a larger share of respondents preferred no banking of pilot allowances (27%, up from 11%).

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

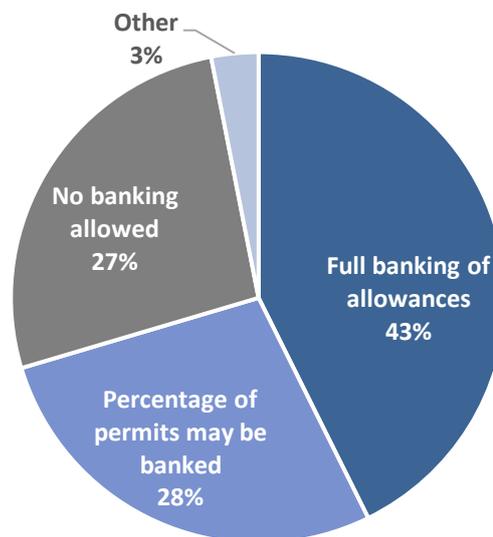


Figure 23 Q5-7 How should banking of permits from the pilot systems to the national ETS be managed? (N=260)

<sup>7</sup> Banking means the holding of permits from one compliance period for the purpose of sale or surrender in a future compliance period.

**Selected quotes: How should banking of permits from the pilot systems to the national ETS be managed? Explain your answer:**

- Pilots have different standards from the national ETS. According to the pilot standards, there may be a surplus, this may not be the case for the national system. Therefore, the calculation should be conducted in accordance with a unified standard for the whole country. – *Beijing power sector respondent*
- From the perspective of enterprises, only the central government can implement appropriate control measures. If there is not clear regulation why should enterprises focus on compliance? There needs to be clarity. (Full banking) – *African-based non-covered entity*
- The final decision in different pilots should depend on the actual situation in each. (Percentage of permits banked) – *Shaanxi non-covered entity*
- Full banking will provide investors with a clear signal, otherwise there will be a situation where the carbon price falls like at the end of the first phase of the EU ETS. (Full banking) – *Jiangsu academic*
- I suggest that allowance should not be transferred in order to avoid regional protection in pilot areas and unfair treatment of enterprises in other provinces. (No banking) – *Shaanxi non-covered entity*
- It is imperative to optimize the industrial structure and take the road towards sustainable development, but a one-size-fits-all approach is not possible. Development and reform should make steady progress. (Percentage of permits banked) – *Guangdong respondent*

The majority of industry respondents, in each of the three key sectors that we focused this year’s survey on, identified benchmarking as the most appropriate methodology for allocating allowances.

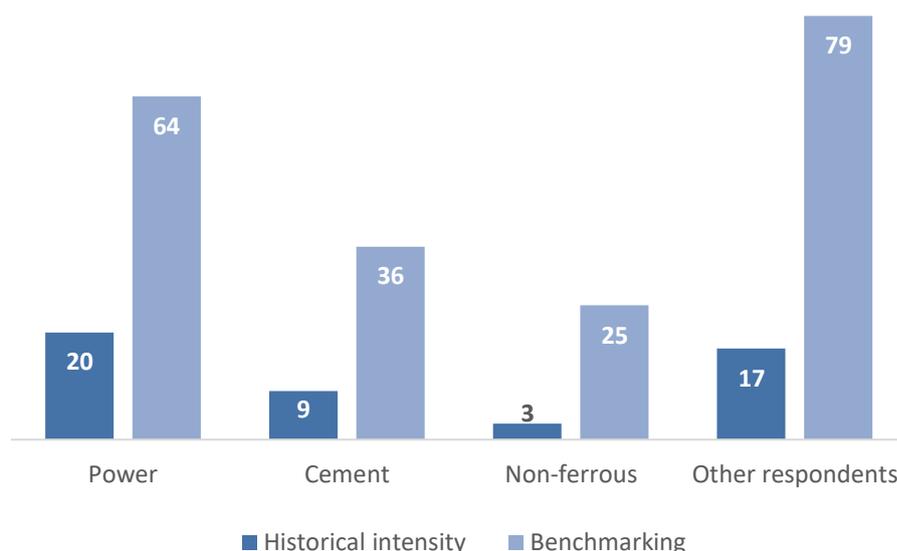


Figure 24 Q5-8: What do you think is the best method to allocate allowances?

Industry respondents were asked about their attitude towards the current draft benchmark for their sectors. The majority of respondents consider the current benchmark to be too strict.

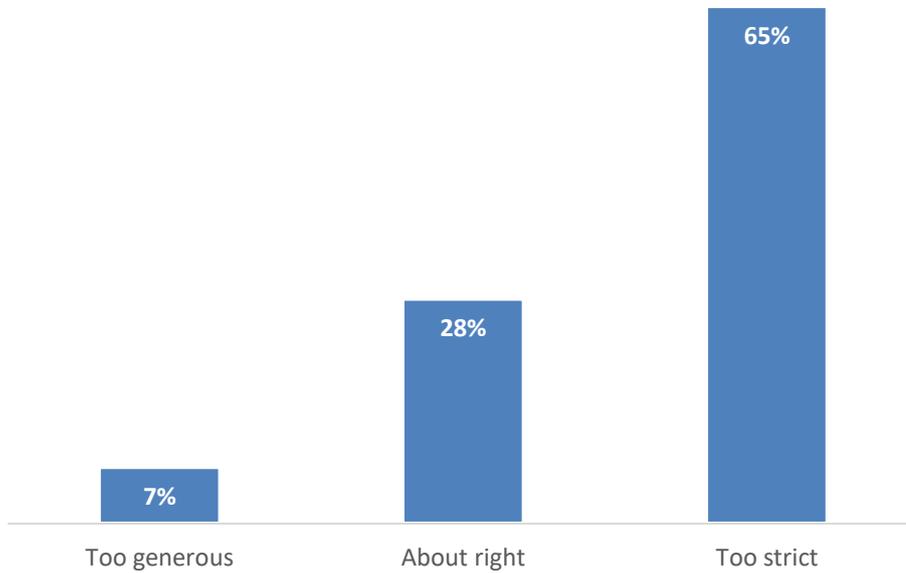


Figure 25 Q5-8: Do you think the proposed benchmark for your sector is: (N=71)

The majority of survey respondents expect that there will be auctioning covering at least 10% of the total cap by 2025.

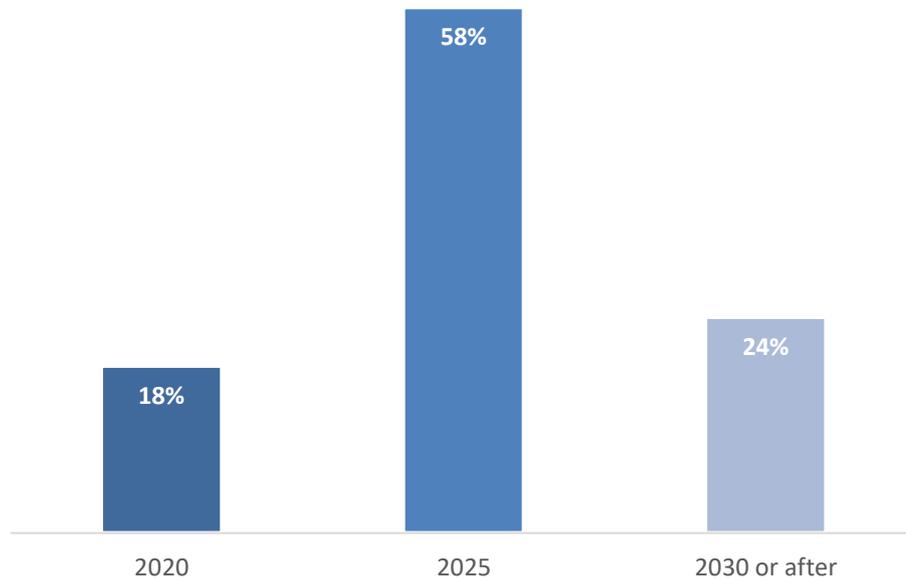


Figure 26 Q5-10: By when do you expect auctioning to cover at least 10% of the total cap? (N=261)

Almost half of respondents believe that publication of emissions data could be made mandatory by 2025.

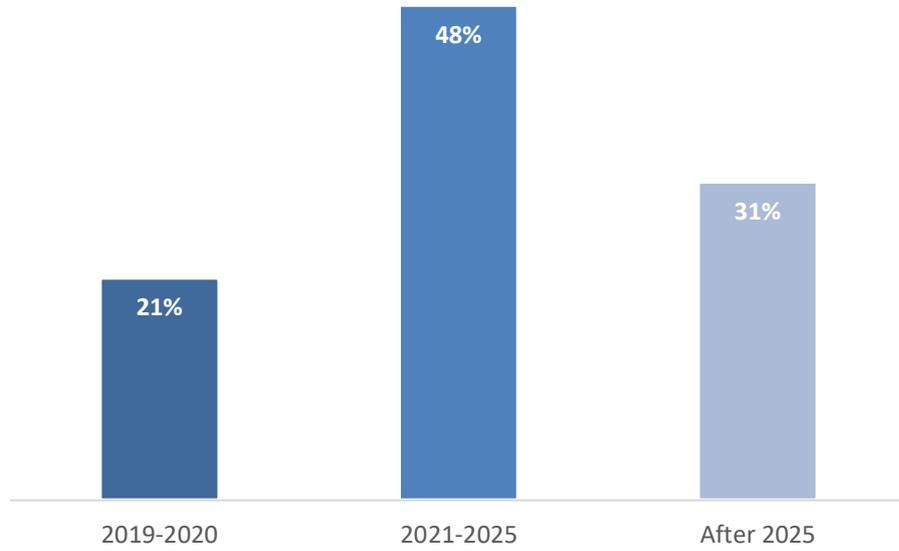


Figure 27 Q5-11: Do you think that publication of emissions data could be made mandatory by: (N=270)

Most respondents believe that non-covered entities should be able to participate in the national carbon market only after 2020.

