

2022

CHINA CARBON PRICING SURVEY



2023.07

Abstract

This report summarises the results of the 2022 China Carbon Pricing Survey. The survey elicited expectations about the future of China's carbon pricing policies from stakeholders in carbon markets in China during October and November 2022. Through cooperation with industrial associations, the project team reached a wide range of representatives from China's carbon-intensive industries which are already subject to or are soon expected to be subject to carbon pricing, in particular the power sector which was the first to be covered by China's national carbon emissions trading market. The cement sector and the iron and steel sector stand out in terms of those perceived as the next most ready for coverage by the national carbon market, with the weighted average being that those two sectors will have joined by 2024. Over 40% of power sector respondents expect that their company will need to buy allowances in the market to meet their compliance needs for the second period. The survey results give strong confidence that carbon price levels in China will rise over time, and that carbon pricing will increasingly affect investment decisions. There is strong confidence that China will peak its carbon emissions before 2030, as pledged by President Xi Jinping in September 2020.

Keywords

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

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The survey implementation and project management were supported substantially by Jessica Jia, ICF. China Carbon Forum (CCF) initiated the survey in 2013, together with Professor Frank Jotzo at Australian National University, and managed the implementation of each subsequent survey up until 2020. The support of CCF's General Manager Peter Edwards has been invaluable over a number of years and the authors are grateful for it.

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Acronyms:

CCER	China Certified Emission Reduction
CDM	Clean Development Mechanism
CNY	Chinese Yuan
CO ₂	Carbon Dioxide
ETS	Emissions Trading System
GDP	Gross Domestic Product
GHG	Greenhouse Gases
MEE	Ministry of Ecology and Environment
MRV	Monitoring, Reporting and Verification
NDRC	National Development and Reform Commission
TCE	Tons of Coal Equivalent
tCO ₂	Tons of Carbon Dioxide

Executive Summary

The *2022 China Carbon Pricing Survey* was undertaken during October and November 2022, obtaining expectations about the experience to-date and the future of carbon pricing policies in China from 465 stakeholders. The survey does not claim to be representative, but it does provide an indication of stakeholder views about carbon pricing in China. The project builds on surveys conducted since 2013.

China's carbon market progress

Eight regional carbon markets were launched in the period of 2013 to 2016. The regional markets have experimented with different allocation mechanisms, sectoral coverage, the use of offsets, and various derivative products. In 2015, shortly before the Paris Agreement was signed, China announced that it would develop a national carbon market.

The Ministry of Ecology and Environment (MEE) released regulation bringing the national carbon market into legal effect in February 2021. This document sets out details in relation to the responsibilities of different levels of government, emitting companies, and third-party verification. China's national carbon market was planned to first include the power sector, then gradually expand its coverage to other key emitting sectors. July 2021 saw the first trades take place on the Shanghai-based national carbon emissions exchange platform, starting at 48 CNY/tonne. The first compliance cycle of China's national carbon market ended on 31 December 2021. By then, the national carbon market covered 2,162 emitting enterprises from the power sector, with total annual GHG emissions of 4.5 billion tonnes.

Since the 2021 survey, several key developments occurred in the development of the national carbon market. A new draft plan for allowance allocation for 2021 and 2022 emissions was issued by the MEE in November 2022 asking for comments. It indicated that the second compliance cycle remains a two-year cycle, and power sector enterprises are required to surrender their allowances by 31 December 2023. In December 2022, the MEE issued updated guidelines for monitoring, reporting and verification (MRV) of emissions within the power sector, in order to further improve the quality of carbon emission data.

While the MEE issued a notification in November 2021 allowing use of previously issued CCERs to offset a proportion of allowances to be surrendered for compliance, a fully amended CCER regulation is still to be officially released, though this is foreseen to occur within 2023.

Respondents

The survey received 465 responses from stakeholders in relevant sectors. 84% identified as being from emitting enterprises, including at least 49% from companies already covered by either a regional carbon market or the national one. Of the emitters, the highest representation is from the power sector (38% of all respondents), followed by building materials (21%), steel (13%), chemicals (5%), non-ferrous metals and petrochemical sectors (3% each). 4% of respondents are from companies providing carbon market-related services, while 3% each came from research institutes and sectoral associations. 32% were from organizations in provinces with regional carbon markets.

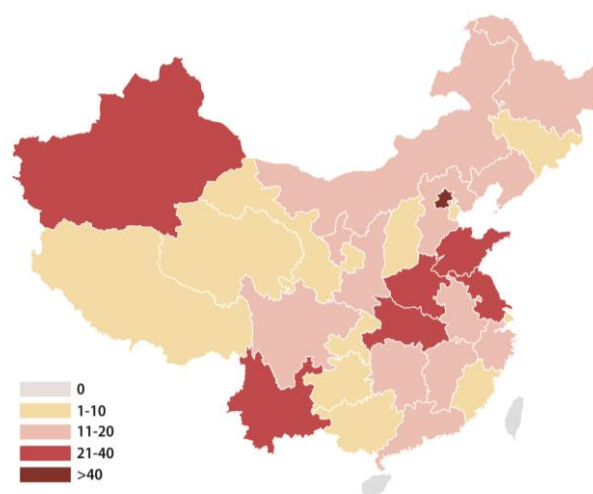


Figure i: Location of respondent organisations. n=465

China's national carbon market

Power sector respondents were asked about their company's situation during the first compliance phase of the national carbon market regarding allowance allocation. A far higher proportion of respondents now expect that their company will need to buy allowances in the market in order to meet their compliance needs, compared to last year's results for the first period (41% vs. 26%).

After power generation, the cement and the iron and steel sectors stand out in terms of perceived carbon market readiness, with over a third of respondents optimistic that they will be ready to join the national carbon market by as early as 2023, and the weighted average of expectations being that those two sectors will have joined by 2024. The other key emitting sectors are expected, on average, to join by 2025.

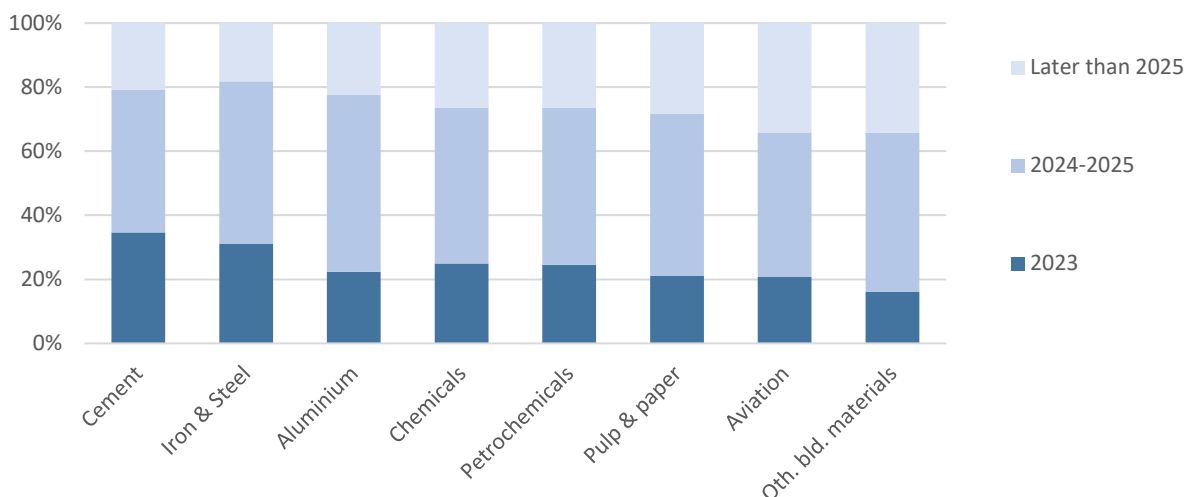


Figure ii: Which other sectors do you think will be ready to join the national carbon market?
(n=392,385,371,368,367,356,342,371)

Respondents expect the effect of carbon pricing on investment decisions to greatly increase between the time of the survey and the end of this decade. By 2025, about three quarters of respondents expect investment decisions to be at least moderately affected. Only 6% of respondents who answered this question expect investment decisions to be unaffected by 2025.

Carbon emissions trading is expected to increasingly affect investment decisions

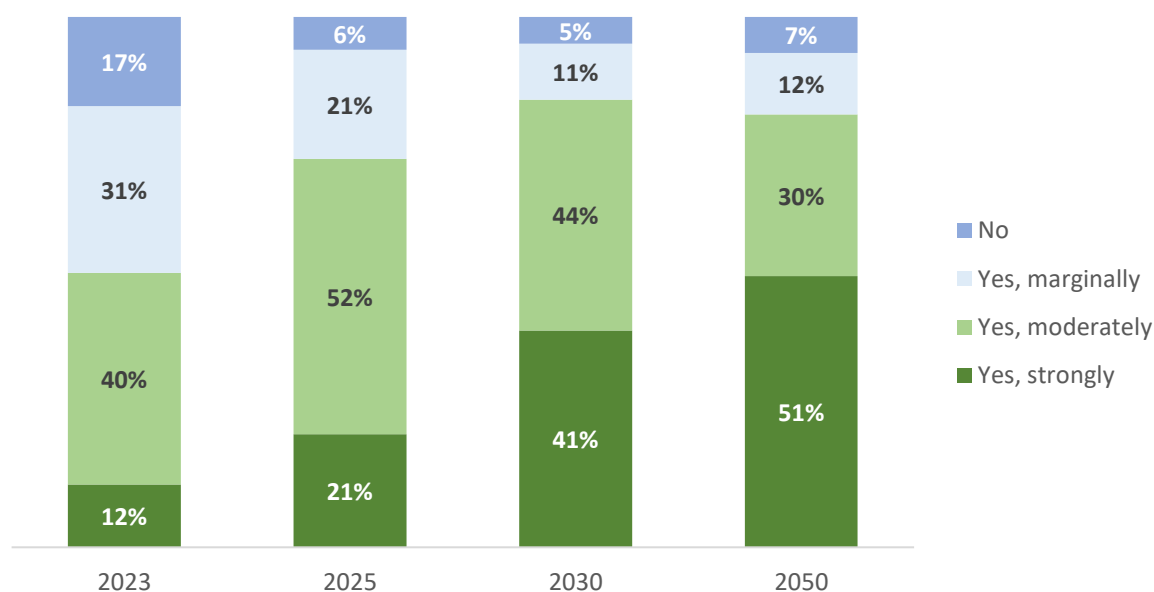


Figure iii: Do you expect the carbon market in China to affect investment decisions in 2023, 2025, 2030, 2050? (n=423,422,416,397)

Price expectations

The national carbon price is expected to rise steadily. The average price expectation in the national market is expected to be CNY 59/t in 2022, rising to CNY 87/t in 2025 and CNY 130/t by the end of the decade. While the actual price levels remain highly uncertain, the range of expectations has narrowed somewhat since last year's survey. The 20th-80th percentile range grows from CNY 49-60/t in 2022 to CNY 58-180/t in 2030. Expectations to the end of this decade are slightly lower than in last year's survey, however they remain substantially higher than previous surveys up to 2020. Future expectations may be influenced by a higher-than-expected starting price in the first compliance phase of the national carbon market. Expected prices towards the middle of the century are much lower than the average prices in the EU in the month of January 2023 (about 83 EURO or around CNY 600).

China's carbon price is expected to steadily rise

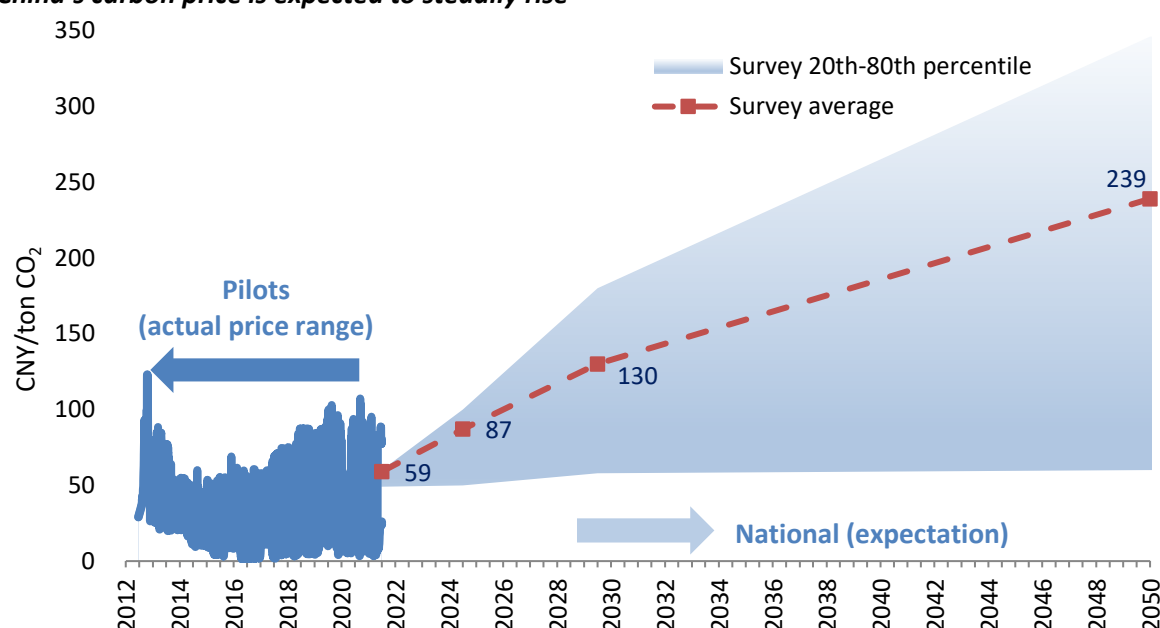


Figure iv: Range of prices in the regional systems to-date, and estimated prices for the national system.

China's emissions targets and peak emissions

In September 2020, President Xi Jinping increased China's climate ambition by committing to peak its carbon emissions 'before 2030' (up from 'around 2030'). 85% of respondents to this year's survey expect China to achieve the carbon emissions peak before, or no later than 2030. Only 13% expect China's emissions to peak by 2025 or earlier, down from 36% two years ago in the 2020 survey.

China's emissions are expected to peak before or no later than 2030

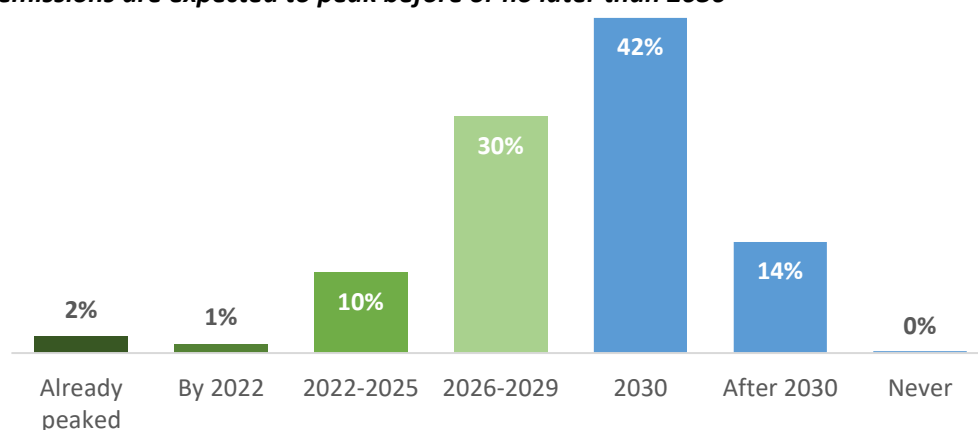


Figure v: When do you expect China's emissions will peak? (n=434)

Introduction

This report presents the results from the *2022 China Carbon Pricing Survey*. The project builds on similar surveys conducted in 2013, 2015, and annually since 2017. Many of the questions asked were the same or similar in each survey so that comparisons can be made over time. In addition, since this year's survey comes after the end of the first compliance cycle of China's national carbon market, some more questions were designed to reflect the feedback to the first compliance cycle.

When the surveys began in 2013, there was a strong indication of the Chinese central government's interest in using carbon pricing as a tool to reduce emissions, as it had begun to launch a series of seven pilot carbon markets in various regions of the country. At that time, there was also active consideration of the potential for carbon taxation to also be used.

Global interest has recently been focussed on President Xi Jinping's 2020 commitment that China will strive to achieve peak carbon dioxide emissions before 2030 and carbon neutrality by 2060. These targets come on top of the existing target to reduce the carbon intensity of the country's economy by at least 65 per cent by 2030.¹ The national carbon market has the potential to play a key role in helping China to achieve these targets.

As China's first explicit nationwide policy to directly limit carbon emissions, the start of trading in the national carbon market in July 2021 signifies that China has taken a significant step forward in the process of achieving its carbon peaking and carbon neutrality goals. More than 40% of China's carbon emissions have so far been covered by the national carbon market, adding to the real cost of carbon emissions for those enterprises. With the continuous improvement of the carbon pricing mechanism, China's carbon market is expected to grow into a large market with accumulated trading value of CNY 100 billion by 2030,² which will provide a price signal and financial support for carbon emission reduction across the economy.