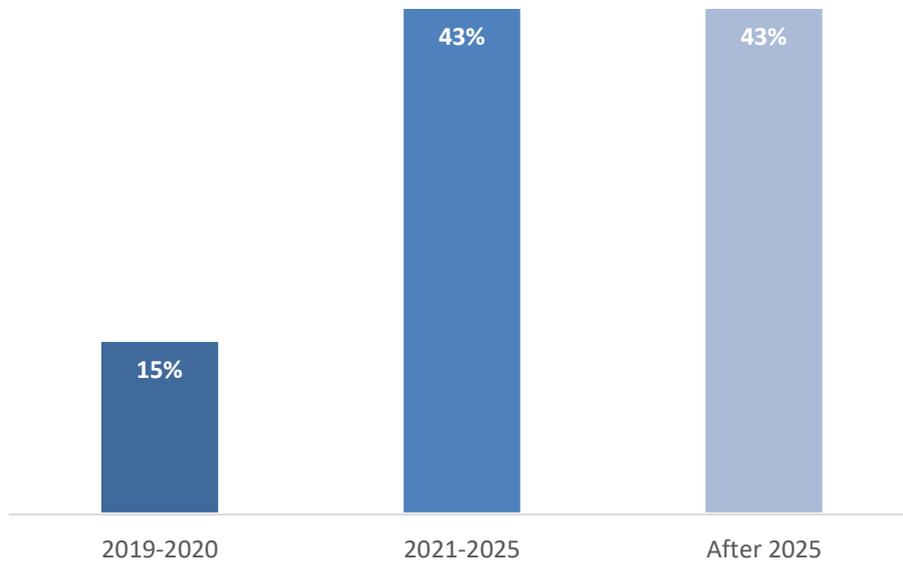


Figure 28 Q5-12: Do you think that non-covered entities should be able to participate in the national carbon market by: (N=225)

## 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 is CNY 54/t in 2020 and CNY 98/t in 2025. The price levels remain highly uncertain in the more distant future. The 20<sup>th</sup> and 80<sup>th</sup> percentiles for 2025 are CNY 35/t and CNY 158/t respectively. The future price expectations are lower than at the time of the 2017 survey. At that time, average expectations were CNY 38/t in 2017; CNY 51/t in 2018; CNY 74/t in 2020; CNY 108/t in 2025.

43% of respondents provided no price estimates (similar to previous surveys). High levels of uncertainty may lead many respondents to be reluctant to provide a quantified price expectation.

### ***China's carbon price is expected to steadily rise***

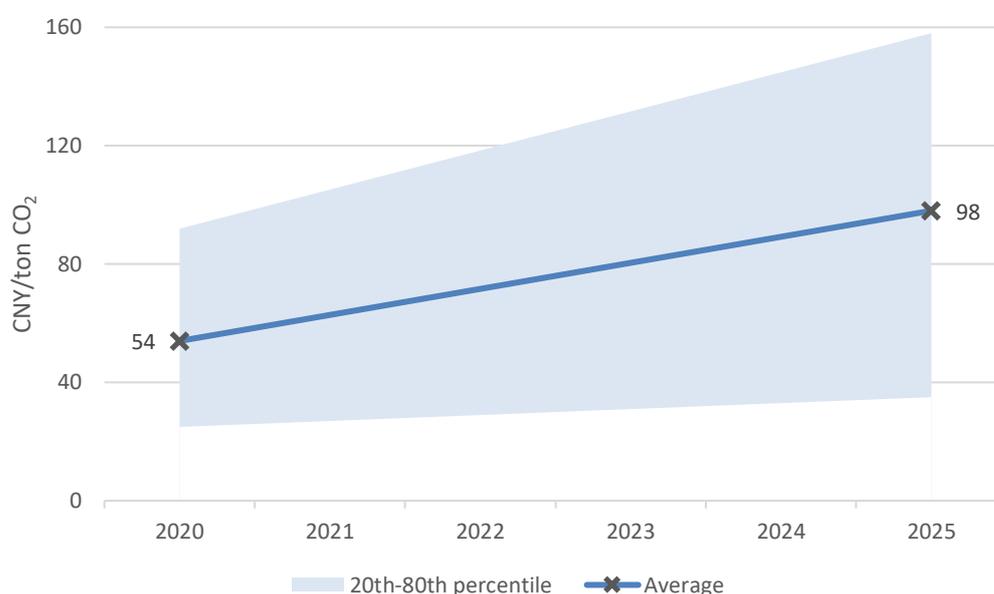


Figure 29 Q5-13 What do you expect the price in the national ETS to be in the coming years? (N=172,172)<sup>8</sup>

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. The share of free allowances versus auctioned allowances is also a key factor.

<sup>8</sup> For responses to Q5-13, the authors removed some outlying responses. 5% of responses were removed for each year. This excluded responses ranging from CNY 300-13,000 (2020), and CNY 500-15,000 (2025).

Long-term price expectations vary between industry and non-industry respondents, with industry consistently expecting lower prices. This differs from previous surveys in 2015 and 2017 when industry had higher price expectations than other stakeholders.

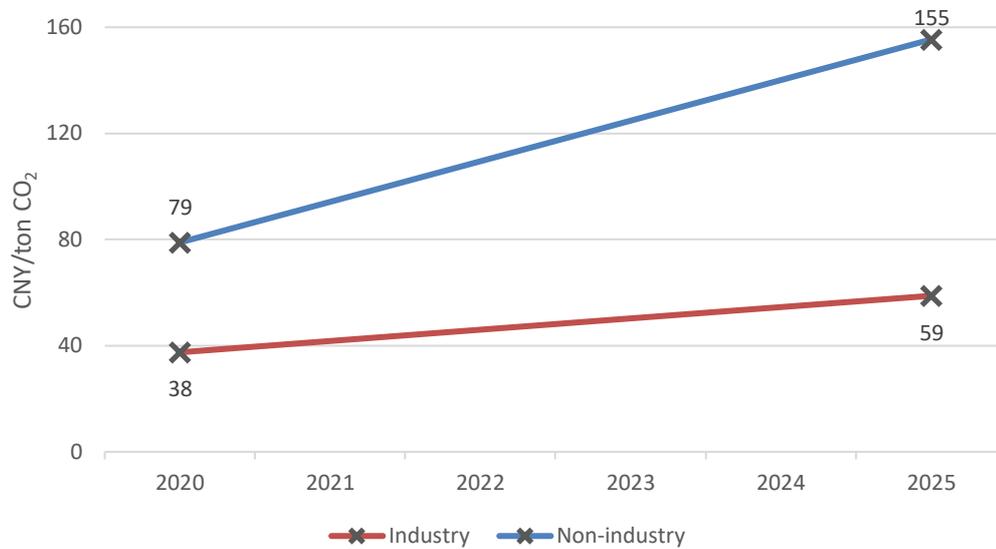


Figure 30 Q5-13 What do you expect the price in the national ETS to be in the coming years?  
Industry vs Non-industry

**Selected quotes: What do you expect the price in the national ETS to be – Explain your answer:**

- We are at a critical moment for fulfilling both domestic and international commitments. – *Guangxi trading consultant*
- The carbon price is related to the difficulty of achieving energy efficiency improvements and of investing in those improvements. I recommend that the national and local government levels provide more financial and technical support for improvement of energy efficiency. – *Shaanxi non-covered entity*
- The cost of emission reduction will increase in the future as the shortage of allowances rises. – *Beijing power sector respondent*
- After the opening of the trading market, demand will rise between 2020 and 2025, leading to a rising carbon price. – *Hebei power sector respondent*
- The price will continue to rise and then gradually stabilize. – *Beijing copper sector respondent*
- While allowances are decreasing, energy saving work in power plants will meet a bottleneck! – *Shandong power sector respondent*
- We need to take this process as a mission, avoid being timid, link all major emitters in the carbon market, encourage new industries and protect the environment. – *African-based non-covered entity*

## Readiness for emissions trading

Respondents from covered industry were asked how prepared their organisation is to take part in an ETS. Of the 159 respondents from ETS entities, carbon finance (94%) and allowance and CCER trading (78%) were outlined as the areas in which organisations were least prepared, as highlighted by respondents that selected either 'not prepared at all' or 'under consideration'.

Among respondents, there was a reasonable level of preparedness for monitoring and reporting (75%) and for allocation data collection (69%). This question on preparedness was framed differently from previous surveys, with different answer options and additional areas relating to carbon management procedures, planning and system development. As described in the introduction, it is also worth noting that this survey's sample is different than last year, due to this year's focus on three industries (power sector, cement and aluminium).

The results from this year's survey show that 9% of industry respondents are not prepared at all for 'monitoring and reporting emissions', up from 2% last year; 3% of respondents are not prepared for 'allocation data collection', down from 10%; 39% of respondents are not prepared for 'allowance and CCER trading', up from 10%; 54% of respondents are not prepared for 'carbon finance', up from 12%.

### ***More work is needed to prepare stakeholders for carbon emissions trading***

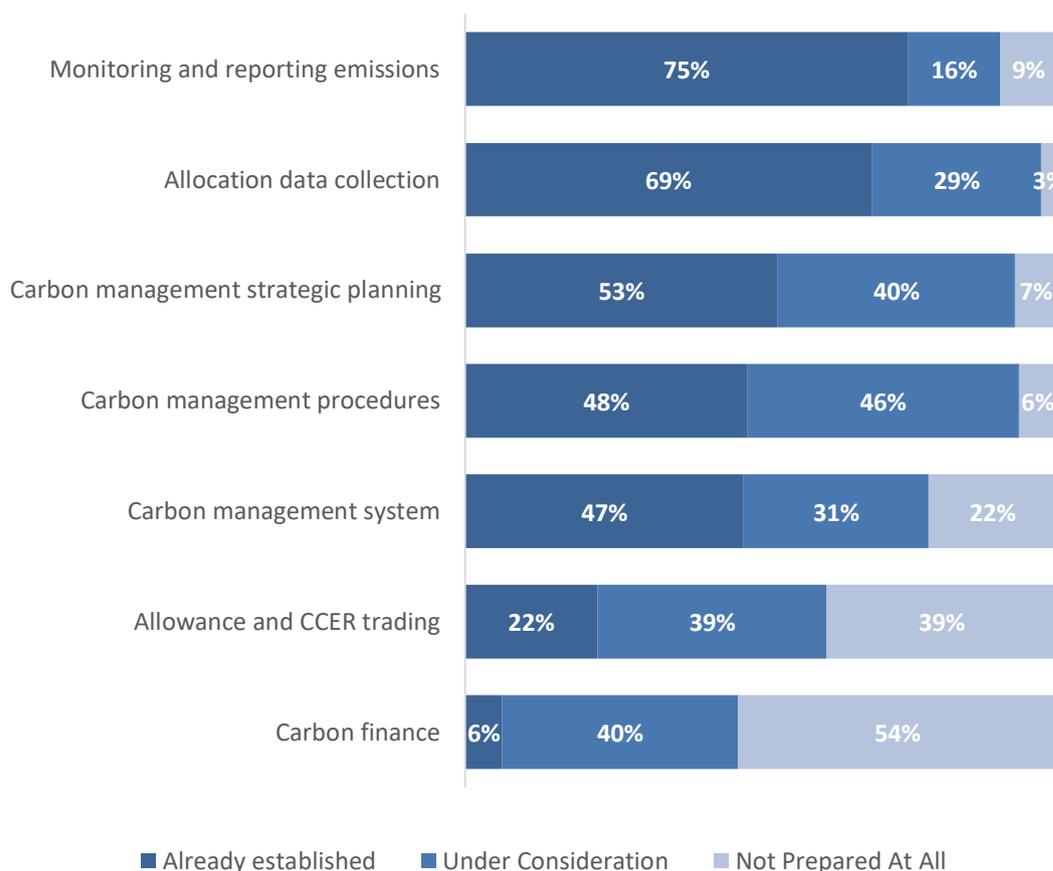


Figure 31 Q2-1 How prepared is your company to perform tasks under an ETS?  
(N=159,157,157,157,152,143)

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

While industry respondents are well established in monitoring and reporting and data collection, 36% and 32% of respondents also claimed a need for training in these areas. This suggests that even in areas where companies are best prepared, there is significant need for additional training.

**Capacity building is needed in many aspects**

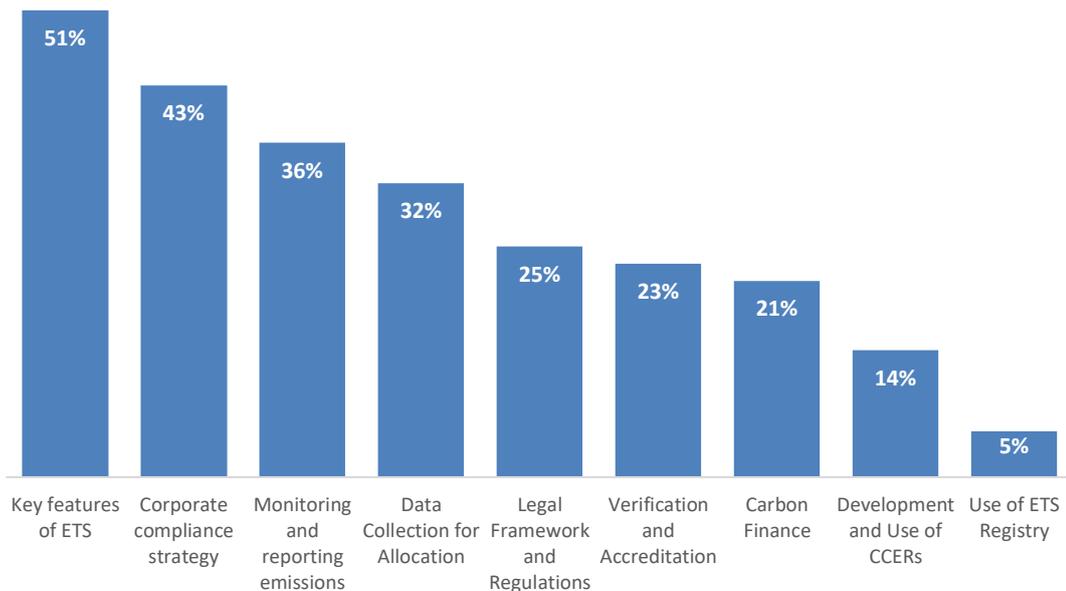


Figure 32 Q2-2 In which areas do you need to receive further training before the national ETS starts? (Select up to 3) (N=41)

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

- Currently the national-level policy is not clear or detailed. There is only a framework for the allocation methodology and the market is still under development. – *Shanxi power sector respondent*
- Policies change frequently. There are too many carbon emission-related enterprises and organizations. The standards for verification are not comprehensive. – *Shandong power sector respondent*
- We have some experience in carbon emissions verification but no experience in emissions trading. Capacity building and training activities are needed. – *Gansu power sector respondent*
- The company acts in accordance with the priorities of senior management. If the company can benefit from carbon trading, it will participate in the carbon market more actively. – *Beijing copper sector respondent*
- Doesn't this policy conflict with other government priorities? I'm unsure about the future of carbon finance. – *Jiangsu carbon finance respondent*

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

- First, policy needs to be focussed on practicality. Second, leaders at all levels of the enterprise must pay attention to this work. – *Shanxi power sector respondent*
- The extent of support for enterprises to development carbon finance. – *Jiangsu carbon finance respondent*
- Government organizing training activities and appointing third-party verifiers. – *Henan paper-making company*
- Learning the methods for preparing carbon emission reporting, as well as the relevant policies and group-level company requirements. – *Hebei power sector respondent*
- Benefit from carbon emissions reduction through the selling of allowances. – *Beijing-based petrochemicals company*

The covered industry respondents were asked whether they had formulated a dedicated team to handle ETS obligations. 42% of respondents had dedicated either an individual or a team (down from 76% last year).

**Most companies have formed a team to handle ETS obligations**

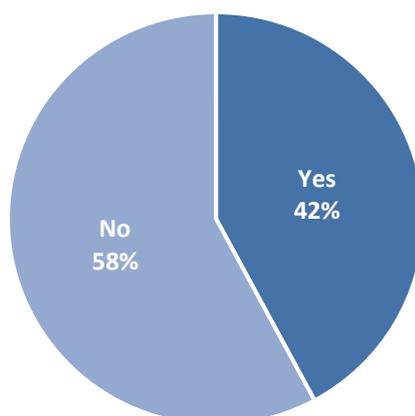


Figure 33 Q2-5a Has your company assigned a dedicated person (internal or external) or formed a dedicated team to handle your ETS obligations? (N=41)

Of these teams, most were comprised of either decision-making teams from different departments (35%) or had a dedicated department (52%). Only 12% of respondents had outsourced to an independent company.

**Companies have different approaches to ensuring compliance with ETS obligations**

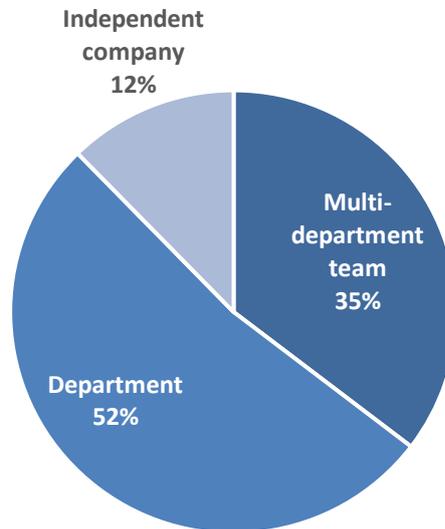


Figure 34 Q2-5b What is your team’s organizational form? (N=65)

Teams ranged in size of up to 50 persons, with the average team consisting of 8 people. 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 CDM. In addition, companies in the cement and aluminium sectors may assign people part-time to take responsibility for carbon emission management.

**Most companies have small teams to deal with ETS obligations**

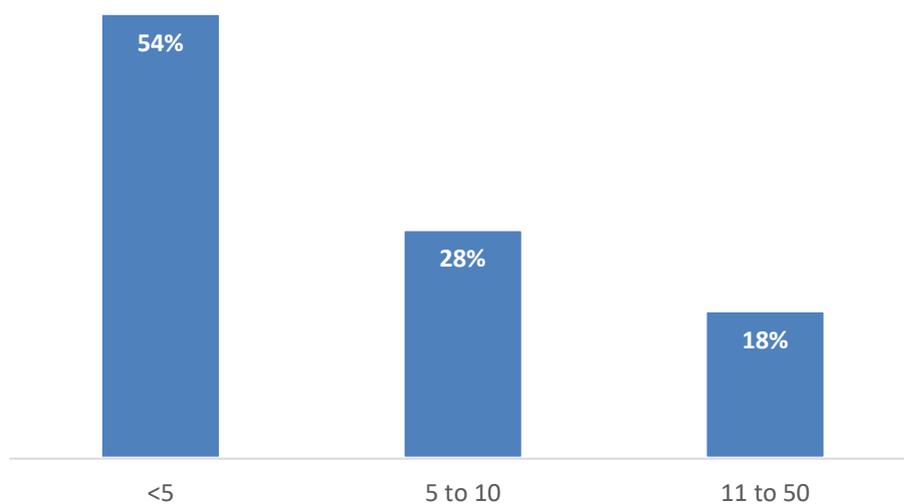


Figure 35 Q2-5c How many people are in the team? (N=62)

The involvement of management staff (46 %) in teams can be regarded as a positive feature, probably adding to the visibility and ‘profile’ of ETS compliance functions in a firm. This has been the experience internationally, especially for the EU ETS.