The 2022 China Carbon Pricing Survey was conducted anonymously through an online survey platform, *Diaochapai*, from October 17 to November 22, 2022. Through cooperation with related industrial associations, efforts were made to survey representatives from China's carbon-intensive industries, with a special focus on the power sector, which is already subject to carbon pricing nationally. This included dissemination of the survey to the members of industry associations. The survey was also sent to participants in the 2021 survey who provided contact details. Finally, the survey was made available by the authors to potential respondents through targeted social media channels, in particular WeChat.

The survey received 465 responses from professionals in a range of sectors, including industry, market-related services and research institutes. About half (49%) of all respondents are either already covered by the national or regional emissions trading systems or expect to be covered by the national system. In addition, a further 34% of survey responses were from industry representatives that will either be covered in the future, are unsure, or do not expect to be covered by the national carbon market, and 3% were from sectoral associations, bringing the collective representation of industry views to 86% (400 responses).

¹ Carbon intensity refers to the level of carbon emissions per unit of GDP (CO₂/CNY GDP).

² Ministry of Ecology and Environment: *Gradually Expanding the Industrial Coverage of the National Carbon Market*: <http://www.zqrb.cn/finance/hongguanjingji/2022-07-22/A1658421363931.html>

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, 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.

There is no claim that the survey is representative of the views of all experts and industry on these questions, both because it is not possible to create a representative list of experts, and due to self-selection by those who chose to respond to the survey. The expectations elicited in this report are best interpreted as an aggregation of "best guesses" by a subset of people who have knowledge and informed views about the factors that will affect the operation of carbon pricing in China.

For industry respondents, the survey's sample may be biased towards market participants with a higher-than-average level of preparedness, given that less well-prepared companies may have less certainty regarding the carbon market, and therefore be less willing to complete a survey. We have sought to mitigate this effect by working with sector associations to elicit more representative industry responses. Expectations have probably also been impacted by the realisation of trading in the national carbon market and therefore a national price on carbon, at least in the power generation sector.

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

This report begins with an update on the status of carbon emissions trading in China to-date. It then outlines the key results from the survey, covering prices in the regional emissions trading systems, expectations about the national system, the voluntary carbon market and offsets, the readiness of enterprises, and the impact of carbon pricing on investment decisions. This report is intended to objectively present the opinions of respondents as a reference for policymakers and market participants.

Update on carbon emissions trading in China

Carbon markets are a policy tool adopted by China's government to promote the reduction of greenhouse gas emissions and accelerate the clean energy transition. Since mid-2013, China has seen the successive introduction of eight regional pilot carbon markets in Beijing, Chongqing, Hubei, Guangdong, Shanghai, Shenzhen, Tianjin, and Fujian, providing valuable experience for the central government to put in place a national carbon pricing mechanism.

Since the pilot carbon markets were launched in 2013 and 2014, most have matured substantially, have introduced measures to improve liquidity and considered whether and how to expand the scope of their system. Prices in the pilot markets have varied substantially since the initiation of the markets, and daily prices are displayed in Figure 1 below.

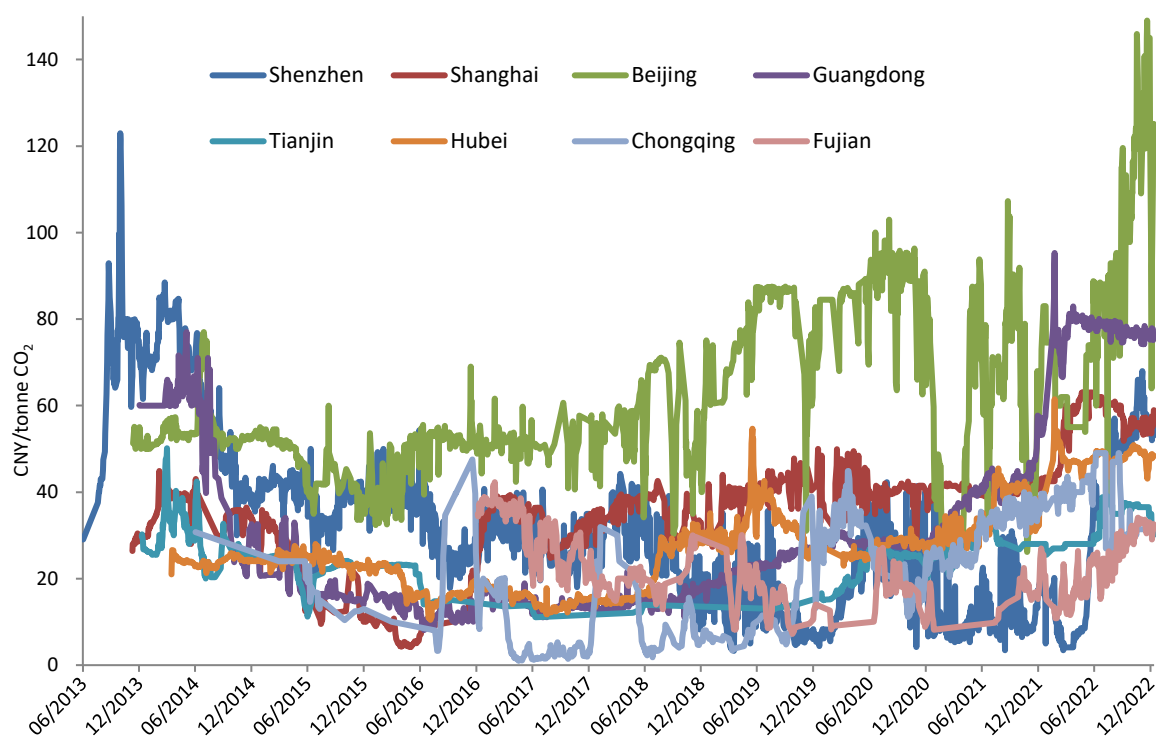


Figure 1: Daily closing price of online trading (CNY/tonne), June 2013 – December 2022.

Source: SinoCarbon; VCarbon.

In 2017, the National Development and Reform Commission of China (NDRC) issued the *Development Plan for the National Carbon Emissions Trading Market (Power Sector)* (hereinafter referred to as the “National Carbon Market Development Plan”). The national carbon market has so far involved trading between covered entities in the power sector, and is planned to gradually expand its coverage to other key emitting sectors. According to the National Carbon Market Development Plan, the development of China's national carbon market would follow a “three-step” approach: a basic infrastructure establishment stage, a simulated operation stage, and a stage for improvement and market maturation.

China systematically restructured government ministries under the State Council in 2018. Since then, the responsibility for developing the national carbon market shifted to the Ministry of Ecology and Environment (MEE).

From October to December 2019, the MEE organised 17 large-scaled training activities and allowance allocation trials across mainland China, aiming to further enhance the capacity of enterprises from the power sector in carbon market day-to-day tasks and simulate the allowance allocation programme to test the reasonableness of the allowances allocated to each emitting enterprise under the allocation programme so as to avoid any market risk.

On 31 December 2020, the Ministry of Ecology and Environment (MEE) issued *Trial Measures for the Administration of Carbon Emissions Trading*³ (hereafter “*Administration Measures*”), and subsequently also issued a series of rules for covered entities in the power sector to register and interact with the national registry systems, based in Hubei and Shanghai respectively.⁴

Trading in China’s national carbon market was officially launched on 16 July 2021, marking a new milestone for the establishment of China’s carbon emissions trading market, i.e. the third phase of the government’s plan for the national market. The trading started at CNY 48, very close to the average value (CNY 49) expected by respondents for the opening price in the *2020 China Carbon Pricing Survey*.

The first compliance cycle of China’s national market came to an end on 31 December 2021, achieving a performance completion rate of 99.5%. By this point, the national market had run for 114 trading days and recorded 179 million tonnes in cumulative trading volume and CNY 7.7 billion in value of traded carbon emission allowances.



Figure 2: Daily online trading price in the national carbon market. Source: SinoCarbon; VCarbon.

³ *Trial Measures for the Administration of Carbon Emissions Trading*:

https://www.mee.gov.cn/xxgk2018/xxgk/xxgk02/202101/t20210105_816131.html

⁴ The *Rules on Carbon Trading Registration Management (trial)*, the *Rules on Carbon Trading Management (trial)*, and the *Rules on Carbon Trading Settlement Management (trial)* were released by MEE in May 2021:

http://www.mee.gov.cn/xxgk2018/xxgk/xxgk01/202105/t20210519_833574.html

From 4 January to 30 December 2022 (the last trading day of 2022), the annual cumulative volume of allowance transactions in China's national carbon market was almost 51 million tonnes, and the annual cumulative turnover was over 2.8 billion CNY.

Since last year's survey, several key developments occurred in the development of the national carbon market. For example, in March 2022, the MEE emphasised that accurate and reliable data is the "lifeline" for an effective and regulated operation of the national carbon market, and required the strengthening of supervision and management of carbon emission data quality to ensure the smooth and healthy operation of the national market.

The MEE requested provincial authorities to organise emitting enterprises from the power sector and seven other key emitting sectors to account for and submit their GHG emission reports for the year 2021, which would form the basis of data for allowance allocation when these sectors are included in the national carbon market in the future. Enterprises from the power sector were required to disclose their verified GHG emissions information in the first compliance cycle of the national carbon market no later than the end of March 2022. Moreover, these enterprises also had to update their emission data quality management plan and report verified key factors related to carbon emissions accounting monthly, such as fuel consumption, elemental carbon content, low level heat content of fuel, aiming to strengthen the management of enterprises' emission data and improve the oversight of data quality going forward.

A new plan for allowance allocation for 2021 and 2022 emissions was issued by the MEE in November 2022. According to the *Implementation Plan for Allowance Cap Setting and Allocation for the National Carbon Trading Market in 2021 and 2022*, the second compliance cycle of China's national carbon market remains a two-year cycle, and the allowances will continue to be allocated for free. Enterprises from the power sector are required to surrender their allowances for the years 2021 and 2022 separately on an annual basis, with the same deadline for compliance by 31 December 2023.

It is worth noting that while some carbon trading systems with compliance obligations adopt auctioning as the main approach to allowance allocation, in China's national carbon market, free allocation is currently the only allocation method. According to the *Administration Measures*, which regulates trading in China's national carbon market and relevant activities, the allowances in China's national carbon market will be mainly free allocated, and auctioning (paid allocation) may be introduced in due course in accordance with relevant requirements by the authority.

In December 2022, the MEE issued updated guidelines for monitoring, reporting and verification (MRV) of emissions within the power sector⁵, to improve the quality of carbon emission data. These updated MRV guidelines optimise the formulas involved in carbon emissions reporting verification, improved the system for data quality control, and adjusted some factors for calculation of emissions, for example by giving more scientific and reasonable default values for carbon content per unit of heating value.

⁵ *Guidelines on Enterprise Greenhouse Gas Emission Accounting and Reporting (Power Generation Facilities)*, *Guidelines on Enterprise Greenhouse Gas Emission Verification (Power Generation Facilities)*:

https://www.mee.gov.cn/xxgk2018/xxgk/xxgk06/202212/t20221221_1008430.html

China Certified Emission Reductions (CCERs) are allowed to be used as qualified carbon offsetting credits for emitting enterprises to cover up to 5% of their carbon emission allowances to be surrendered, as defined in the *Administration Measures* of December 2020. Market stakeholders are looking forward to the return of the CCER market. Experience from the first compliance cycle shows that demand for CCERs in the national carbon market is very strong. In the first compliance cycle, around 32.73 million tonnes of CCERs were used, exceeding the total amount of the used CCERs for the period from 2012 to 2017. According to the MEE, it will strive to restart the registration of new CCER credits as soon as possible, and will support Beijing in establishing a national voluntary emissions trading centre.

The expansion of the national carbon market to more sectors is still under consideration, based on indications from the MEE, such as its work on MRV guidelines for iron and steel, aluminium, and cement sectors, and engagement with related industrial associations. However, the impact of COVID-19 and the need for economic recovery after the pandemic brings some uncertainty regarding the timing of expanding the coverage of the national market.

Survey respondents

465 eligible responses are included in the analysis. The number of respondents this year was the second highest so far, after the 2020 survey (567).

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

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

Survey respondents by groups

Of the 465 respondents, 84% of respondents identified as being from carbon emitting enterprises, including at least 49% from companies already covered by either a regional carbon market or the national one.⁶ Of the emitting enterprises, the highest representation is from the power generation sector (38% of all respondents), followed by building materials including building materials (inc. cement) (21%), steel (13%), chemicals (5%), non-ferrous metals and chemicals sectors (3% each).

4% of respondents are from companies providing carbon market-related services, including consultancy, verification, offset development and trading, while 3% each came from research institutes and sector associations. Other responses came from academia, the financial industry and government officials.

Survey respondents by group

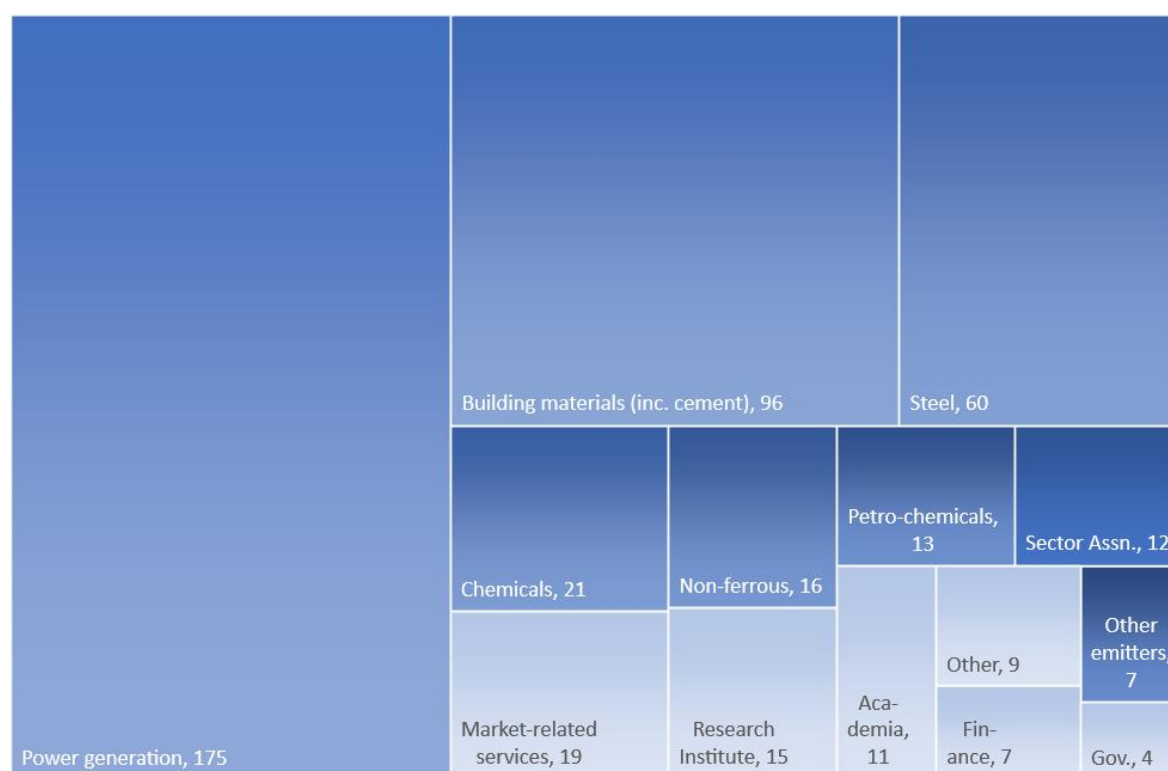


Figure 3: How would you classify your organization?
Note: total number of responses n=465.

⁶ A further 10% of respondents indicated that they did not know whether their company was already covered by a carbon market.

Responses by region

15% of the respondents to the survey are from organizations located in Beijing. 32% were from provinces with regional pilot carbon markets. Only 1 response came from organisations not based in mainland China.

The relatively high level of responses from Beijing reflects the concentration of the policymaking, consultancy and expert communities in the capital city, and also because the project partners have stronger networks in Beijing. After Beijing, the highest number of respondents were from Jiangsu, Hubei, Shandong and Xinjiang (6% each).

The geographic spread of respondents has increased with each iteration of the survey, reflecting a growing engagement in carbon markets across the country.

Survey respondents by region: increasingly widespread

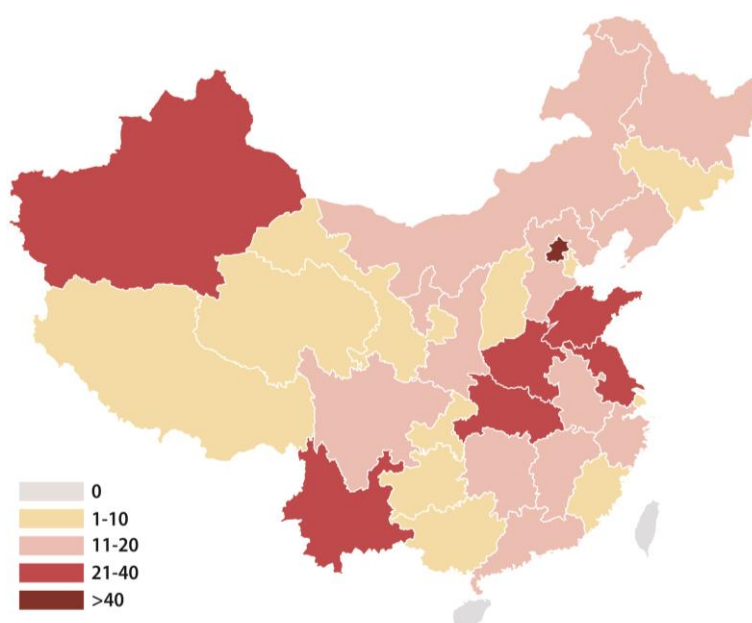


Figure 4: Location of respondent organisations (n=465)

Industry responses

The share of respondents from industrial enterprises, as well as sectoral association, has risen steadily over the years: representing 86% of this year's respondents, up from 81% in 2021, 76% in 2020, 68% in the 2018 and 2019 surveys, 29% in 2017, 23% in 2015, and 7% in 2013.

This year's survey included 229 respondents from already covered entities (pilot and national systems). Insights from respondents with practical experience in emissions trading have increased greatly since the 2021 survey, with the start of the national carbon market. The gradual maturing of the market nationally means that respondents' expectations are likely to be better informed.

29% of emitting enterprises have participated in the regional pilot emissions trading systems, with especially good representation from companies operating under the Shanghai (36) and Hubei (35) systems.

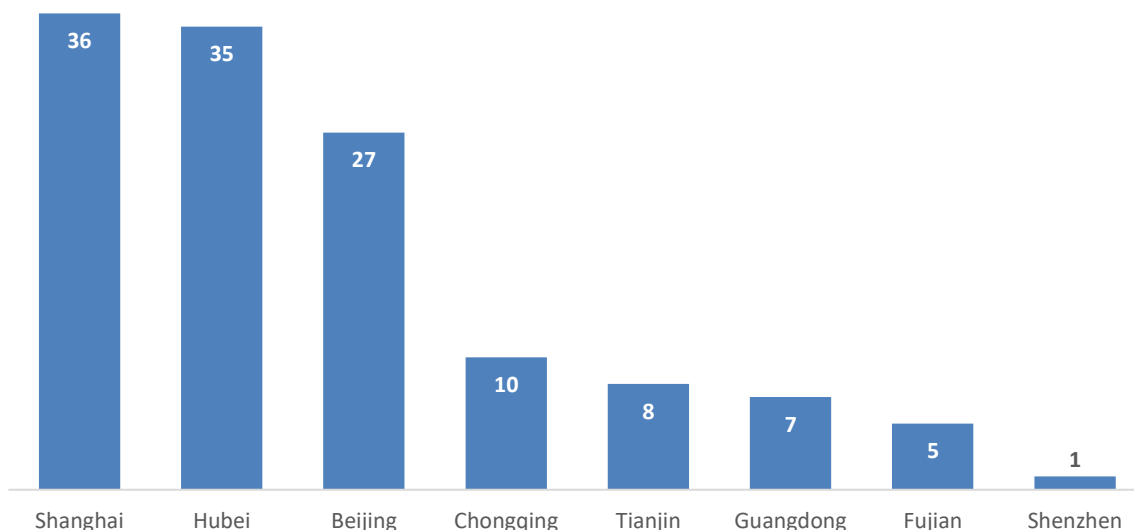


Figure 5: Is your company currently operating under an emissions trading system(s) in China? If Yes: Which of the following? (n=90)

Six industry respondents were from companies currently operating in compliance carbon markets outside of China, three of which are involved in the EU Emissions Trading System (ETS), two in the California cap-and-trade system, and one in the Kazakhstan ETS. For these companies, working under more than one carbon market jurisdiction may facilitate experience sharing, industry peer to peer learning, and eventual integration across systems.

For respondents from emitting enterprises, two thirds identified as general staff, while 26% of responses were from mid-level managers. This year's survey received 17 responses from senior manager.

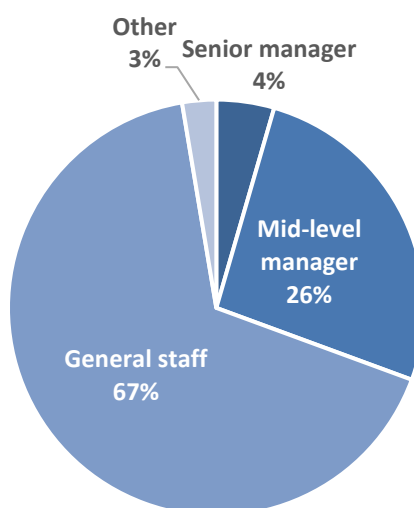


Figure 6: In the management structure of your company, what position do you hold? (n=379)

Of the responses from emitting enterprises, 52% identified themselves as belonging to central state-owned companies, with another 19% from local state-owned enterprises. 15% of respondents from emitters were from privately owned companies, and 10% were from joint ventures. 44% of the emitters were very large energy consumers, reporting energy consumption of over 1 million tce/year. 11% came from small companies with energy consumption of under 10,000 tce/year, which is the threshold for inclusion in the national carbon market. Responses from large emitters were concentrated in centrally state-owned enterprises, which tend to be among the largest emitters in China.

Industry respondents by size and ownership type

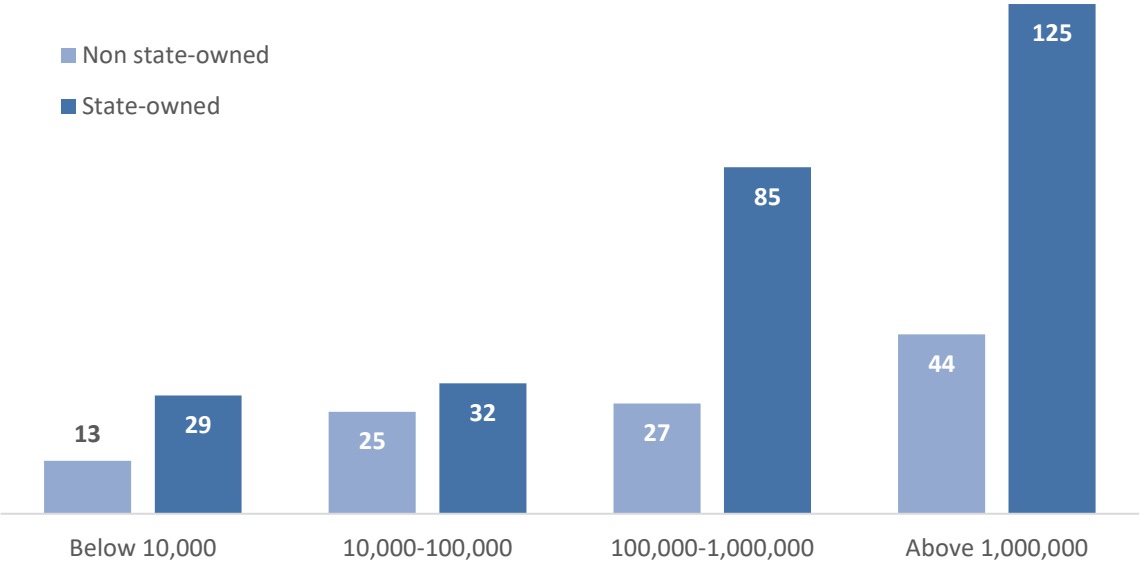


Figure 7: How much energy does your company annually consume in China? – by enterprise type (tce/year) (n=380)

National emissions trading system

Survey respondents were asked a number of questions regarding the national emissions trading system, including with regard to sectoral coverage, management of the market and price expectations.

Sectoral coverage

After electricity generation, the cement sector and the iron and steel sector stand out in terms of perceived carbon market readiness, with over a third of respondents expecting them to be ready to join the national carbon market by as early as 2023, and the average of responses being that those sectors will have joined by 2024. The other key emitting sectors are expected, on average, to join by 2025.

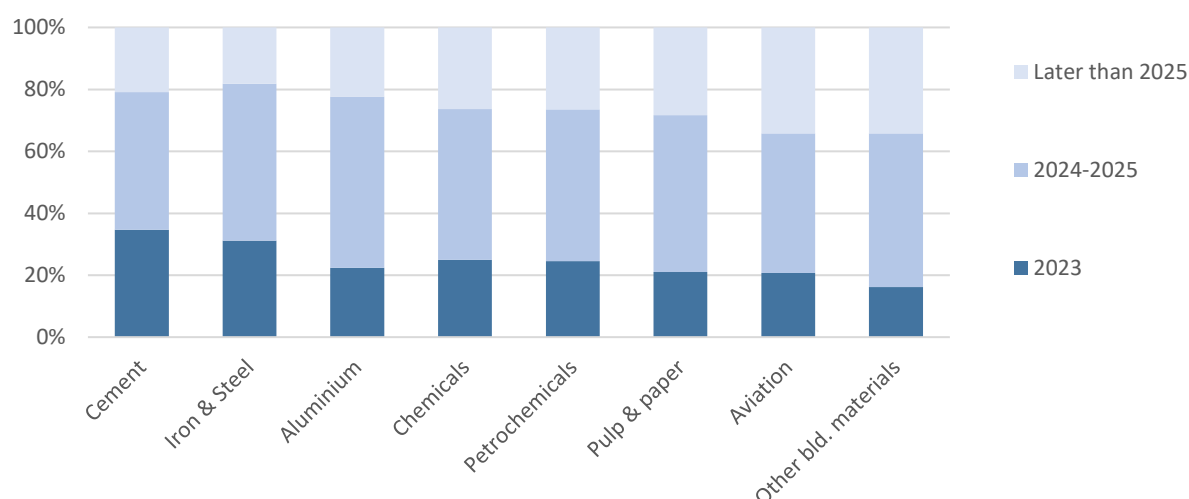


Figure 8: Which other sectors do you think will be ready to join the national system?
(n=392,385,371,368,367,356,342,371)

Allowance allocation

Benchmarking and historical (grandfathering) allocation are two common methodologies for free allowance allocation in an emissions trading system. Benchmarking calculates allowance allocation to installations or entities based on a benchmark value in one sector, which usually represents good performance in that sector and is determined based on reported GHG emissions data. Historical allocation calculates the allowance allocation in relation to an installation or entity's historical GHG emissions level in past years. Historical allocation may be unfair to companies which have already performed well in past years, and/or which are growing quickly. Benchmarking allocation tends to be fairer but is more complex to regulate and calculate.

Allocation for the first compliance period in the national carbon market for the power sector followed a benchmarking approach. In this year's survey, a clear majority of respondents from the building materials (inc. cement) and steel sectors identified benchmarking as the most appropriate methodology for allocating allowances. Two significant shifts have occurred in results for this year's survey compared to for 2021. First, a majority in the non-ferrous metals (inc. aluminium) sector now believe that historical intensity is a better allocation method, a reversal of last year's results. Second, respondents from the chemicals and petrochemical sectors are split fairly evenly on this question, whereas three quarters were in favour of benchmarking in last year's results. Consistent with previous results, very few industry representatives consider auctioning to be the best method of allocation at the current time.

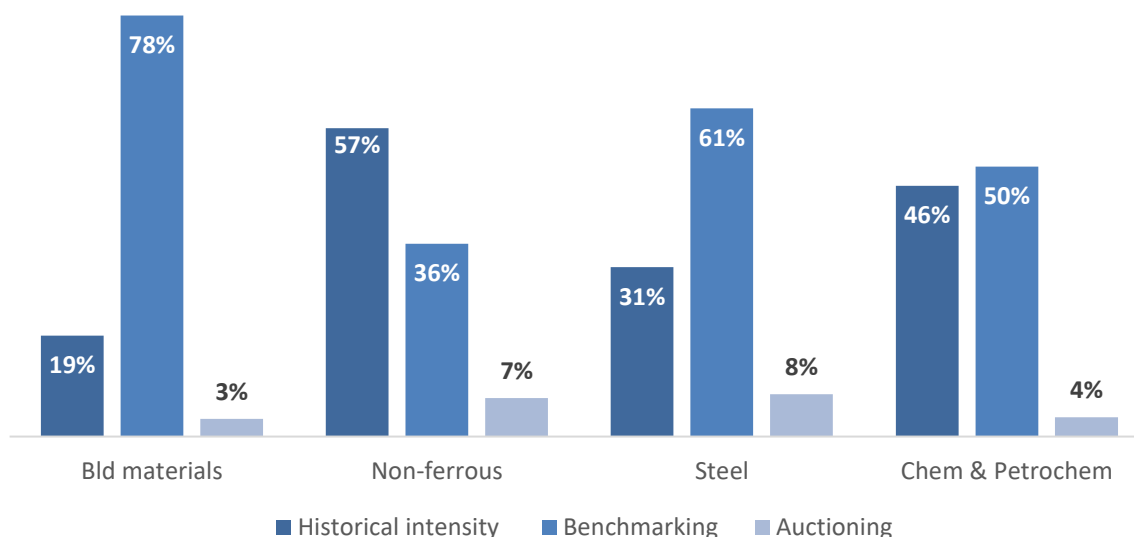


Figure 9: What do you think is the best method to allocate allowances? (n=91,14,51,28)

The allowance allocation plan for the power sector under than national carbon market, published in November 2020, defined separate benchmarks for coal power units with capacity of over 300 megawatts (MW), and for those 300MW and under. The survey asked power sector respondents whether the benchmarks set are adequate to encourage GHG emission reduction. Very few respondents suggested that the benchmarks were ‘too generous’. Respondents working for enterprises that have been covered by the regional systems are less likely to consider the benchmarks strict, compared to those that haven’t. Updated benchmarks for the second compliance cycle⁷ were announced on 31 October 2022, which is just after the survey was conducted, where smaller installations are proposed to face a stricter tightening than the large ones.

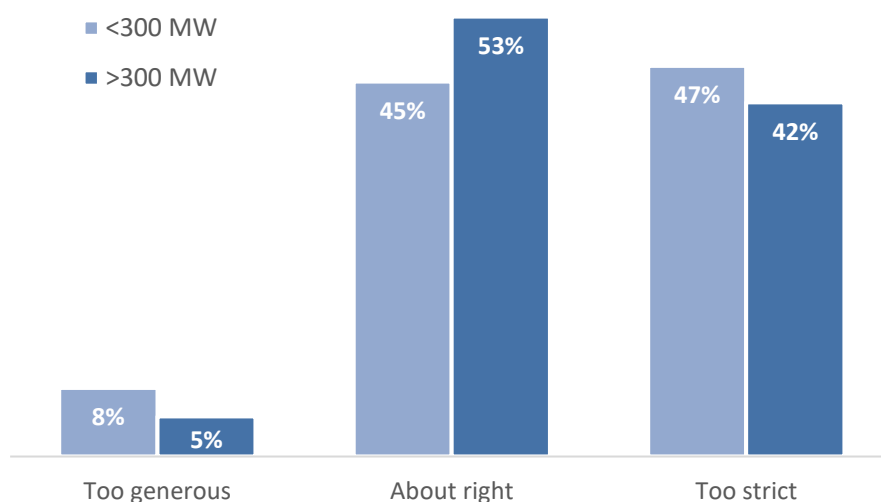


Figure 10: Are the benchmarks set for the national carbon market adequate to encourage GHG emission reduction? (n=127,119)

⁷ Implementation Plan for Allowance Cap Setting and Allocation for the National Carbon Trading Market in 2021 and 2022: <https://www.mee.gov.cn/xxgk2018/xxgk/xxgk06/202211/W020221103336161991455.pdf>

Selected quotes from power generators on the adequacy of allowance allocation benchmarks:

- As power market reform continues to deepen, thermal power plants will play more of a backup role and frequently participate in peak shaving for the power grid, resulting in a significant increase in the cost of coal plant operations. If the allowance allocation method is further tightened, the costs for enterprises will be further increased. – *Large Hubei power generator*
- The surplus of allowances for 300MW and below units is large, while many 600MW units have suffered losses, and the 1000MW units have a large allowance surplus. This seems unfair to 600MW units. – *Beijing headquartered large power generator*
- Judging from the implementation in the past two years, the benchmarks are basically appropriate. – *Large Henan power generator*
- At present, the 600 MW level units in service in China face the same benchmark as 1000 MW units. However, coal consumption varies greatly, energy-saving transformations have been carried out for many years, and the space for further upgrade is limited. – *Large Shanxi power generator*
- There is a large deficit in the allowances for 600MW units, and a large surplus for 300MW units. – *Medium-sized Sichuan power generator*
- The baseline for 600MW units is too stringent. – *Large Shandong power generator*

Power sector respondents were asked how frequently the benchmark should be updated. Over half prefer a frequency of every five years, while 38% believe that annual updates are appropriate. Eight of those who chose 'other' suggested intervals between one and five years (i.e. two or three years). Multiple respondents suggested that benchmarks should be adjusted for each compliance cycle, which currently cover the emissions for two years at a time.