**ETS compliance teams include environment, energy saving and management staff**

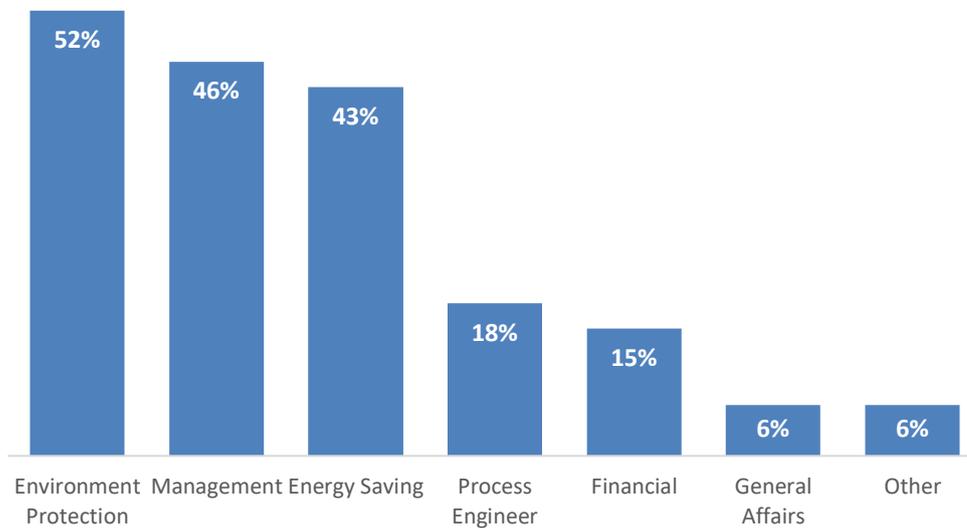


Figure 36 Q2-5d What are the competencies of the person(s) you have assigned to handle the ETS obligations? (N=67)

Of the 159 covered industry respondents, 58% of them have already participated in trainings on ETS. This is much lower than last year (80%), which can probably be attributed to the different sample (a large number of responses from the power, cement and aluminium sectors).

**A large majority of industry organisations have already participated in ETS training**

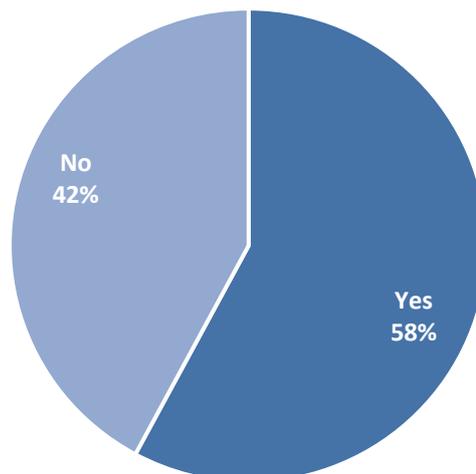


Figure 37 Q2-6 Has your company participated in training(s) on ETS? (N=159)

24% of respondents from covered or likely to be covered companies responded that their company had developed a compliance strategy for ETS in China. 'Energy efficiency measures' was the most frequently selected approach.

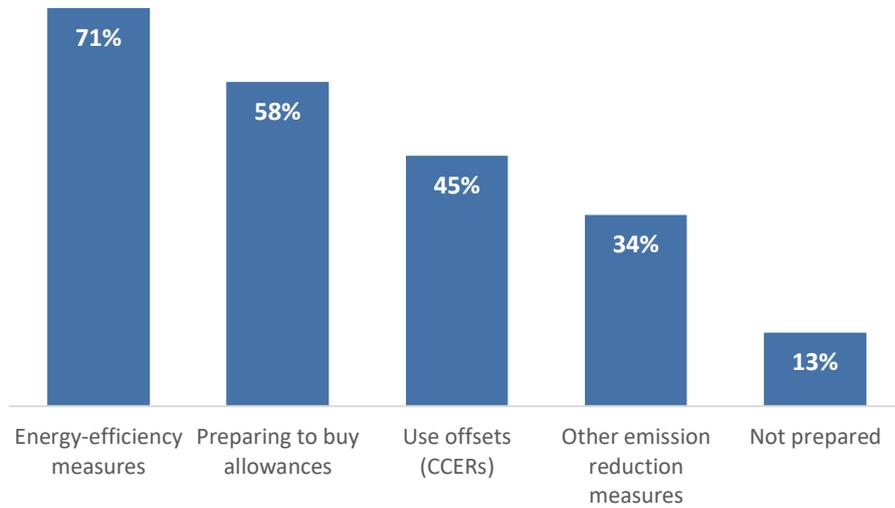


Figure 38 Q2-7: Has your company formulated a compliance strategy for ETS in China? If Yes: How do you plan to be in compliance? (N=38)

The vast majority of participants in the pilot markets (91%) believe that the transition from pilot to national ETS will require some adjustment to their strategy and/or organizational structure.

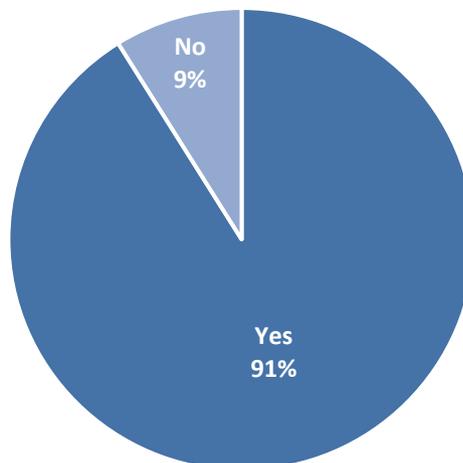


Figure 39 Q2-8: Does the transition from pilot to national ETS require some adjustment to your strategy and/or organizational structure?

Of the 159 covered companies, 72% state that their company has set an internal emission reduction target. This is similar to the response rate in 2015 and 2017, however with a higher number of responses. This is a promising result, and suggests that for many companies, ETS is used as a driver for change, and/or they want to be fully prepared for its implementation.

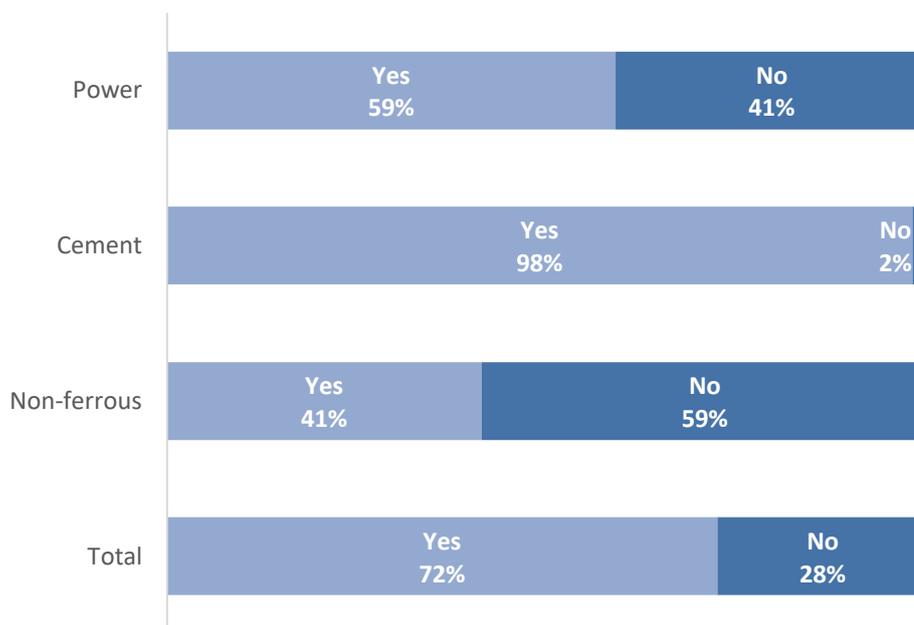


Figure 40 Q2-9: Does your company have an emissions reduction target?

One third of companies operating under the pilot systems have undertaken internal distribution of allowances between subsidiary companies, whether it be an intra-company exchange of allowances via a trading desk, or an allocation of allowances by headquarters. This is slightly lower than last year (39%), however a much lower number of responses were collected for this question this year, as the questions was only asked of 'group level' respondents this year.

Only 6% of respondents have implemented an internal/shadow carbon price, significantly lower than for the 2017 survey, again reflecting the greater representation of less prepared companies this year. Internal prices ranged up to CNY 30/ton, mirroring current spot prices.

**Selected quotes: What other preparations are needed in order to be ready for participation in the ETS?**

- Need to learn more about managing compliance risk, carbon trading and carbon finance, and to strengthen the relevant management measures. – *Beijing power sector respondent*
- Strengthen training. Senior management need to understand the relevant policy and regulation for the national ETS, and specific staff need ETS operational skills. – *Gansu power sector respondent*
- It is difficult for staff with part-time responsibilities to manage all tasks and avoid mistakes, because they can only deal with emergencies. Dedicate full-time staff are necessary. – *Heilongjiang power sector respondent*
- There are too many carbon-related organisations and we don't know which of them is professional. – *Shandong power sector respondent*

## Impacts of carbon pricing on investment

Respondents were asked if they expected the price of carbon to affect investment decisions in 2018, 2020, and 2025. Respondents expect carbon pricing to increasingly affect investment decisions in the coming years. In 2018, 34% of those who expressed a view, expect investment decisions to be strongly or moderately affected. By 2025, this number rises to 75% of respondents. 13% of respondents who answered this question expect investment decisions to be unaffected by 2025 (up from 2% last year). The responses also demonstrate a level of uncertainty for the medium-term. A breakdown of responses by the three focus industries is provided on the following page.