Benchmarks need to be regularly updated

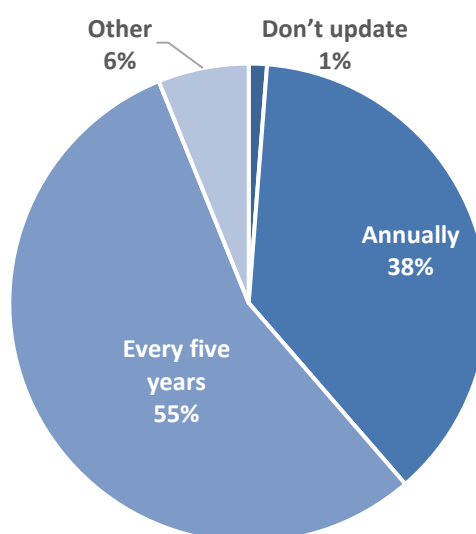


Figure 11: How frequently should the benchmark be updated? (n=163)

Selected quotes on the updating of benchmarks:

- The structure of the power generation industry is currently in a stage of rapid change, and it is suggested to adjust benchmarks each year to adjust to market demand. – *Large Hubei power generator*
- If the benchmark is updated too frequently, it will be hard for market players to accurately predict their demand and therefore be unwilling to trade. If the baseline is not updated, or updated infrequently, it may not be suitable for meeting government targets, as it must keep pace with market changes. Therefore, it is suggested to update every five years. – *Beijing headquartered large power generator*
- It would be more reasonable to adjust benchmarks in conjunction with the compliance cycle. – *Large Sichuan power generator*
- Setting baselines is time-consuming and labour-intensive, and the cost of verification and accounting is too high. – *Small Xinjiang power generator*
- Updating each year is not necessary because the iterative changes to technology are not so frequent. Updating every five years should be considered. – *Large Ningxia power generator*
- Reasonably adjust the baseline according to the economic situation in that year, to limit the pressure on thermal power generators. For example, due to the high coal price last year, as well as environmental protection controls, survival has become difficult, and the pressure from carbon compliance has increased sharply. – *Large Shanxi power generator*

Half of those with a view expect auctioning of allowances will be introduced to the national carbon market in the second half of this decade.

Auctioning of allowances expected to be introduced by 2030

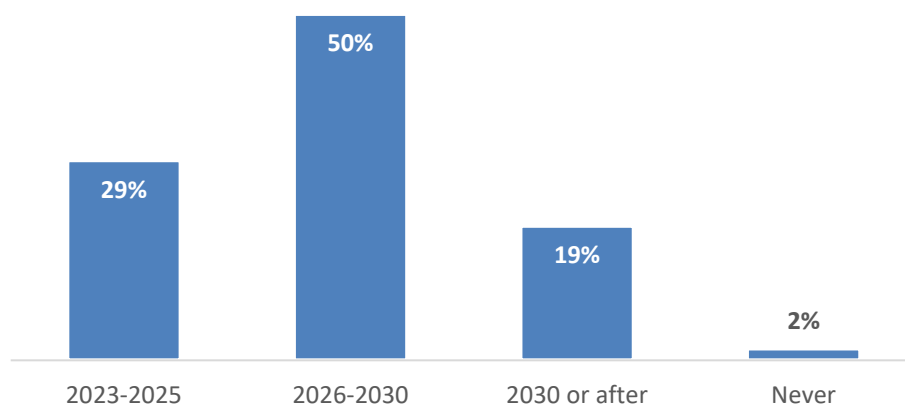


Figure 12: By when do you expect auctioning of emission allowances to be introduced into the national carbon market? (n=412)

Measuring emissions

The vast majority of power sector respondents prefer using actual values measured by the entity in acquiring key emission factors for calculating the total GHG emissions of installations.

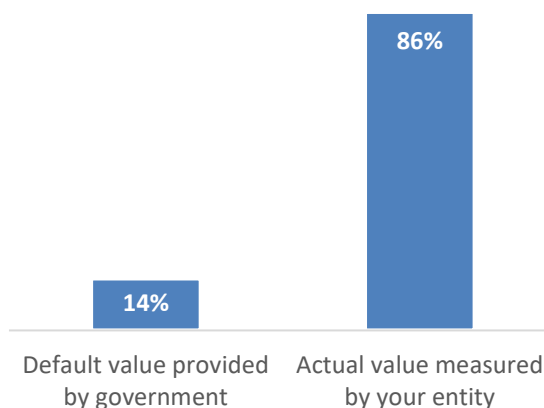


Figure 13: Which approach do you prefer in acquiring key emission factors when calculating the total GHG emissions of your installations? (n=122)

Selected quotes on acquiring emission factors:

- The actual practice of measurement is difficult. The technical requirements are high, and it is difficult to supervise. – *Large Beijing headquartered power generator*
- There are large differences in coal types between regions, and using measured values is more helpful for undertaking carbon measurement. This will increase the importance that enterprises attach to it, and encourage investment in testing equipment and training. – *Medium-sized Xinjiang power generator*
- For entities with low consumption of fossil fuels, the default value can be adopted. Actual measured values should be used for large fuel consumers. In fact, the default value is much larger than the actual measured value. – *Large Ningxia power generator*

38% of respondents believe that the installation of a constant emissions monitoring system (CEMS) is the most crucial measure to ensure the credibility of GHG emissions data of entities. A further quarter of respondents believe that clarification of the legal responsibilities of emitters and verifiers to be the most important measure.

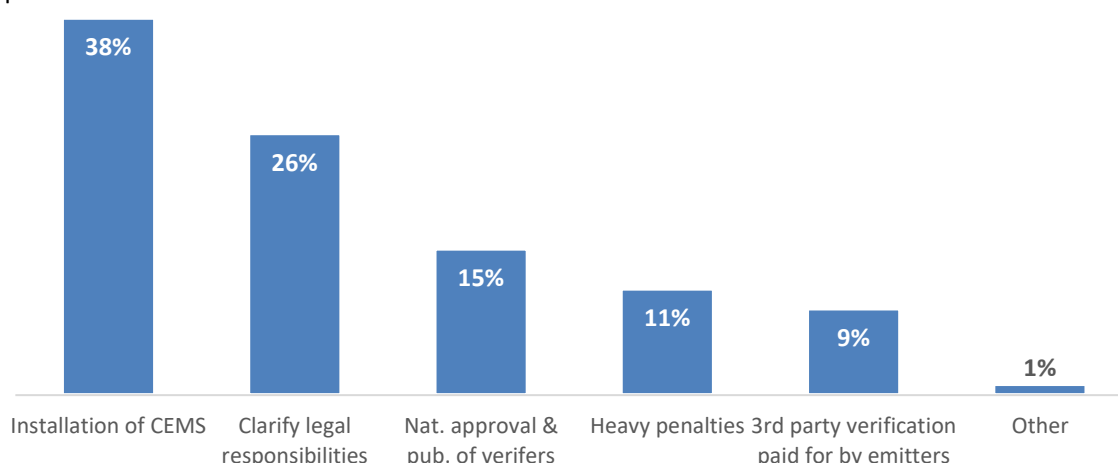


Figure 14: Which measure do you consider most crucial to ensure the credibility of GHG emissions data of entities? (n=446)

Management of the national carbon market

Respondents were asked about the level of penalty or incentive structure would be strong enough to ensure a high percentage of compliance. The most popular choice was a negative credit record for non-compliant companies, whereby companies' ability to secure finance from banks may be affected. This is consistent with previous results.

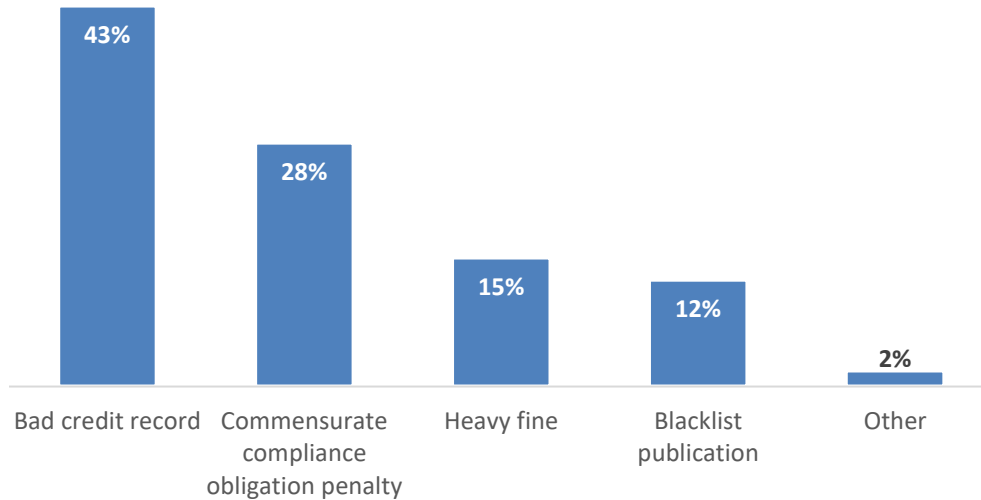


Figure 15: What level of penalty/incentive structure would be strong enough to ensure a high percentage of compliance? (n=435)

Respondents were asked what types of data should be made public, in order to support transparency of the market. Almost two thirds identified annual company-level emissions data as the main priority.

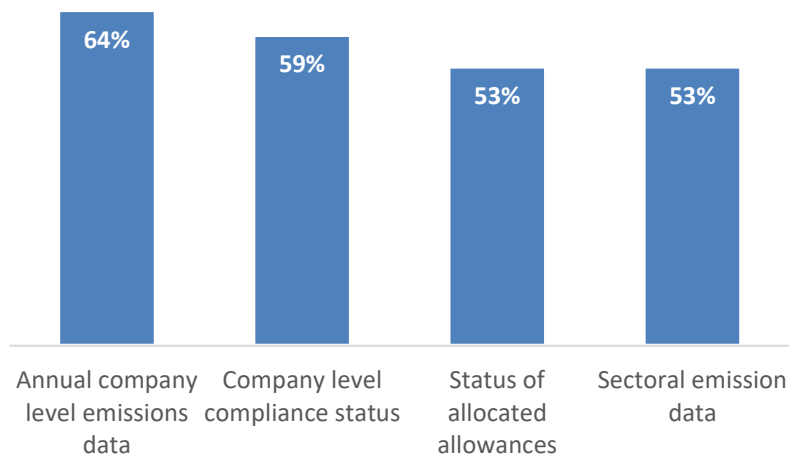


Figure 16: What data should be made public, to support transparency of the market? (n=450)

Half of respondents believe that non-covered entities (for example trading companies and institutional investors etc.) should be able to participate in the national carbon market by 2025.

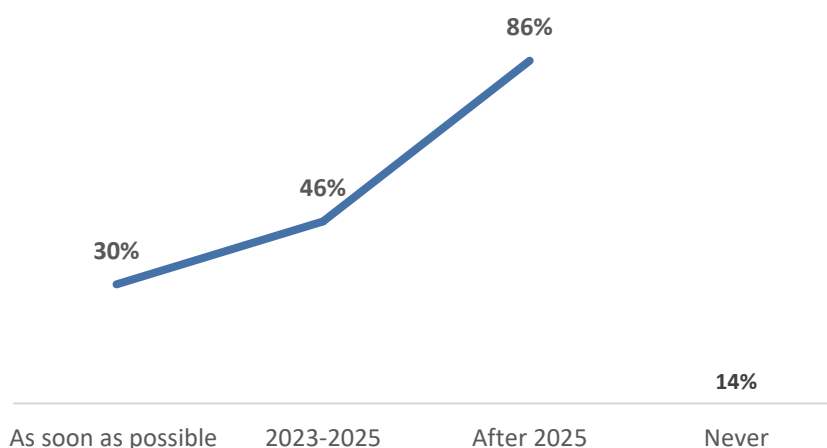


Figure 17: By when do you think that non-GHG emitting entities should be able to participate in the national carbon market? (n=412)

Selected quotes on the participation of non-emitting entities:

- Carbon emission allowances are attributable to industry, and non-emitting enterprises will participate with a financial motive, which can easily lead to higher carbon prices, disrupt the market, and increase the burden on enterprises. – *Guangxi steel producer*
- The early involvement of financial institutions will help the rapid development of the carbon market, while at the same time it can help to mature the role of the financial system in the carbon market as soon as possible. – *Anhui building materials company*

Respondents from organisations that are not emitting enterprises were asked to identify one type of carbon financial product that they consider most suitable for early introduction in the national carbon market. The most popular choice was ‘futures’.

Carbon futures are derivative financial contracts that obligate the parties to transact allowances at a predetermined future date and price. Here, the buyer must purchase, or the seller must sell the underlying allowances at the set price, regardless of the current market price at the expiration date. A repurchase agreement is the equivalent of a short-term, collateralised loan. An owner of allowances sells those allowances to a buyer for cash. As part of the deal, the seller agrees to buy back the securities at a later date. The price paid to repurchase the allowance is higher than the original selling price.

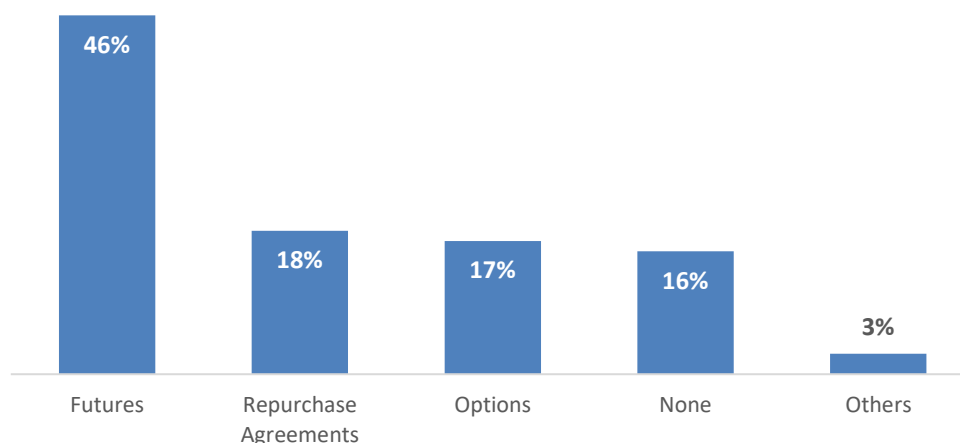


Figure 18: What types of carbon finance products are most suitable for early introduction in the national carbon market? (n=76)

According to **Administrative Rules for Carbon Emissions Trading (Trial)** issued by MEE in 2021, the transaction methods through the national trading system include agreement transfer, one-way bidding or other compliant methods. Agreement transfer refers to the transaction method in which the parties of the transaction reach an agreement and confirm the transaction, including listing agreement transactions and block agreement transactions. Of these, listing agreement transaction refers to a transaction method in which the transaction entity submits a selling or buying listing declaration through the trading system, and the intended transferee or transferor negotiates the listed declaration and confirms the transaction. Block agreement transaction refers to a transaction method in which both parties already have initial agreement to make a deal but have to inquire about the price and confirm the transaction through the trading system. The transaction volume of a single block transaction should be over 100,000 tonnes.

Just over half of the respondents with a view think that block agreement trading does not reflect the real price of carbon (the marginal abatement cost).

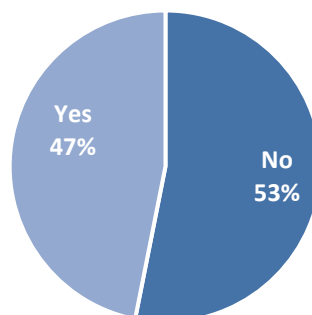


Figure 19: Do you think that block agreement trading reflects the real carbon price/marginal abatement cost? (n=352)

Enterprises covered by the national carbon market were asked about their experience to-date during the first and second compliance cycles. The results suggest that as of November 2022, there remains a substantial gap regarding the in-company capacity of many covered enterprises.

Companies require further capacity building

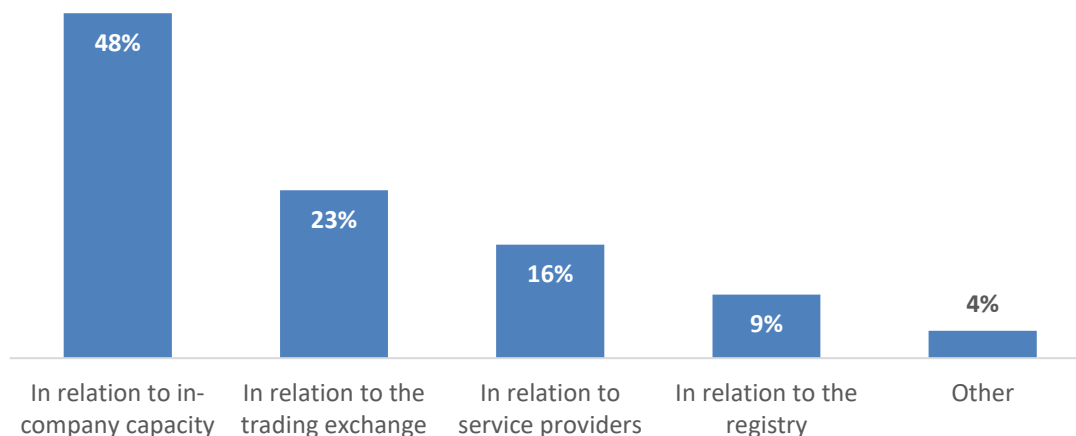


Figure 20: To-date, have you faced any difficulties during the compliance cycle? (n=158)

Selected quotes on difficulties faced during the compliance cycle:

- Low quality of personnel, frequent staff turnover. – *Inner Mongolia power generator*
- Government has organised enterprise emissions accounting clearly, but there is still a lack of capacity with regard to trading. Enterprise leaders pay a basic level of attention to the issue, but implementation is difficult for staff in practice. Internal management of the group is conducted by a dedicated institution, while specific enterprises have little autonomy in trading. – *Xinjiang power generator*

Survey respondents were asked whether they expect that China will specify an absolute emissions target by certain dates. This step has been discussed for some time amongst the expert community and policymakers and would have implications for the design of the national carbon market. Only 37% of respondents said that they expect an absolute target by 2030 (down from 48% last year), while almost half expect this to occur post-2030.

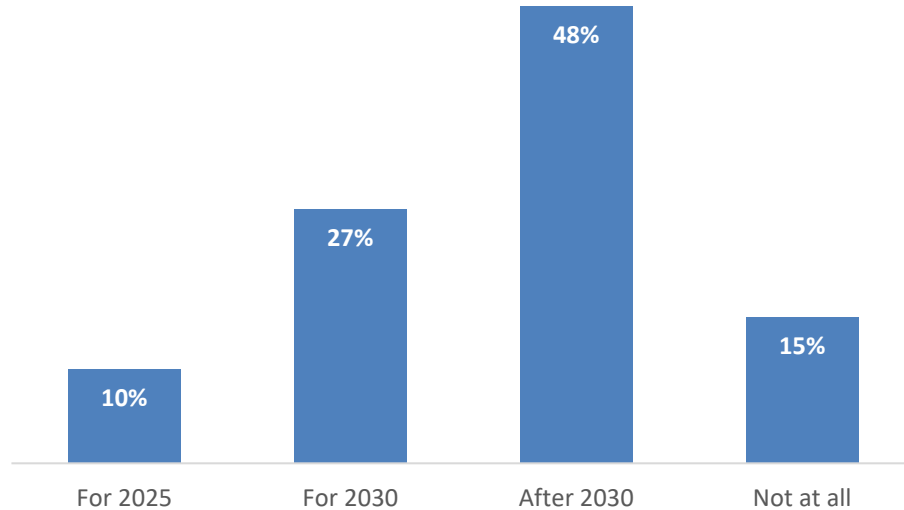


Figure 21: Do you expect that China will specify an absolute emissions target for: (n=423)

Carbon price expectations

The China Carbon Pricing Survey has been tracking expectations and views on real market developments in the regional emissions trading systems from the pilot phase through several compliance cycles to their current status as mature carbon markets.

Respondents based in pilot regions were asked about their expectations for prices in the regional markets, both for the highest and lowest prices in the regions, providing a range of expected prices for the years ahead. For context, prices in the regional systems ranged from CNY 31/t in Chongqing to CNY 104/t in Beijing around the time of the survey. The full spread of regional prices is outlined in Figure 1 on page 3.

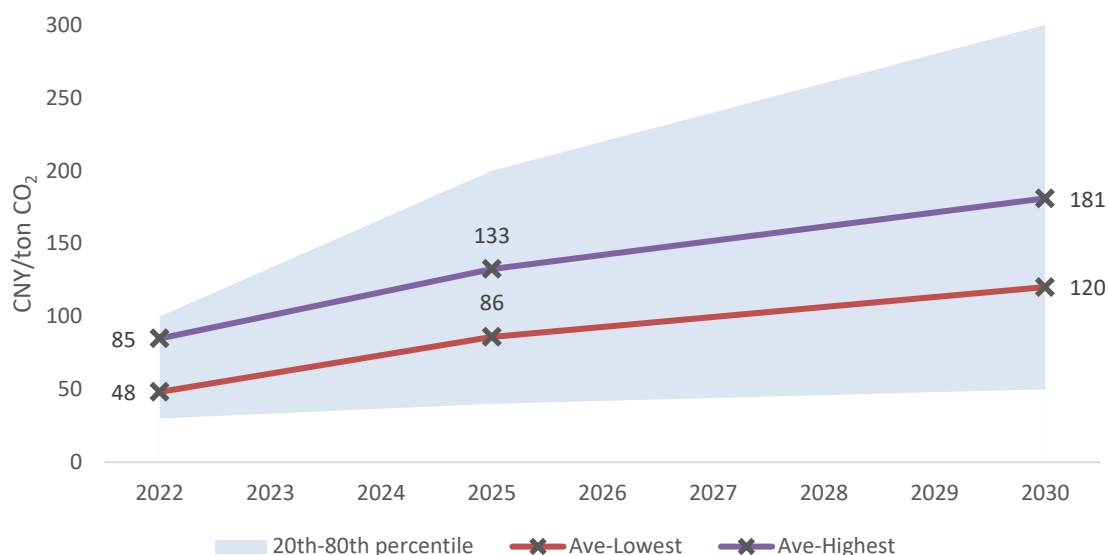


Figure 22: What do you expect the highest and lowest prices in the pilot regions to be in the coming years? (n=161,159,160)

Selected quotes on prices in the regional systems in the coming years:

- The current national allocation policy will tighten further, and the price of allowances is expected to rise to an extent before CCERs are fully opened to the market. However, with the further deepening of new energy development and liberalization of the CCER policy, the carbon price will fall to a certain extent, but the overall price will basically stay within a certain range. – *Hubei power generator*
- The price will gradually align with the international carbon price. – *Hubei academic*
- At present, the economy-wide marginal abatement cost in China is about 7 US dollars. For the carbon market to function effectively, the carbon price should be greater than or equal to \$7 per ton. Moving towards the goal of carbon peaking in 2030 and carbon neutrality in 2060, the full-scale carbon emission reduction costs of the Chinese economy will also increase, so there is still room for carbon prices to rise. During the 14th Five-Year Plan period, the carbon price in China's carbon market may be around US\$8 to US\$10 per ton. During the 15th Five-Year Plan period, the carbon price may rise further to US\$15 per ton. – *Hubei academic*

Almost 40% of respondents who expressed a view, said that the price in the national carbon market at the time of the survey were similar to what they had expected. There is a slight divergence in views between covered industry and other respondents, however – a larger share of covered entities says prices are higher than they expected.

Covered entities more likely to think that the price is higher than expected

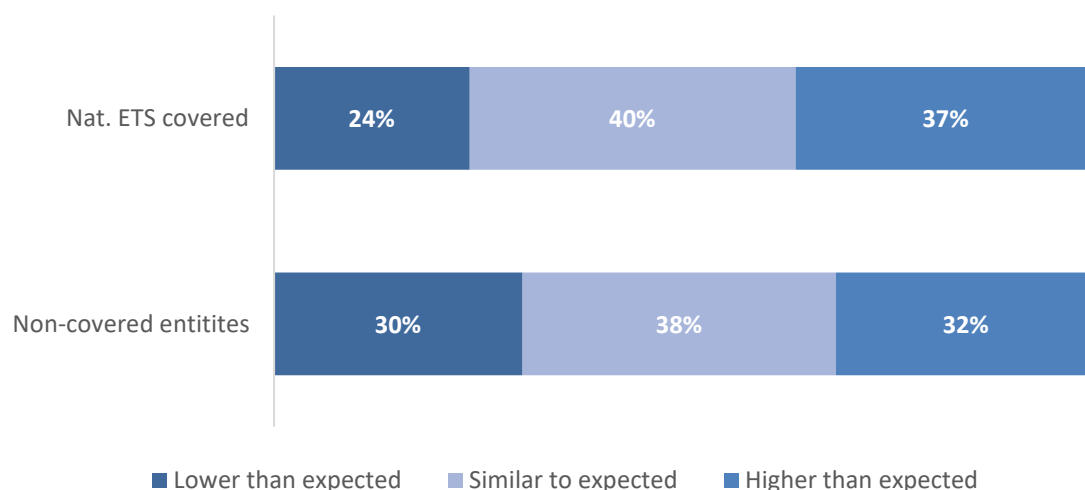


Figure 23: How do the current prices in the national carbon market compare with your expectations? (n=366)

Since 2013, this survey has been testing stakeholders' expectations of prices at the national level, allowing previous expectations to be compared with a real national price on carbon. The 2021 survey saw an average expectation of CNY 49/tonne CO₂ in that year, having been conducted just after the launch of trading in July.

This year, respondents were again asked what they expect the average carbon price to be at different points in time in the national carbon market 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 market is expected to be CNY 59/t in 2022, rising to CNY 87/t in 2025, CNY 130/t in 2030, and CNY 239/t by mid-century (Figure 34). While the actual price levels remain highly uncertain, the range of expectations has narrowed somewhat since last year's survey. The 20th-80th percentile range grows from CNY 49/t to CNY 60/t in 2022 to CNY 58/t to CNY 180/t in 2030.

The authors removed several extreme responses.⁸ The chart below indicates both the average (mean) of expectations, as well as the median. 34% of respondents provided no price estimates.

⁸ The authors removed outlying responses from 3 respondents, defined as 1,000 CNY/tonne or above up to 2030 and over 2,000 CNY/tonne for 2050. These were considered to be extreme and therefore not included in the analysis.

China's carbon price is expected to steadily rise

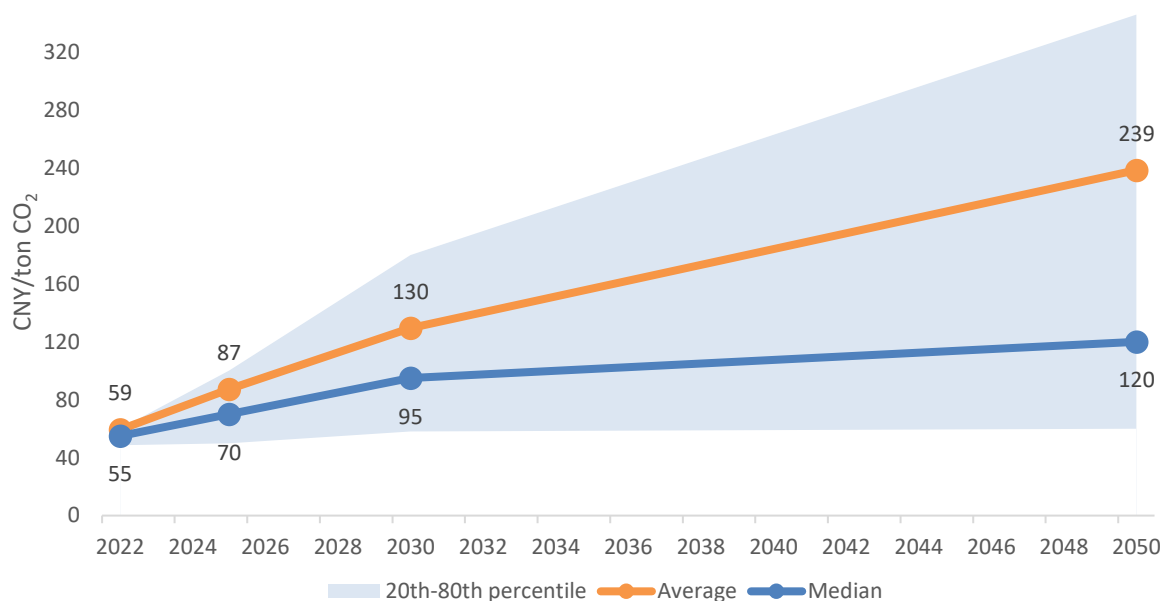


Figure 24: What do you expect the price in the national carbon market to be in the coming years?
(n=297,299,289,289)

Long-term price expectations vary between industry and non-industry respondents, with industry consistently expecting lower prices.

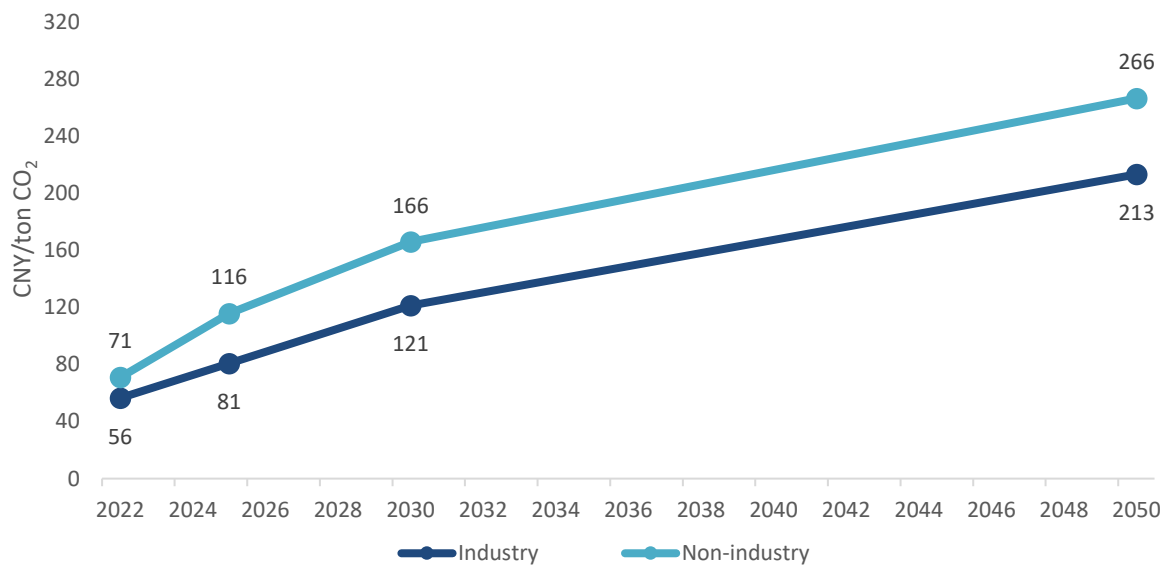


Figure 25: What do you expect the price in the national carbon market to be in the coming years?
Industry vs Non-industry

The future price expectations to the end of this decade are slightly lower than in last year's survey, however they remain substantially higher than previous surveys up to 2020 (Figure 26). Expectations for future prices generally appear to be influenced by the current actual price levels.

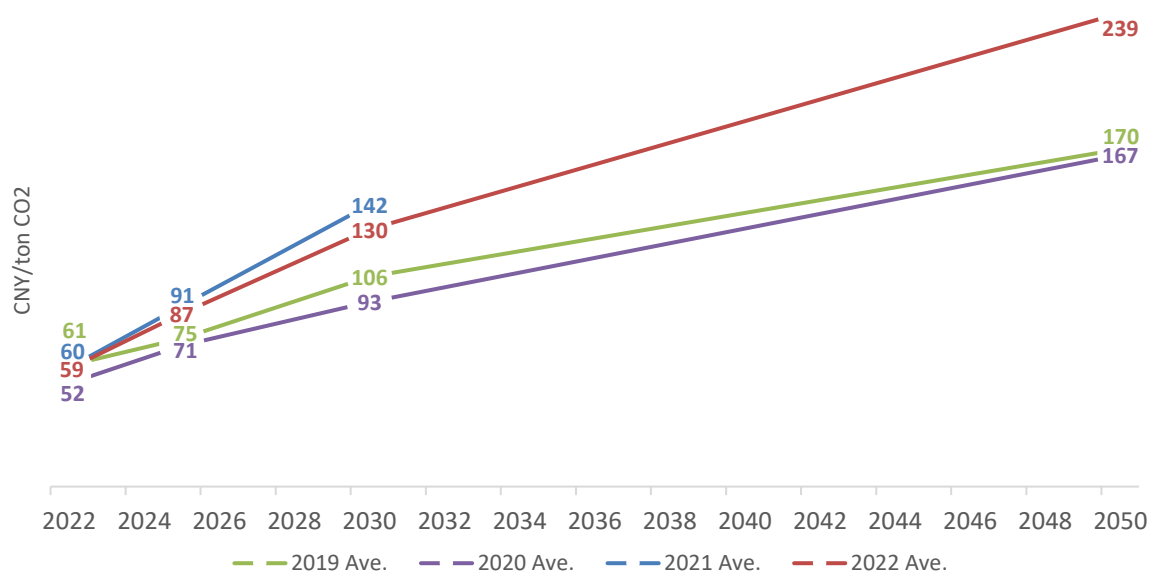


Figure 26: Expectations of the national carbon market price, 2019-2022 China Carbon Pricing Surveys.