### ***Carbon emissions trading is expected to increasingly affect investment decisions***

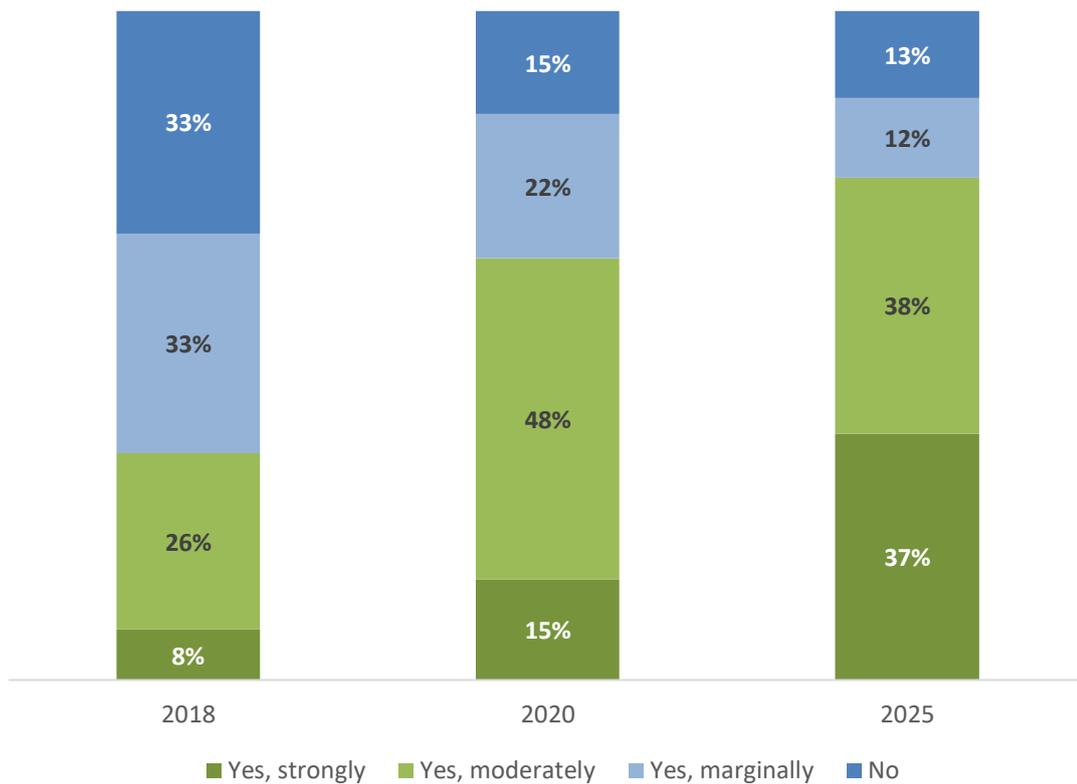
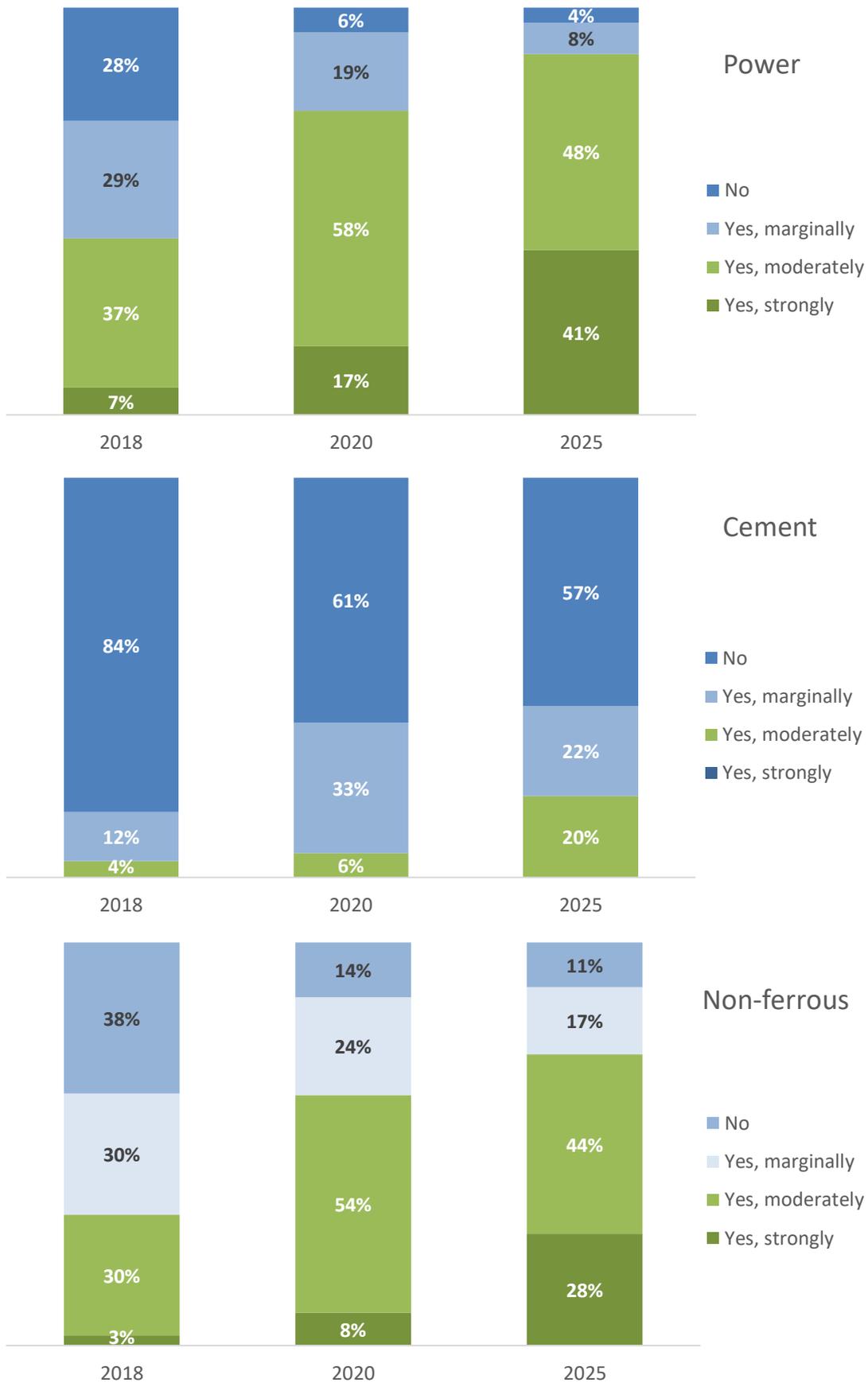


Figure 41 Q3-1 Do you expect the ETS in China to affect investment decisions in 2017? 2020? 2025? (N=304, 292, 285)

There was some substantial variation in the views of respondents from the focus sectors of power generation, cement and non-ferrous metals (see Figures 42-44 on the following page). In particular, respondents from the cement sector were far less confident of emissions trading impacting on investment decisions than other respondents. This may be partly related with the paper-based collection method for those respondents, however such significant discrepancies did not appear in other areas of the survey.



Figures 42, 43, 44 Q3-1 Do you expect the ETS in China to affect investment decisions in 2017? 2020? 2025? - Power, Cement, Non-ferrous metal sectors (N = 90, 47, 46)

**Selected quotes: Do you expect the price of carbon to affect investment decisions? Why?**

- The nationwide ETS has just begun and most companies still adopt a wait-and-see attitude. With the deepening development of the national ETS, enterprises' decisions and strategies will inevitably be affected by carbon trading by 2020 and 2025. – *Jiangsu academic*
- Currently, the carbon emission trading system is at the initial stage, so its impact on investment decisions is small. As the ETS becomes more mature, the impact will increase, but it will not be a decisive factor, because some projects are necessary. – *Jiangsu non-covered entity*
- With the country's emphasis on environmental protection and climate action, China will establish relevant policies to expand the impact of its nationwide ETS. The impact on investment decisions will be an example of this. – *Shaanxi academic*
- The carbon market has been dead for a long time. The world is watching China, but with more testing, many carbon market service companies will leave the market. Although the market has been under development for more than ten years, it is still not a real market, and there are too few participants. – *Guangdong NGO*
- The carbon market requires a gradual process to come to maturity. At present, policy has not yet provided substantial support. The stage of economic development and need for environmental protection also needs comprehensive consideration. – *Shanghai legal services respondent*
- Carbon emission trading, after all, will be carried out under the premise of economic development. With the introduction of carbon trading and people's increasing environmental awareness, carbon trading will have a certain impact on investment decisions, but it will not affect the fundamentals of economic development. – *Shaanxi non-covered entity*

## 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 (Figure 45 on the following page). 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.<sup>9</sup> 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.

Interestingly, ETS is already seen as a motivator for GHG reduction in 2018, suggesting that the policy can have a positive impact even if the carbon price signal is not yet at a high level.

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<sup>9</sup> 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.