It is worth noting that the expected carbon price is only a partial indicator of the overall effort to reduce carbon emissions, because the carbon market is complemented by non-pricing policies such as mandatory closure of inefficient facilities, incentives for energy saving, support for renewable energy, etc.

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

- If the benchmark is reduced annually, the price will increase. – *Shandong power generator*
- With the stringent implementation of the dual 30/60 goals, the energy-saving and emission-reduction work of enterprises is also accelerating. As the baseline is gradually tightened, the amount of tradable allowances will gradually decrease! – *Jilin power generator*
- As the government increasingly emphasises development of the carbon market, the carbon price will increase. – *Xinjiang chemicals company*
- As the peaking/neutrality goals approach, pressure to reduce carbon emissions will be enormous, and the carbon allowance deficit for companies will increase, leading to higher prices. – *Hubei academic*
- With reference to foreign carbon market prices, and the government's approaching 2060 carbon neutrality target, the carbon price should be high. Before 2025, there will be a single compliance unit, and the carbon price will see a steady upward trend. After 2030, with the addition of non-emitting entities, market activity will increase and the carbon price will rise sharply, which is conducive to enterprises increasing carbon reduction efforts. – *Jiangsu steel producer*
- Before the carbon peak, it may be a wait-and-see period, and there will be a steady decline. Once national policies are further developed, the price of carbon will be pushed up and allowances will be in short supply. After the peak, the national goal will shift to carbon neutrality, the supply of green carbon will gradually exceed demand, and the price of carbon will fall. – *Yunnan building materials company*
- 2030 will be an important turning point. The growth rate will moderate, carbon will peak somewhat higher than the current level, and the economic foundations will be built. After 2030, there will be a process towards carbon neutrality in 2060. At this stage, carbon emissions will basically be controlled. At the same time, government policy will lead to a certain amount of domestic population growth, and the employment demand generated is a problem that must be solved. At this time, the carbon price should return to a more reasonable range, so as to balance the relationship between economic development, people's livelihoods and sustainable development. – *Xinjiang chemicals producer*
- The price of carbon trading is too low and enterprises are not motivated. – *Xinjiang petrochem company*

Voluntary carbon market/offsets

The demand for offset credits from Chinese companies has been accelerating quickly since the announcement of China's national 2060 carbon neutrality goal. On the one hand, enterprises covered by emissions trading systems (compliance markets), are able to meet a small share of their compliance obligation with China Certified Emission Reduction (CCER) credits. On the other hand, many large enterprises not currently covered by compliance markets are making voluntary commitments to become carbon neutral including through the use of offset credits that may be validated by a wide range of accreditation systems.

In this year's survey, respondents from emitting enterprises were asked whether their companies currently purchase offset credits. Only 16% who were sufficiently informed to answer said that their company was a purchaser of offsets.

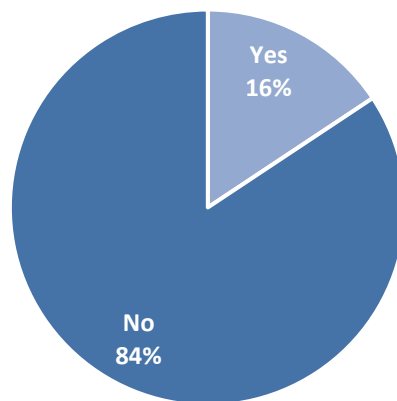


Figure 27: Does your company purchase offset credits? (n=287)

Of those companies that do currently purchase offset credits, CCERs are by far the most popular type of offset purchases.

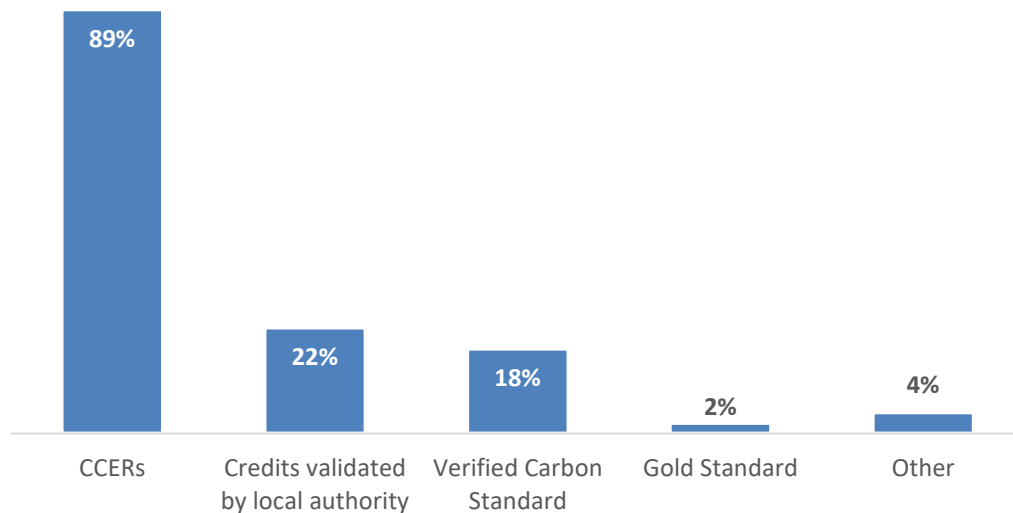


Figure 28: If yes, what type? (select one or more) (n=45)

Emitting enterprises were asked whether they prefer certain types of offset credits. Only 14% said that they had a preference, and of those the most common preference was for projects involving well-established technologies like solar and wind power generation.

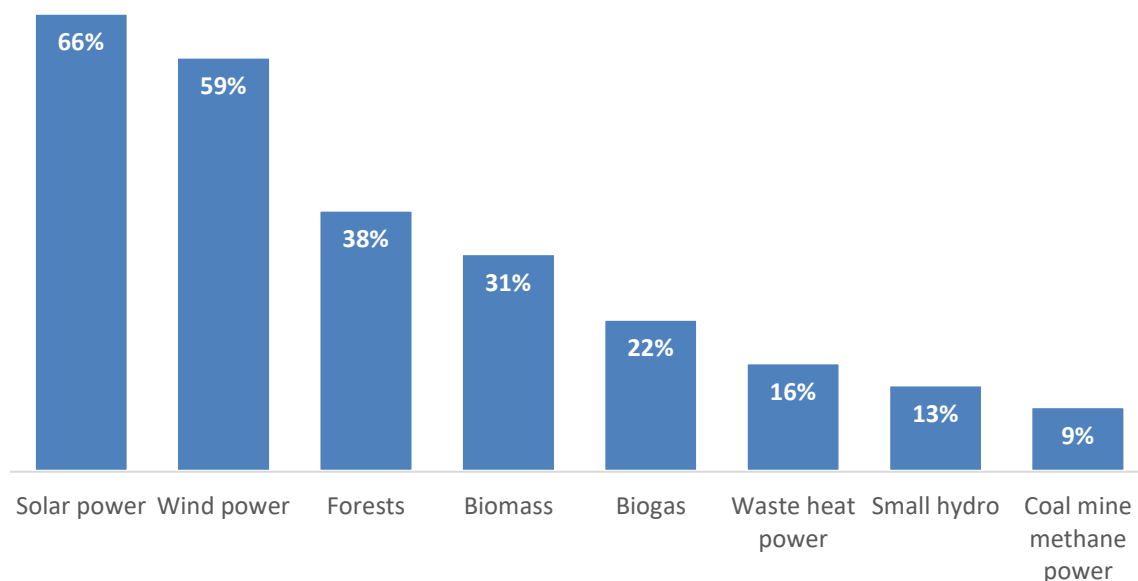


Figure 29: Does your company prefer certain types of offset credits? If yes, what type? (select one or more) (n=32)

Apart from CCERs, at least half of respondents expect that credits validated by local authorities will also be eligible for providing offset credits in the national carbon market. Credits via Verra's Verified Carbon Standard (VCS) also have significant support, though lower than in last year's survey (56%).

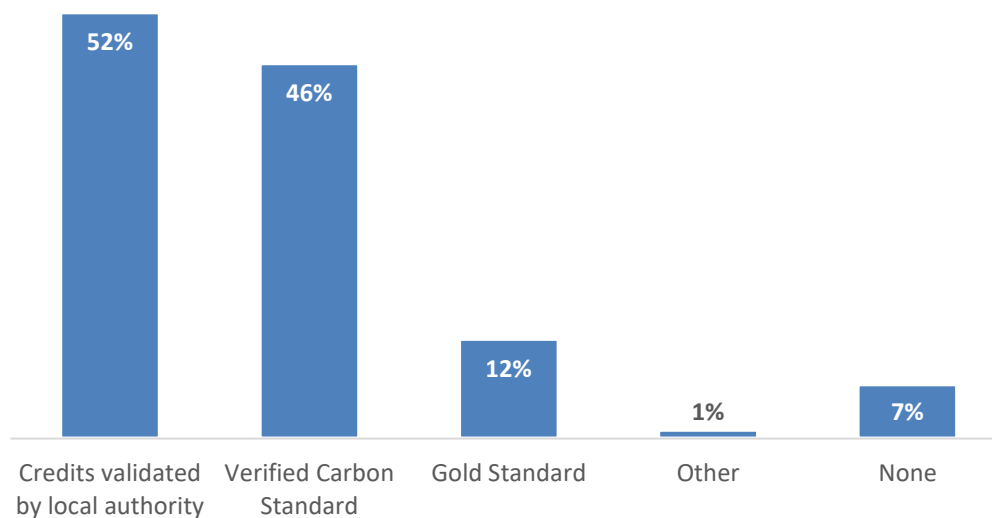


Figure 30: Apart from CCERs, what products do you expect to be eligible for national carbon market as offset credits? (select one or more) - % of total respondents (n=364)

The national *Administration Measures* specified that a maximum of 5% of a company’s compliance obligation can be met by CCERs, and that they cannot be generated from emission reduction projects that result from actions taken by covered entities as a result of the national carbon market. Respondents were asked whether they expect any other restrictions to be applied to the offset credits utilised within the national carbon market. The most commonly expected restriction relates to the vintage year of credits.

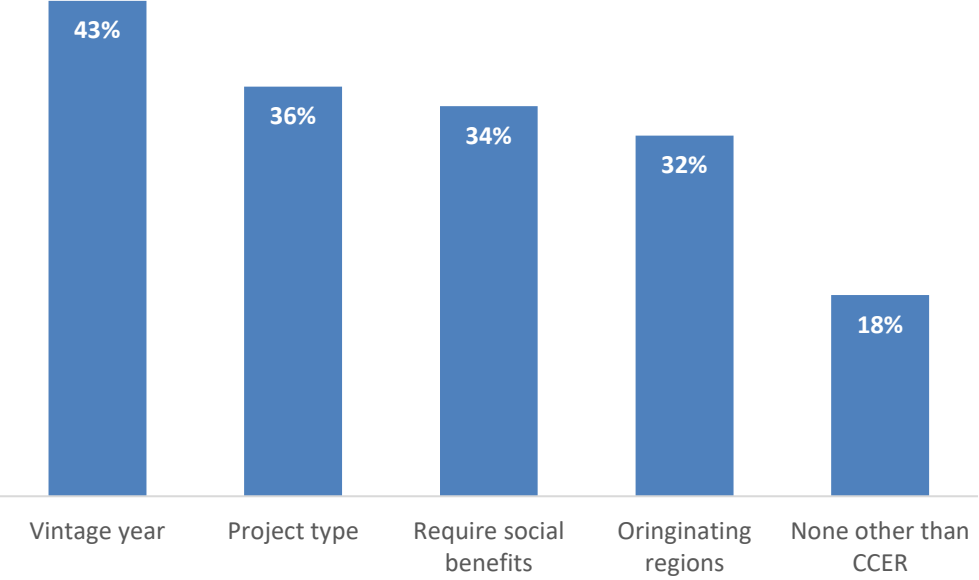


Figure 31: Do you expect any restrictions in the use of offset credits? (n=357)

Readiness for emissions trading

Respondents were asked whether they required further training to perform/administer tasks under the national carbon market, and 89% responded that this was indeed the case, including the same proportion for power sector respondents who are already covered by the national market.

Among the 367 responses from emitting enterprises, the highest demand for capacity building relates to basic understanding of the framework of an emissions trading system, however there are needs across a wide range of areas.

Capacity building is needed in many respects

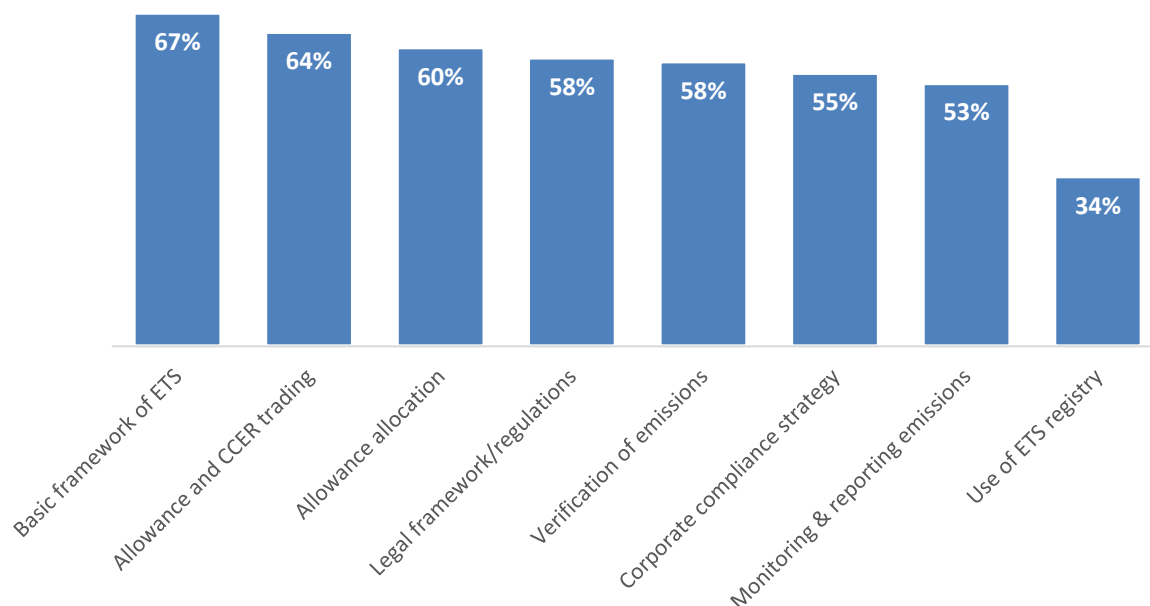


Figure 32: Do you need further training in order to perform/administer tasks under the national carbon market? (% of total emitters, not just those that require training) (n=367)

Comparing the responses of companies which have participated in regional pilot carbon markets, versus those who didn't, the survey shows a slightly lower demand for further training on average (80%).

The emitting enterprises were asked whether they had formulated a dedicated team to handle carbon trading obligations. 63% of respondents had dedicated either an individual or a team (similar to last year).

Over half of companies have formed a team to handle carbon trading obligations

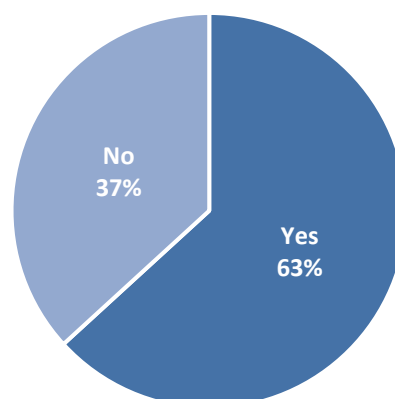


Figure 33: Has your company assigned a dedicated person (internal or external) or formed a dedicated team to handle your carbon trading obligations? (n=337)

For the industry respondents who have a team dedicated to handling carbon trading obligations, the vast majority have teams of less than 10 people, with the average team consisting of 7.7 people, up from 4.4 in last year's survey. The numbers vary significantly between industries, which is understandable given the different company sizes, and the fact that the power sector has developed more experience with carbon markets, including the previous Clean Development Mechanism (CDM). The results do not suggest that companies with small teams are understaffed. Even large compliance firms can manage with teams of five or less dedicated professional staff for MRV and allocation purposes.

Most companies have small teams to deal with carbon trading obligations

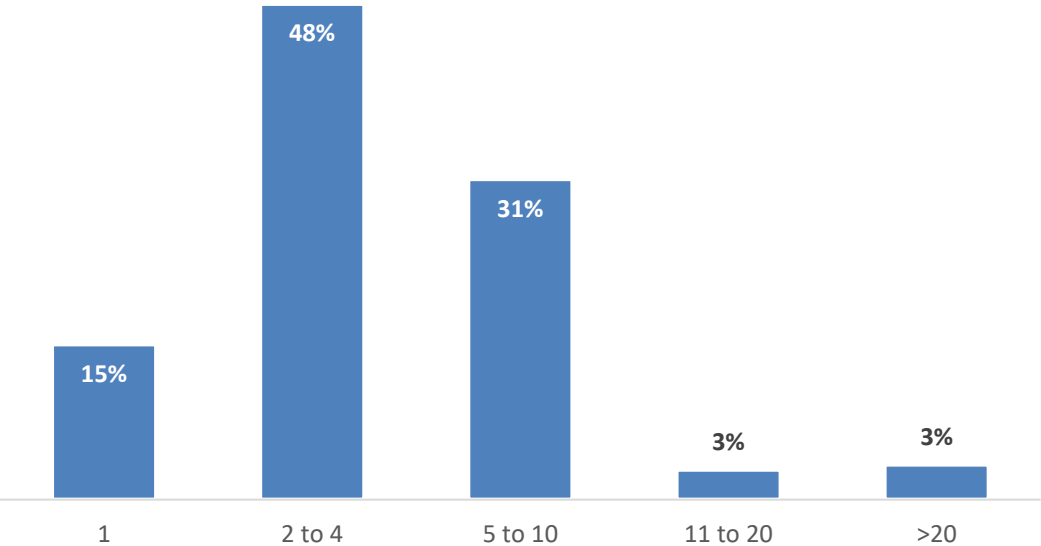


Figure 34: How many people are in the team? – Industry respondents (n=213)

In terms of the make-up of companies' carbon trading compliance teams, respondents for the first time identified 'management' as the most represented group involved. Other expertise best represented relates to 'safety and environment' and 'energy saving'. Financial experts and engineers are relatively under-represented.

Management is increasingly involved in carbon trading compliance responsibilities

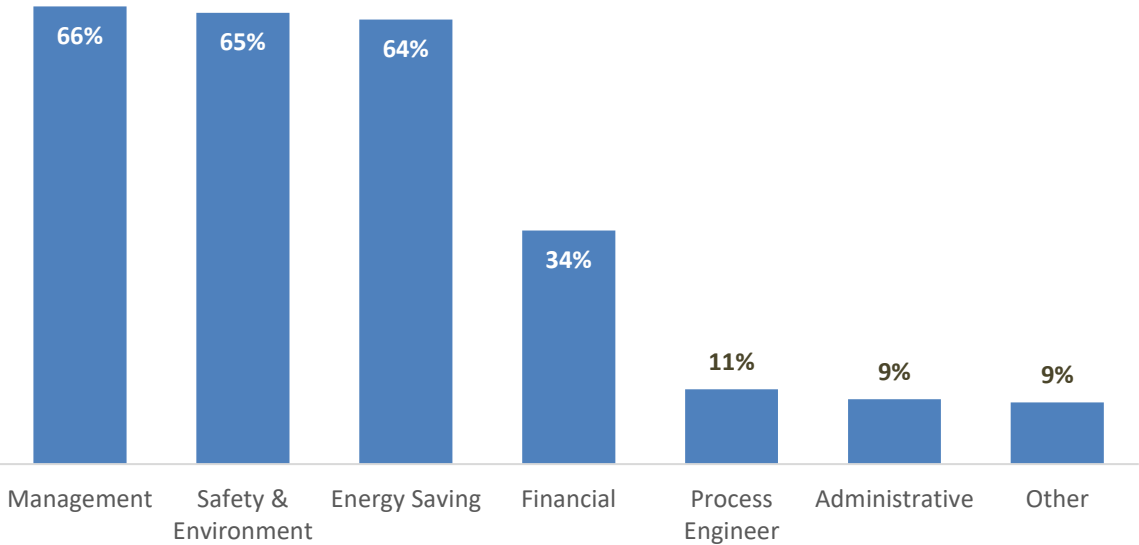


Figure 35: What are the competencies of the person(s) you have assigned to handle carbon trading obligations? (n=213)

‘Emission reduction measures’ was again the most frequently selected approach for emitters to meet their compliance obligations, however by a larger majority than in the past. In last year’s survey half intended to pursue emission reductions, while at least 40% intended to purchase allowances or CCERs to meet their requirements. This year, two thirds now plan to reduce emissions firstly.

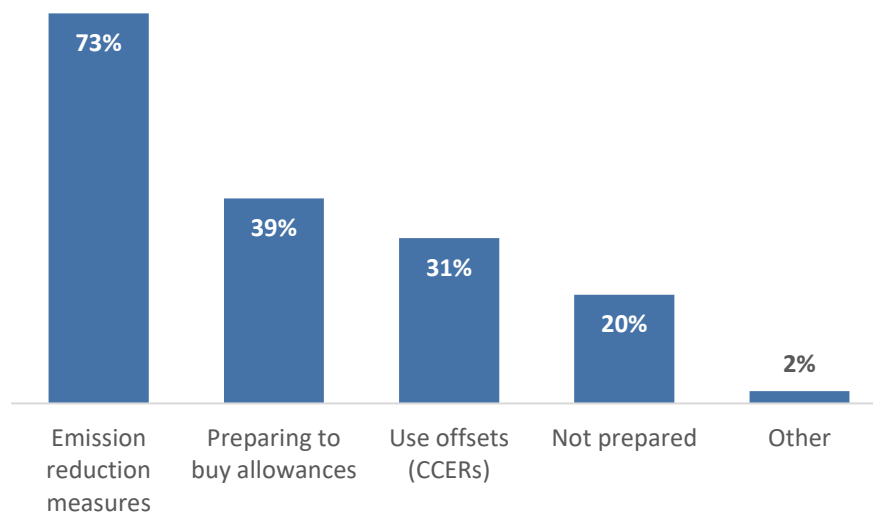


Figure 36: How does your company plan to meet its compliance obligation? (n=361)

Of the emitting enterprises, 68% state that their company has set an internal emission reduction target, significantly up from 43% last year. However, fewer power generation companies have set long-term targets than those in other sectors, despite their participation in the national carbon market.

More and more companies have set internal emission reduction targets

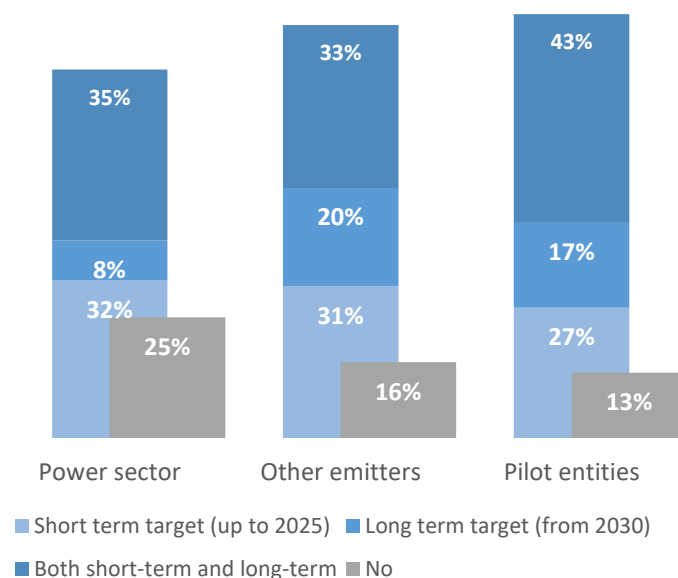


Figure 37: Does your company have an emissions reduction target? (n=278)

15% of emitting enterprise respondents who were aware of their company’s approach indicated that they had implemented an internal carbon price, a slight increase from last year. For companies covered by regional pilots, the share with an internal carbon price is 20%. As much as 38% of industry respondents were unsure if their companies had implemented such a measure, similar to previous surveys. Internal

prices averaged CNY 72/tonne, up from CNY 61/tonne in last year's survey.⁹ While there were limited positive responses to this question (only 35), it suggests that some companies are setting internal carbon prices above the current spot prices in China's national carbon market and most of the regional carbon markets.

Respondents at Group level of major companies were asked whether their company had undertaken internal distribution of allowances between subsidiary companies. A minority of these companies had undertaken such re-allocation measures, however this has increased since last year's survey (54% vs. 38%).

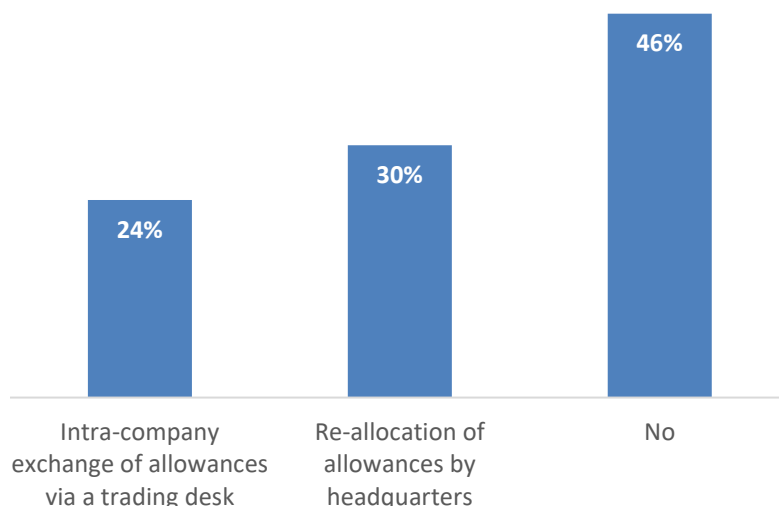


Figure 38: Has your company undertaken internal distribution of allowances between subsidiary companies? (for Group-level respondents) (n=68)

Power sector respondents were asked about their company's situation during the second compliance phase of the national carbon market regarding allowance allocation. A far higher proportion of respondents now expect that their company will need to buy allowances in the market in order to meet their compliance needs for the second period compared to last year's results for the first period (41% vs. 26%). Consequently, less respondents now expect to have a surplus (27% vs. 48%).

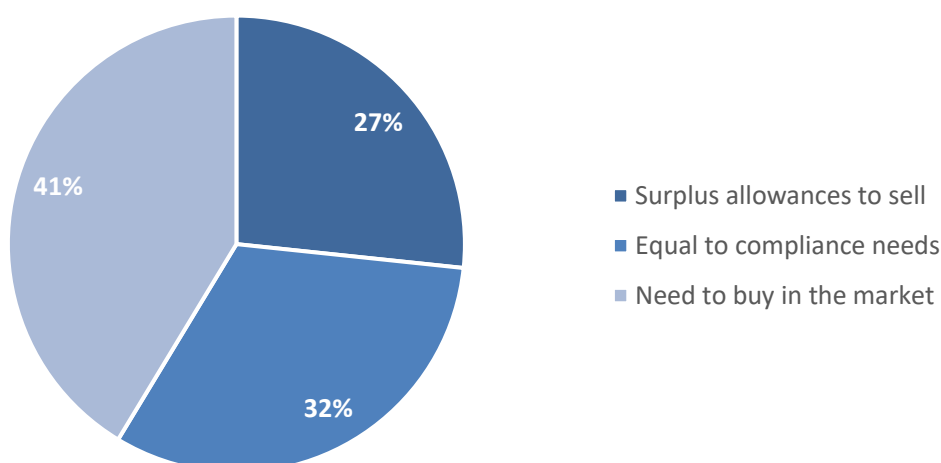


Figure 39: What do you expect your company's situation to be in the second compliance phase of the national carbon market regarding allowance allocation? (n=150)

⁹ The results for this question excluded one response from a chemical sector respondent who reported an internal carbon price of CNY 700/tonne. Authors excluded this response as an extreme outlier.

The same subset of respondents was asked which period they intend to trade their allowances. Contrary to conventional wisdom, very few respondents suggested that they would be trading very close to the compliance deadline. A larger share of respondents from entities that participate in the regional markets are prepared for trading across the whole compliance cycle.

Don't wait until the last minute to trade

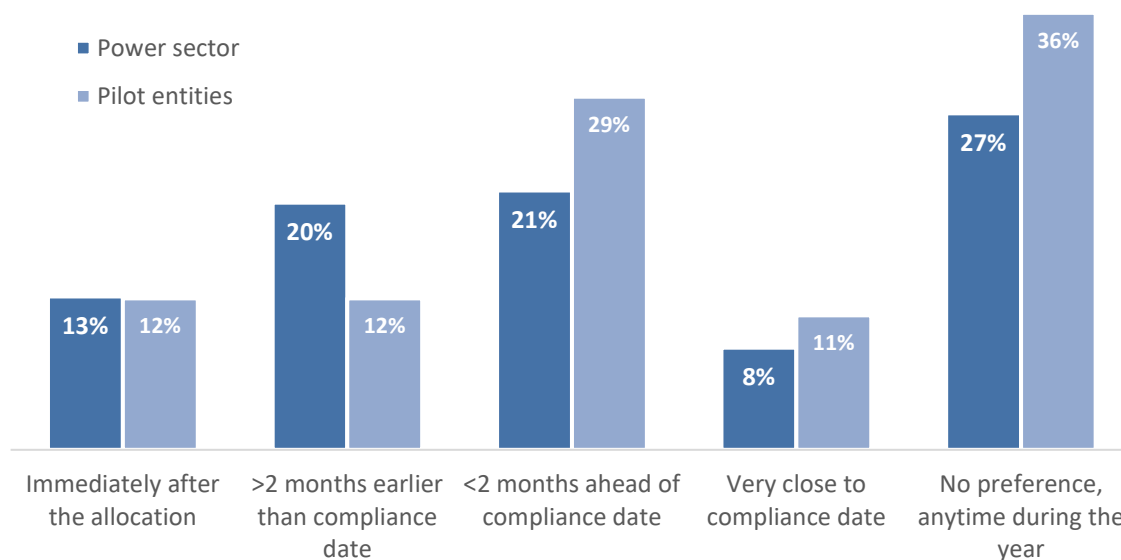


Figure 40: Which period do you intend to trade (sell or buy) your allowances? (n=144)

The power sector was also asked whether their company will primarily conduct block trading or regular spot trading. The majority that had a view said that block trading would be their company's main form of carbon trading. However a large proportion of power sector respondents (37%) were unaware of how to answer this question.

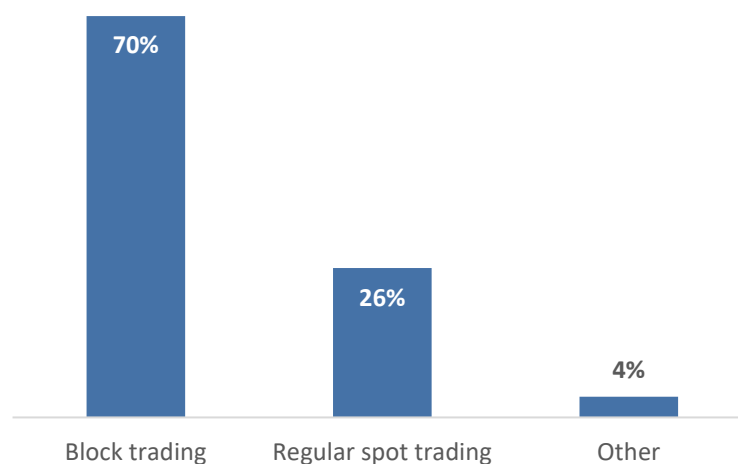


Figure 41: Will your company primarily conduct block trading or regular spot trading? (n=111)

Impacts of carbon pricing on investment

Respondents were asked if they expected the price of carbon to affect investment decisions in 2023, 2025, 2030 and 2050. Respondents expect the effect of carbon pricing on investment decisions to increase between the time of the survey and the end of this decade, though slightly lower impacts than in last year's survey. By 2025, about 3 out of every 4 respondents who expressed a view expect investment decisions to be at least moderately affected. Only 6% of respondents who answered this question expect investment decisions to be unaffected by 2025.