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

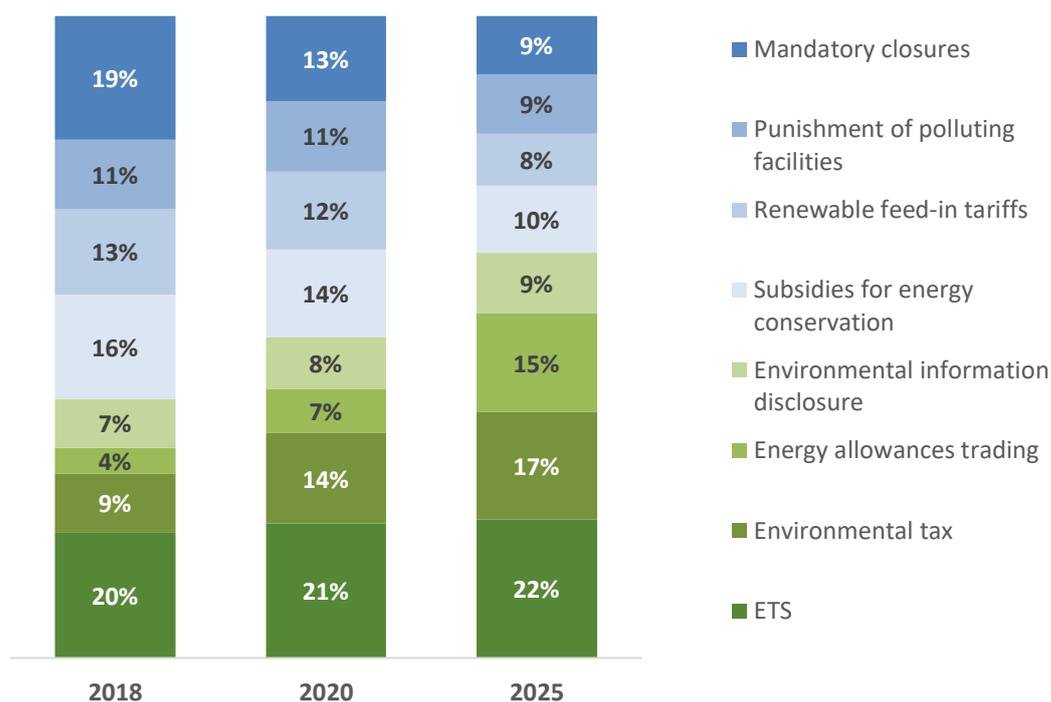


Figure 45 Q3-4 Which do you expect to be the most important policies in motivating companies to reduce GHG emissions in China at different points in time? (Select up to 3 for each year) (N=314, 295, 284)

### Peak emissions

China committed to peak its absolute greenhouse gas emissions by 2030 or earlier as part of its commitments to the Paris Agreement. 87% of respondents expect China to achieve the carbon emissions peak by 2030, and 48% expect China's emissions to peak by 2025 or earlier. Only 14% of respondents are now of the view that China's CO<sub>2</sub> emissions may peak by 2020, down from 25% last year.

#### China's emissions are expected to peak ahead of 2030

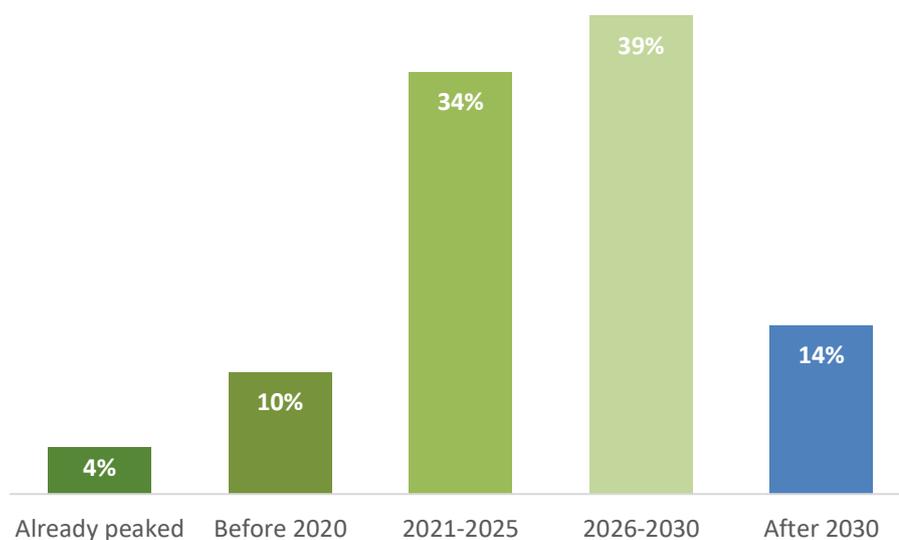


Figure 46 Q3-5 When do you expect China's emissions will peak? (N=132)

## Appendix 1: Key policies issued for the pilots in 2017-18

<b>Shenzhen</b>	<ul style="list-style-type: none"> <li>✓ The largest carbon swap contract in China was signed in Shenzhen in May 2017.</li> </ul>
<b>Beijing</b>	<ul style="list-style-type: none"> <li>✓ Beijing ETS covered 943 enterprises in 2017, while 621 were required to report the emission without obligation of compliance.</li> <li>✓ Benchmarks are applied to power generation sector, substituting previous historical emission intensity approach.</li> </ul>
<b>Shanghai</b>	<ul style="list-style-type: none"> <li>✓ The number of covered entities in 2017 has decreased from 310 to 297.</li> <li>✓ The cap of 2017 is 156 million tons.</li> <li>✓ Benchmarks for power generation sector increased, drawing close to the values of the national draft.</li> </ul>
<b>Guangdong</b>	<ul style="list-style-type: none"> <li>✓ 296 enterprises were covered in 2017 (246 existing ones and 50 new entrants), slightly higher than previous year.</li> <li>✓ The cap of 2017 is 422 million tons.</li> <li>✓ Adjustment has been seen in power generation units for comprehensive resource utilization (coal gangue, oil shale, coal-water mixture): historical method based on emission was adopted in 2016, while historical method based on emission intensity was applied in 2017.</li> </ul>
<b>Tianjin</b>	<ul style="list-style-type: none"> <li>✓ The compliance deadline has been set to June 30, 2018.</li> </ul>
<b>Hubei</b>	<ul style="list-style-type: none"> <li>✓ 344 enterprises are covered in 2017, much higher than the previous year because of change in inclusive criterion.</li> <li>✓ The cap of 2017 is 257 million tons.</li> <li>✓ Adjustment has been seen in paper making sector: historical method based on emission was adopted in 2016, while historical method based on emission intensity was applied in 2017.</li> </ul>
<b>Chongqing</b>	<ul style="list-style-type: none"> <li>✓ The total cap in 2017 is 100,448,153 tons, while in 2016 it is 100,371,810 tons.</li> </ul>
<b>Fujian</b>	<ul style="list-style-type: none"> <li>✓ In May 2017, Fujian released a plan to start pilots of forestry carbon sink in several counties. The pilots will receive policy and financial support on forestry projects development for CCER or FFCER (Fujian Forestry Certified Emission Reductions).</li> <li>✓ In February 2018, Haixia Equity Exchange issued the rules for management of carbon assets.</li> </ul>

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

## Appendix 2: CCER registration and issuance status

As of April 30<sup>th</sup>, 2018, 2,871 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 publically 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<sub>2</sub>e), and 98 are Type III (30.3 million tCO<sub>2</sub>e).<sup>10</sup> 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 <sub>2</sub> e	12.5	13.4	2.7	6.3	52.9

Table A-2 Publicly detailed CCER projects, as of September 30<sup>th</sup> 2017.

<sup>10</sup> 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.

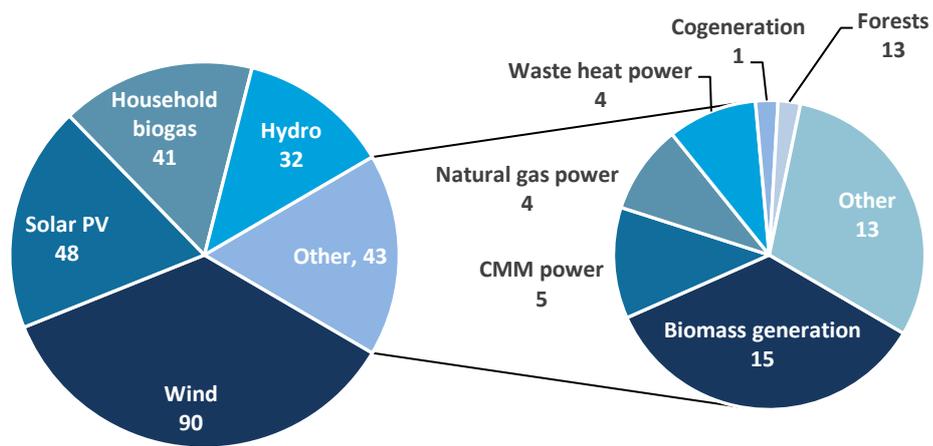


Figure A-2 CCER projects by type (number of projects issued)

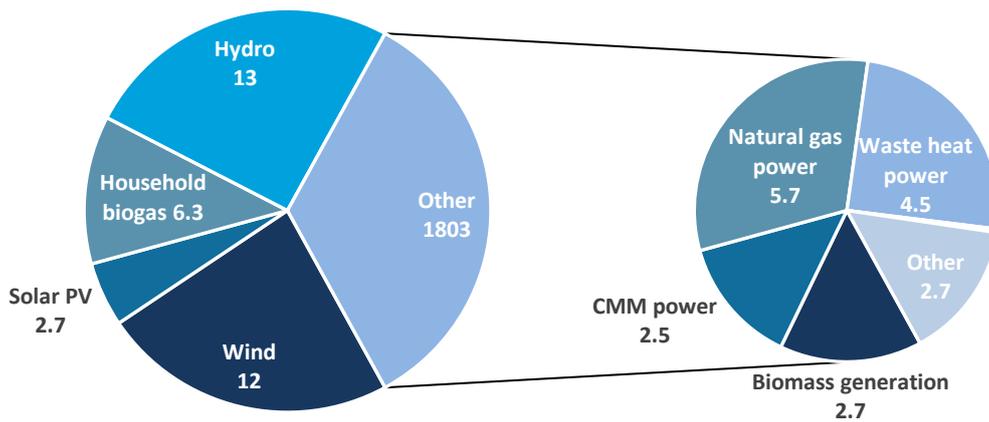


Figure A-4 CCER trading volume (million tons)

## Appendix 3: Survey questions and aggregated responses

### Section 1: Respondents' background

This first part of the survey aims to identify respondents' profile.

Q1-1: Where is your organization located?

	Responses	Percentage
In mainland China	310	98%
Outside of mainland China	7	2%

Q1-2: How would you classify your organization?

	Responses	Percentage
Covered or likely to be covered entity	159	50.2%
Non-covered entity	55	17.4%
Consultancy	31	9.8%
Academia	19	6.0%
Finance	10	3.2%
Local Government	9	2.8%
Government Research Institutes	8	2.5%
NGO	6	1.9%
Exchange	4	1.3%
Sector Associations	3	0.9%
Other	13	4.1%
Law	1	0.3%

Q1-2a: For Covered Entities: Please select your industry:

	Responses	Percentage*
Power	84	26.5%
Cement	49	15.5%
Aluminium	18	5.7%
Copper	3	0.9%
Petrochemicals	3	0.9%
Other	0	0.0%
Aviation	1	0.3%
Paper	1	0.3%

\*Percentage of total responses (N=317)

Q1-2b: What kind of consulting services do you provide?

	Responses	Percentage
Consulting	20	64.5%
Verification	4	12.9%
Trading	3	0.7%
Other	4	12.9%

For "Other" include: electricity sales, new energy.

Remaining questions in this section are for “covered entities”:

Q1-3: For Covered Entities: Please select the category:

	Responses	Percentage
Central State-owned	87	54.7%
Local State-owned	36	22.6%
Private	24	15.1%
Foreign investment	3	1.9%
Joint venture	2	1.3%
Other	7	4.4%

Q1-4: Which level do you work on?

	Responses	Percentage
Factory / Power Plant	95	60.1%
Group	63	39.9%

Q1-5: In the management structure of your company, what position do you hold?

	Covered entities	Total
Senior executive	46	46
Mid-level manager	32	45
General staff	77	101
Other	3	3

Q1-6: What is the annual energy consumption level of your company in China? (tons standard coal equivalent)

	Responses	Percentage
Below 5,000	34	17.3%
5,000-10,000	13	6.6%
10,000-100,000	63	32.0%
100,000-1,000,000	37	18.8%
Above 1,000,000	50	25.3%

Q1-7: Will your company be involved in the China ETS?

	Responses	Percentage
Yes	95	59.7%
No	54	34.0%
Don't know	10	6.3%

Q1-8: Is your company currently operating under an emissions trading system in China?

	Responses	Percentage
Yes	45	28.3%
No	114	71.7%

IF YES: Which of the following?

	Responses	Percentage
Beijing	18	25%
Shanghai	14	19.5%
Hubei	11	15.3%
Guangdong	8	11.1%
Chongqing	7	9.7%
Tianjin	6	8.4%
Fujian	4	5.5%
Shenzhen	4	5.5%

Q1-9: Is your company currently operating under an emissions trading system outside of China?

	Responses	Percentage
Yes	8	5.0%
No	151	95.0%

IF YES: Which of the following?

	Responses	Percentage
EU ETS	7	87.5%
California	1	12.5%

Q1-10: For Aluminium industry: Does your company run your own coal plant?

	Covered	Non-covered	Total
Yes	4	2	6
No	14	16	30

**Section 2: Current capacity and level of readiness** [only for industry respondents]

This section aims to understand the current capacity and the level of readiness of companies to take part in an emissions trading system.

Q2-1: Do you think that your company is prepared to perform tasks under an ETS in the following areas?

	Already established	Under Consideration	Not Prepared at All	Don't Know
Monitoring and reporting emissions	74.8%	15.7%	9.4%	9.4%
Allocation data collection	68.8%	28.7%	2.5%	2.5%
Carbon management strategic planning	52.9%	40.1%	7.0%	7.0%
Carbon management procedures	47.8%	45.9%	6.4%	6.4%
Carbon management system	47.1%	31.2%	21.7%	21.7%
Allowance and CCER trading	22.4%	38.8%	38.8%	38.8%
Carbon finance	6.3%	39.9%	53.8%	53.8%

Q2-2: In which areas do you need to receive further training? (Choose up to 3 areas you would like to receive trainings before the national ETS starts)

	Responses	Percentage*
Key Features of ETS	81	50.9%
Corporate Compliance Strategy	68	42.8%
Monitoring and Reporting Emissions	58	36.5%
Data Collection for Allocation	51	32.1%
Legal Framework and Regulations	40	25.2%
Verification and Accreditation	37	23.3%
Carbon Finance	34	21.4%
Development and Use of CCERs	22	13.8%
Use of ETS Registry	8	5.0%

\*Share of total respondents, not of options chosen, as some respondents chose multiple options.

Q2-3: Are there specific issues, which have prevented your company from developing sufficient capacity to-date? [open field]

Selection of answers provided on page 27 above.

Q2-4: For the areas where you company is fully prepared, what are the key factors that have helped you achieve this readiness? [open field]

Selection of answers provided on page 28 above.

Q2-5: Has your company assigned a dedicated person (internal or external) or formed a dedicated team to handle your ETS obligations?

	Responses	Percentage
Yes	67	42.1%
No	92	57.9%

If YES: How many people are in the team?

	Responses	Percentage
<5	33	54.1%
5 to 10	17	27.9%
11 to 50	11	18.0%
>50	0	-

If YES: What is your team's organizational form?

	Responses	Percentage
Multi-department team	23	35.4%
Department	34	52.3%
Independent company	8	12.3%

If YES: What are the competencies of the person(s) you have assigned to handle the ETS obligations?

	Responses	Percentage*
Environment Protection	35	52.2%
Management	31	46.3%
Energy Saving	29	43.3%
Process Engineer	12	17.9%
Financial	10	14.9%
General Affairs	4	6.0%
Other	4	6.0%

\*Share of total respondents, not of options chosen, as some respondents chose multiple options.

Q2-6: Has your company participated in training(s) on ETS?

	Responses	Percentage
Yes	92	57.9%
No	67	42.1%

If YES: Which department/level represented your company in the training(s)?

Answers included: Environmental Protection Department, Production Management Department; Production and Operation Department; Safety Department; Marketing Department, Business Department; Group Headquarters; Business Planning Department; Equipment Department; qualified staff; all departments.

If YES: From which agency did your company receive training?

Answers included: Development and Reform Commission (National/Provincial/City level, inc. Beijing, Gansu, Yunnan, Zhejiang, Inner Mongolia, Hubei, Tianjin, Jiangsu, Henan, Jiangxi, and Ningbo); Climate Change Department; National Centre for Climate Change Strategy and Cooperation; China Hubei Emission Exchange; Shenzhen Emission Exchange; Huaneng Carbon Assets (4); Datang Carbon Assets; SinoCarbon; State Power Investment; and China Nonferrous Metals Association.

Q2-7: Has your company formulated a compliance strategy for ETS in China?

	Responses	Percentage
Yes	38	24%
No	121	76%

If YES: How do you plan to be in compliance? (Select one or more)

	Responses	Percentage*
Energy-efficiency measures	27	71%
Preparing to buy allowances	22	58%
Use offsets (CCERs)	17	45%
Other emission reduction measures	13	34%
Not prepared	5	13%
Don't know	4	11%
Other	2	5%

\*Share of total respondents, not of options chosen, as some respondents chose multiple options.

Other includes: Deploy the allowances within the corporation group; exchange the allowances in the name of the corporation group together.

Q2-8: Does the transition from pilot to national ETS require some adjustment to your strategy and/or organizational structure?

	Responses	Percentage
Yes	41	91.1%
No	4	8.9%

If YES: If so, how?

- Organize special department to deal with tasks of ETS, in order to maximize the interests of the company group.
- Improve the support and centralize services.
- Set special positions of full-time staff.
- Make the department of production and environment protection to deal with tasks of ETS

Q2-9: Do your company have an emissions reduction target?

	Responses	Percentage
Yes	115	72.3%
No	44	27.7%

Q2-10: Has your company undertaken internal distribution of allowances between subsidiary companies?

	Total	Pilot entities
No	14	7
Yes, intra-company exchange of allowances via a trading desk	10	8
Yes, re-allocation of allowances by headquarters	6	4
Don't know	43	1

Q2-11: Do you have an internal/ shadow carbon price?

	Responses	Percentage
Yes	10	6.3%
No	149	93.7%

If YES: What value is it? (Yuan per ton)

Answers include: 20 (1); 24 (1); 30 (2); Close to the subsidy price for renewable energy (1).

Q2-12: What are other preparations are needed in order to be ready for participation in the ETS?

Answers included: The equity of the exchange; Need to know emission level of each unit within the company; Human resources; Don't know which third-party is professional; Need to learn more about carbon finance; avoid the risks of non-compliance; High-level managers need to know more about policies, and operators need to know how to deal with operational tasks; Need a special department to deal with the tasks of ETS; Data collection and strategy making; Need to build or improve the internal structure to manage relevance work; Need to improve monitoring management structure; Internal regulation; training; Policy need to be clarified; Don't know which third-party is professional; Ensure the accuracy of data; Collect current data of wind power, following national policy; and, Develop CCER projects.

### Section 3: Impacts of the emission trading systems on investment decisions

This section seeks to understand the impacts of the emissions trading systems on investment decisions.

Q3-1: Do you expect the ETS in China to affect your company's investment decisions in 2018? In 2020? In 2025?

	2018	2020	2025
No	33.2%	15.4%	13.0%
Yes, marginally	32.9%	21.6%	11.9%
Yes, moderately	26.3%	47.9%	38.2%
Yes, strongly	7.6%	15.1%	36.8%

Q3-2: In your opinion, by when do you think the carbon price will affect the price of electricity?