There is confidence that the carbon market will affect investment decisions by 2025

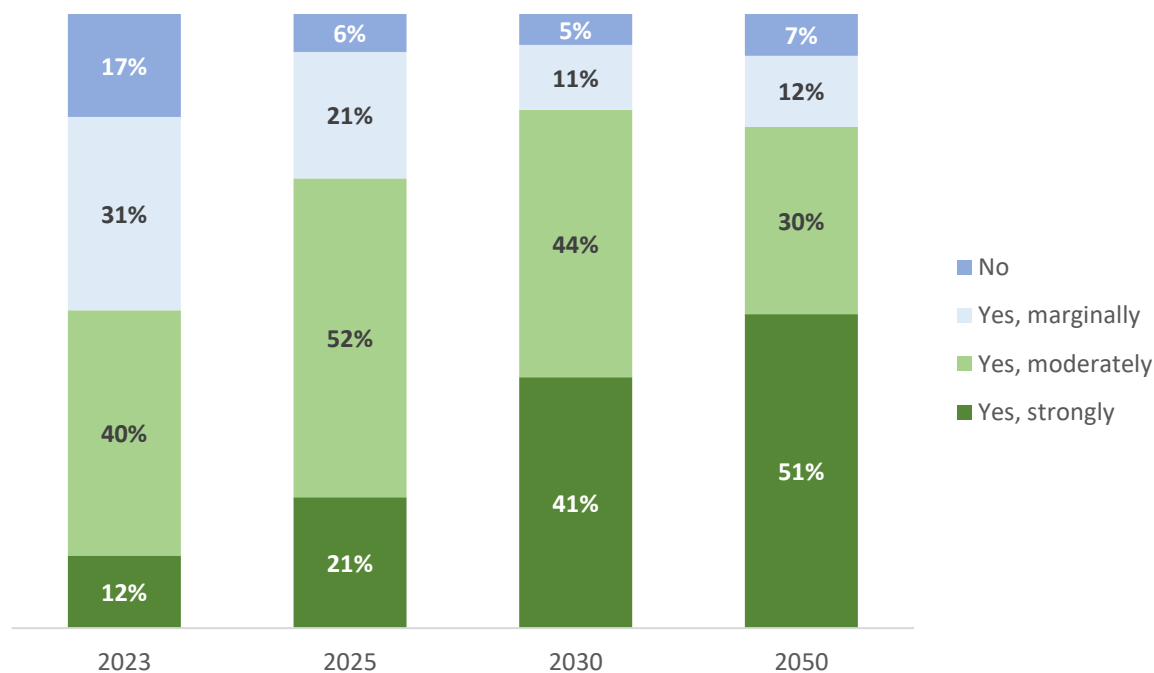


Figure 42: Do you expect the carbon market in China to affect investment decisions in 2023, 2025, 2030, 2050? (n=423,422,416,397)

Selected quotes on how the carbon market is expected to affect investment decisions:

- If the benchmark value is tightened, the company's allowances will not be enough to fulfil compliance obligations, carbon will become one of the company's major costs, and it will play an important part in the power trading decision-making. – *Zhejiang power generator*
- At present, allowance allocation for the iron and steel industry has not been initiated, and the industry has not been included in carbon market trading. – *Guangxi steel producer*
- The calcium carbide, power plant, cement, and coal chemical businesses in my company are all high-energy-consuming enterprises, and it is becoming more and more difficult to make decisions about their future investment. – *Xinjiang chemicals producer*
- At this stage policy goals are ambitious, while guidance on actual implementation is not equally strong, and actions have had little effect. I believe that the dual-carbon goals will have more influence on enterprises in the future, and the effect will become clearer. – *Sichuan food and beverage producer*
- After the implementation of carbon trading, enterprises with carbon intensive production facilities will be faced with halting and transforming their operations. It will be considered very carefully when conducting a new round of investment projects. – *Beijing headquartered petrochemicals company*

Power sector respondents were asked how the carbon market has affected their company financially. More say that the carbon market has so far had a positive rather than negative impact (49% vs. 34%).

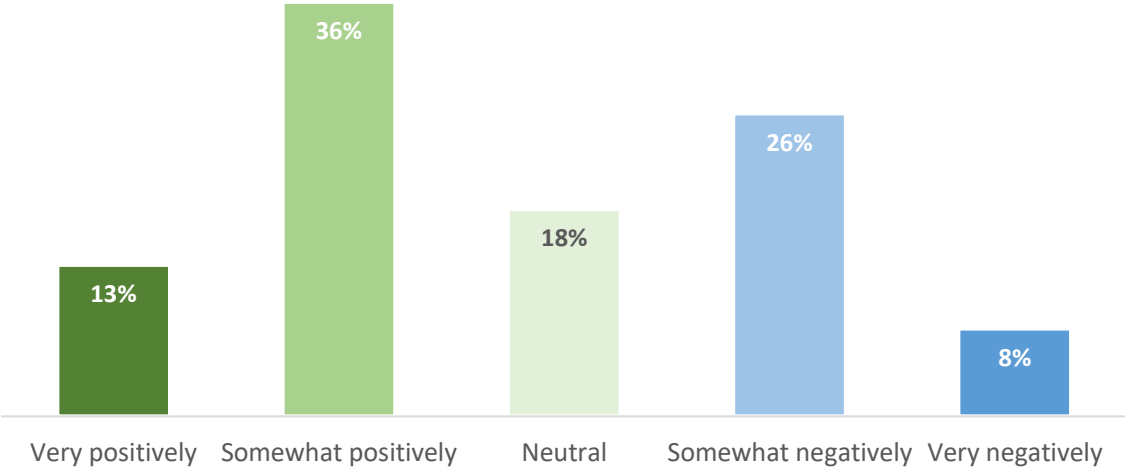


Figure 43: All considered, how has the carbon market affected your company financially? (n=146)

Selected quotes on how the carbon market has so far affected companies financially:

- Increased production costs have affected the company. – *Zhejiang steel producer*
- The group is deployed in a unified manner, and subsidiaries follow accordingly. – *Xinjiang power generator*
- The department responsible for carbon reduction technology for cement has taken many approaches, but the effect is not substantial. Reducing emissions is difficult. – *Chongqing cement company*
- Some small-scale production capacity was shut down, and the overall production capacity of the industrial chain was reduced, which caused a certain impact. – *Xinjiang chemicals company*
- The market has guided the company to plan and implement transformative energy-saving technology, and work to allocate more funds and management resources to help reduce carbon emissions. This is good for the future production, operations and financial situation. – *Inner Mongolia non-ferrous metals producer*

Unlike in most other jurisdictions with carbon pricing, China's electricity prices are currently fixed on an annual basis by the central government, with variations by region. This means that power generation companies cannot pass the carbon price on to consumers. Survey respondents were asked by what time they expect the carbon price to affect the price of electricity for consumers. Only 21% of respondents believe this will be the case by 2025, while more expect this reform to be achieved post-2030 than last year.

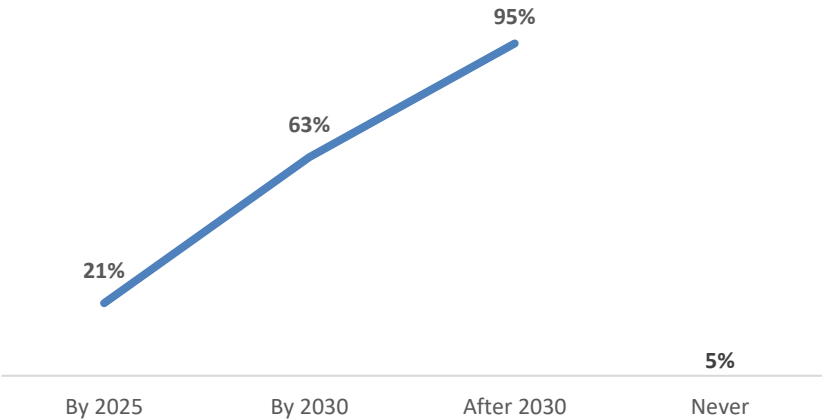


Figure 44: By when do you expect power market reform to allow for carbon price pass through from power producers to end users? (n=399)

Peak emissions

In September 2020, President Xi Jinping increased China's climate ambition by committing to peak its emissions of carbon dioxide from energy consumption 'before 2030' (instead of 'around 2030'). 43% of respondents to this year's expect China to achieve the carbon emissions peak before 2030. Only 13% expect China's emissions to peak by 2025 or earlier, down from 36% two years ago in the 2020 survey.

China is expected peak emissions before or no later than 2030

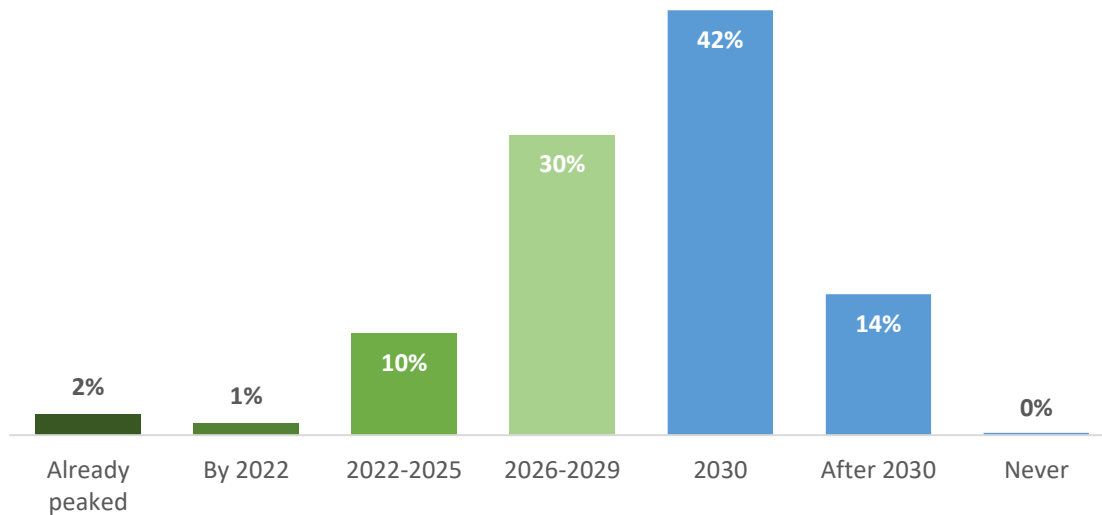


Figure 45: When do you expect China's emissions will peak? (n=434)

Carbon border adjustments

As climate change mitigation ambition increase globally, and the world is seeing rising carbon prices, especially in the European Union, there is increasing attention on the challenge of limiting carbon leakage. Avoiding carbon leakage is not solely a local economic concern, but also of relevance to the global decarbonisation agenda, because if emission reductions in some areas are offset by increases in others it will slow progress towards net-zero.

Respondents from the cement, steel, aluminium and chemicals were asked whether they exported to the EU, which is going to introduce a Carbon Border Adjustment Mechanism (CBAM), and if so, how well they understand the proposed measure and its implications for their industry.

17 of respondents in these sectors (12%) indicated that their companies are exporters from China to the EU. 41% of these said that they understood the CBAM moderately or very well, up from 30% in last year's survey, but it is notable that this is still a minority of those affected.

Europe's proposed Carbon Border Adjustment Mechanism (CBAM) is not yet well understood

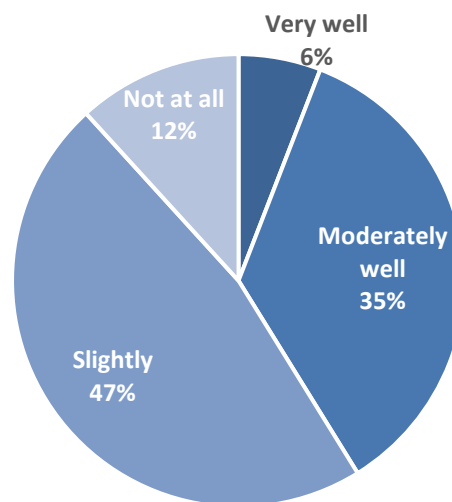


Figure 46: How well do you understand the EU's proposed CBAM (and its implications for your industry)? (n=20)

An even higher proportion of exporters expected that the CBAM will impact on their exports than in last year's survey (78% vs. 60%).

Exporters are concerned that the CBAM will impact their business

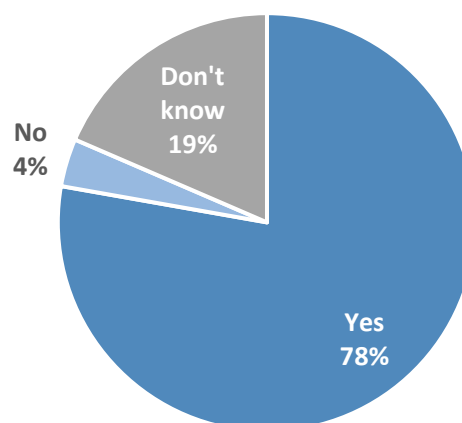


Figure 47: Do you anticipate that the CBAM will impact your exports to Europe? (n=20)

Project implementers

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

Project funders



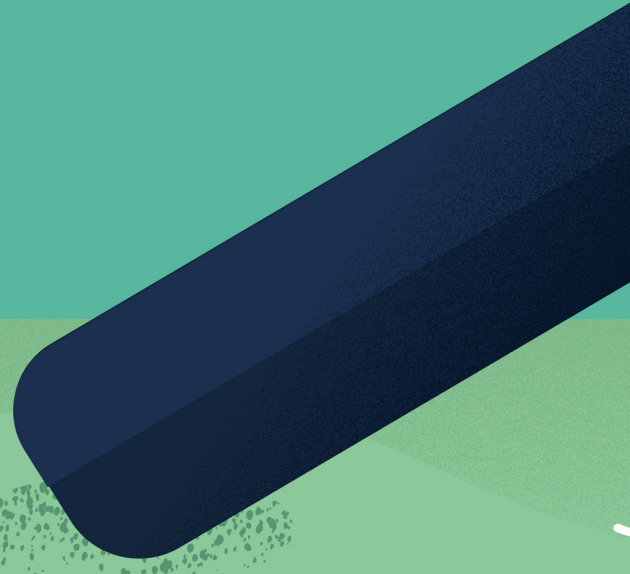
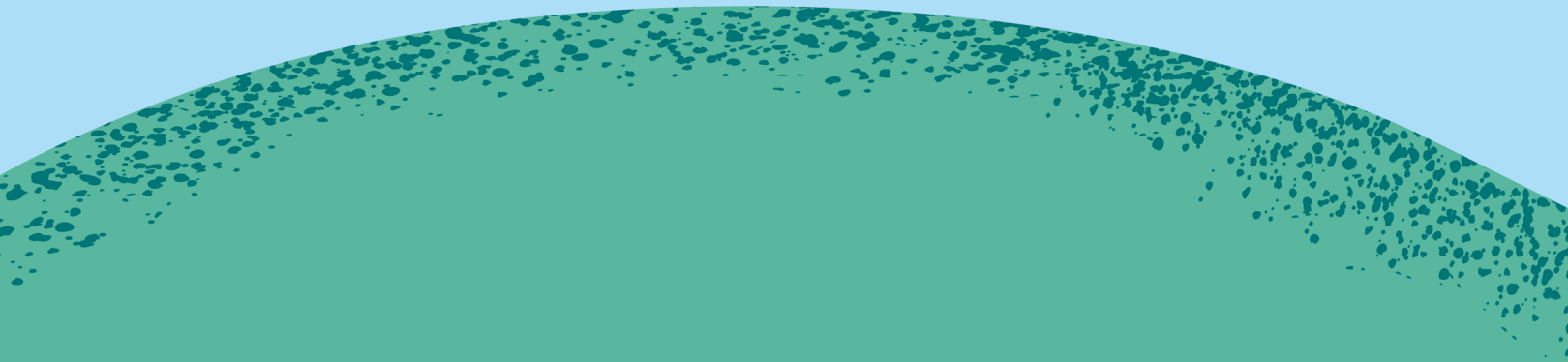
Founded in 1967 and headquartered in New York, Environmental Defense Fund (EDF) is one of the world's leading environmental organizations. EDF has more than 3 million members, a staff of over 1000 professionals, and 12 offices around the world including the United States, China, United Kingdom, Indonesia and Mexico. Areas that EDF works in include: climate and energy, oceans, ecosystems, health, etc. Since inception, EDF has been guided by principles of science and economics to find practical and lasting solutions to the most serious environmental problems. EDF has been working in China since 1991 and in June 2017, EDF became the first foreign NGO registered under the supervision of China's Ministry of Environmental Protection.



Energy Foundation is a professional grant-making charitable organization registered in California, U.S. It has been working in China since 1999 and is dedicated to China's sustainable energy development. The foundation's China office is registered with the Beijing Municipal Public Security Bureau and supervised by the National Development and Reform Commission of China. Our vision is to achieve prosperity and a safe climate through sustainable energy. Our mission is to achieve greenhouse gas emissions neutrality, world-class air quality, energy access, and green growth through transforming energy and optimizing economic structure. We deliver the mission by serving as a re-grantor, facilitator, and strategic advisor.



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.



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