	Responses	Percentage
2019-2020	37	13.1%
2020-2025	140	49.4%
After 2025	63	22.3%
Never	43	15.2%
Don't know	34	-

Q3-3: [only for power sector] How do you expect your company's situation to be in the test phase of the national ETS regarding allowance allocation?

	Responses	Percentage
Surplus allowances to sell	26	33.3%
Allocation equal to compliance needs	35	44.9%
I will need to buy allowances in the market	17	21.8%
Don't know	12	-

Q3-4: Which do you expect to be the most important policies in motivating companies to reduce GHG emissions in China at different points in time?

	2018	2020	2025
ETS	149	155	154
Subsidies for energy conservation	124	101	75
Renewable feed-in tariffs	102	90	58
Mandatory closures	147	98	65
Punishment of polluting facilities	82	81	66
Environmental tax	70	104	120
Environmental information disclosure	57	60	67
Energy allowances trading	31	51	110

Q3-5: When do you expect China's carbon emissions will peak?

	Responses	Percentage
Already peaked	5	3.8%
Before 2020	13	9.8%
2021-2025	45	34.1%
2026-2030	51	38.6%
After 2030	18	13.6%

#### Section 4: prices in the pilot systems

This section covers questions about current carbon prices levels and price expectations in the pilots.

Q4-1: How do the current prices in ETS pilots compare with your expectations?

	Responses	Percentage
Actual prices are higher than what I expected	46	23.1%
Actual prices are similar to what I expected	56	28.1%
Actual prices are lower than what I expected	97	48.8%
Don't know	79	-

Q4-2: In your opinion, what are the main factors influencing prices in the ETS pilots? (Select one or more)

	Total	% Respondents*
Cap setting/allocation	212	78.8%
Government regulation/intervention	171	63.6%
Energy demand	87	32.3%
Information transparency	78	29.0%
Uncertainty affecting demand	76	28.3%
Compliance period	65	24.2%
Speculation	58	21.6%
Economic growth rate	56	20.8%
Hedging price risk	36	13.4%
Other	7	2.6%
Don't know	10	3.7%

\*Share of total respondents, not of options chosen, as some respondents chose multiple options.

“Other” included: most of trading occurred between relevance industries, not much active; Price mechanism; the barrier of offset mechanism; capacity of verification organizations.

Q4-3: What do you expect the highest and lowest prices in the pilot regions to be in the coming years?

	2018	2020	2025
Ave-Lowest	23.2	42.1	68.2
Ave-Highest	50.2	82.6	122.2
Lowest (20%-80%)	10-35	20-50	25-100
Highest (20%-80%)	25-65	38-100	50-200
Responses	135	130	131

## Section 5: The national ETS

This section covers questions about expectations on design and price in the future national ETS.

Q5-1: By when do you expect China national ETS to be fully functional?

	Responses	Percentage
2019-2020	55	19%
2021-2025	158	53%
Later than 2025	65	22%
Never	18	6%
Don't know	21	-

Q5-2: When do you think that the power sector will be ready for trading?

	Total	Power	Other
2019	48	12	36
2020	117	48	69
Post-2020	101	31	70
Don't know	50	4	46

Q5-3: Do you think the following sectors will be ready to join the national system by the end of 2020?  
(Choosing more than one option is allowed)

	Responses	Percentage*
Cement	180	56.8%
Petrochemicals	136	42.9%
Aluminium	122	38.5%
Other non-ferrous	119	37.5%
Chemicals	114	36.0%
Aviation	111	35.0%
Paper making	96	30.3%
Other building materials	38	12.0%
None	51	16.1%

\*Share of total respondents, not of options chosen, as some respondents chose multiple options.

Q5-4: What legal basis do you think is necessary for the start of the national ETS in order to ensure compliance?

	Responses	Percentage
NPC Legislation	163	54.7%
State Council Regulation	116	38.9%
Ministry Regulation	16	5.4%
Ministry Notice	3	1.0%
Don't know	19	-

Q5-5: What elements of legislation are required for effective operation of the market?

	Responses	Percentage
Consequences for non-compliance	224	75.4%
Accreditation of verifiers	45	15.2%
Reporting requirements	22	7.4%
None	6	2.0%
Don't know	20	-

Q5-6: What level of penalty/incentive structure would be strong enough to ensure a high percentage of compliance? (Choosing more than one option is allowed)

	Responses	Percentage*
Heavy fine	173	56.2%
Blacklist publication	137	44.5%
Bad credit record	187	60.7%
Other	8	2.6%
Don't know	9	2.8%

\*Share of total respondents, not of options chosen, as some respondents chose multiple options.

“Other” include: loss of government contracts.

Q5-7: How should banking of permits from the pilot systems to the national ETS be managed?

	Responses	Percentage
Full banking of allowances	111	42.7%
Percentage of permits may be banked	72	27.7%
No banking allowed	69	26.5%
Other	8	3.1%
Don't know	57	-

Selection of answers provided on page 21 above.

Q5-8a: Do you think the proposed benchmark for your sector is:

	Responses	Percentage
Too generous	5	7%
About right	20	28%
Too strict	46	65%
Don't know	19	-

Q5-8b: What do you think is the best method to allocate allowances in your sector?

	Responses	Percentage
Historical intensity	49	19.4%
Benchmarking	204	80.6%
Don't know	64	-

Q5-10: By when do you expect auctioning to cover at least 10% of the total cap?

	Responses	Percentage
2020	48	18.4%
2025	151	57.9%
2030 or after	62	23.7%
Don't know	55	-

Q5-11: Do you think that publication of emissions data could be made mandatory by:

	Responses	Percentage
2019-2020	58	21.5%
2021-2025	129	47.8%
After 2025	83	30.7%
Don't know	46	-

Q5-12: Do you think that non-covered entities should be able to participate in the national carbon market by:

	Responses	Percentage
2019-2020	33	14.6%
2021-2025	96	42.7%
After 2025	96	42.7%
Don't know	42	-

Q5-13: What do you expect the price in the national ETS to be in the coming years?

	2020	2025
Average	50.75	86.40
20th perc.	25	35
80th perc.	92	158

## 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 U.K., China, Belgium, India, Singapore 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.

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).

Tsinghua University China Carbon Market Center (CCMC) focuses on both international and China's domestic carbon market research and development. The Department of Climate Change of China's National Development and Reform Commission (NDRC), China's emissions trading authority, provided strong support for the establishment of CCMC, with the expectation that CCMC will play a critical role in the establishment of China's national emissions trading system through providing technical and policy advice.

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 therefore ample experience to support China in its efforts to set up a ETS.



## Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

GIZ has been working on behalf of the German Government for almost 40 years to support China in its reform and openness policy. This work serves the interest of both countries and reflects China's changed role in the world. The German Government's projects and programmes are embedded in the wide-ranging strategic partnership between China and Germany.

As a part of the work on climate change, the Sino-German Project "Capacity Building for Emissions Trading Schemes (ETS) in China" is jointly implemented by GIZ on behalf of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) and by the Ministry of Ecology and Environment (MEE). The project is executed within the framework of the International Climate Initiative (IKI).

The project's objective is to strengthen the capacity of Chinese policy makers and key stakeholders for the establishment and operation of ETS at local and national level. This includes methodological, technical, and policy advice on ETS design, infrastructure and operation, while a focus is placed on the exchange of experiences and know-how between Chinese, German and European institutions.



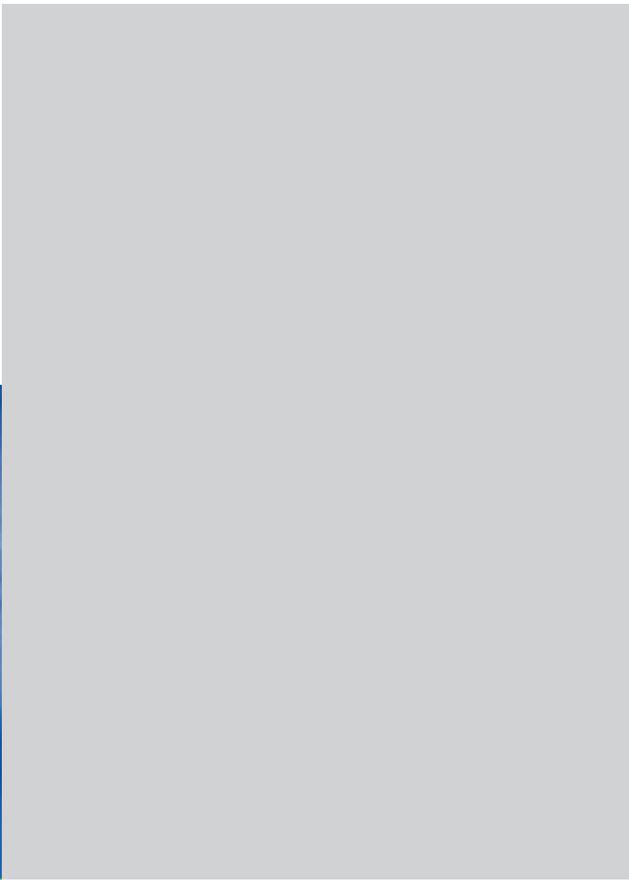
Energy Foundation Beijing Representative Office (Energy Foundation China), established in Beijing in 1999, is a grantmaking charity organization dedicated to China's sustainable energy development. As part of the U.S.-based Energy Foundation, it is registered under the Beijing Municipal Public Security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

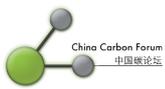
Energy Foundation China, previously known as the China Sustainable Energy Program, was initiated with funding from the David and Lucile Packard Foundation and the William and Flora Hewlett Foundation. Over the years, Energy Foundation China has achieved steady growth, with our pool of funders growing. 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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