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China Carbon Pricing Survey 2013

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Abstract

This paper summarises results from the inaugural China Carbon Pricing Survey. The survey elicited expectations about the future of China's carbon price from China-based experts on carbon pricing and carbon markets during July to September 2013. The results indicate confidence that all seven of China's pilot schemes will be implemented by 2015, with prices rising over time and having an effect on investment decisions; however there is significant uncertainty about price levels. There is strong confidence that China will proceed to introduce national emissions trading, probably in conjunction with a carbon tax. Carbon price levels are expected to rise, in time exceeding those currently prevailing in the EU emissions trading scheme. A large majority of respondents expect that China's 2020 emissions intensity target will be achieved or surpassed, and almost all expect further targets to be taken on in 2025 and 2030, possibly in the form of absolute limits on emissions.

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Keywords
Carbon pricing, emissions trading, carbon tax, public policy, expert survey, China

JEL Classification

Q52, Q54, Q58.

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Executive summary

This is a summary of results from the inaugural China Carbon Pricing Survey, jointly conducted by the Centre for Climate Economics and Policy at the Australian National University, and China Carbon Forum, a Beijing-based independent organization with the objective to foster trust and cooperation among China's stakeholders for climate action.

The survey, undertaken from late July to early September 2013, elicited expectations about the future of China's carbon price from 86 China-based experts on carbon pricing and carbon markets. The survey is a collective "best guess" by these experts. It is by nature not representative, 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. However it does provide a clear indication of dominant expert views on the likely future for China's carbon pricing.

The results indicate confidence that China's seven pilot emissions trading schemes (ETS) will be implemented, with prices rising over time and influencing investment decisions, however there is significant uncertainty about price levels. There is strong confidence that China will proceed to introduce national emissions trading, probably in combination with a carbon tax. Carbon price levels are expected to rise, in time exceeding those currently prevailing in the EU ETS. A large majority of respondents expect that China's 2020 emissions intensity target will be achieved or surpassed, and almost all expect further targets to be adopted in 2025 and 2030, possibly in the form of absolute limits on emissions.

The ETS pilots

The survey indicates that experts anticipate that all seven pilot schemes will become operational, although with further delays, and that price levels, while differing between the schemes, will rise quickly.

Over 80% of respondents expect that all seven ETS pilots will be in operation by the end of 2015, but almost half expect that this will not be achieved by the intended period of 2013-2014.

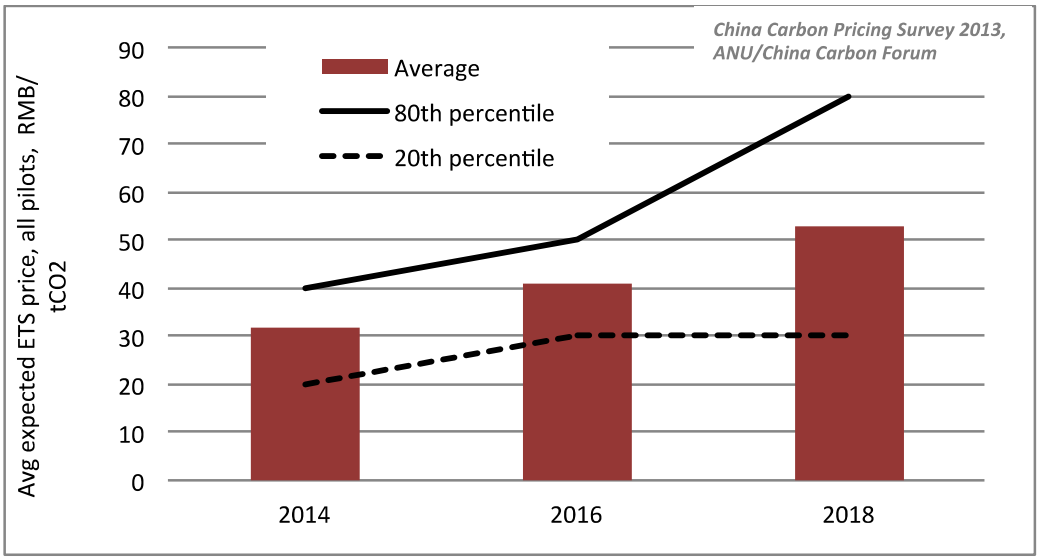
The average expected carbon price across all the ETS pilots that are in operation is RMB 32/t in 2014; RMB 41/t in 2016; and RMB 53/t in 2018. However there is significant uncertainty about price levels. The lowest 20% of responses expect prices of less than RMB 30/t in 2018, while the highest 20% expect prices higher than RMB 80/t in 2018.

On average, ETS pilots in Shenzhen, Shanghai, Beijing and Guangdong are expected to start sooner, and have higher carbon prices, than the schemes in Tianjin, Hubei and Chongqing.

With respect to the impact of the pilots on investment decisions, 84% of respondents expect them to affect investment decisions, although most expect this effect to be either 'moderate' or 'marginal', rather than 'strong'. Respondents to the Chinese language version of the survey were more confident that investment decisions would be affected.

Average prices in the pilot schemes are expected to rise, but price levels are highly uncertain

Question: What average carbon price do you expect to apply in the pilot schemes that are in operation, on average during 2014, 2016 and 2018 respectively?



National carbon pricing

The survey indicates clear expectations that China will follow through with its commitment to a national ETS, probably in conjunction with a carbon tax. Half of the respondents expect a national ETS to be in place at or before 2018, and over 80% believe a national ETS will exist by 2020.

Almost 60% expect that by 2020, both a national ETS and a carbon tax will be in place. Only 1% of respondents expect that China will never adopt a national ETS, while 15% expect that China will never adopt a carbon tax.

Price expectations meanwhile vary greatly between experts, suggesting that there is uncertainty about the nature and stringency of ETS and the response of the economy. Reflecting this uncertainty, many respondents (almost one third) chose not to provide price estimates.

For the national ETS, the average price expectation (factoring in no scheme and zero price expectations from some of the respondents) rises steadily from RMB 29/tCO_2 in 2018; to RMB 51/t in 2020; and RMB 68/t in 2025. The expected Chinese national ETS price in 2020 (equivalent to EUR 6/t) is above today's EU ETS price and just below the price of EU 2020 futures.

The average expected carbon tax level rises from RMB 7/t in 2016 to RMB 32/t in 2025.

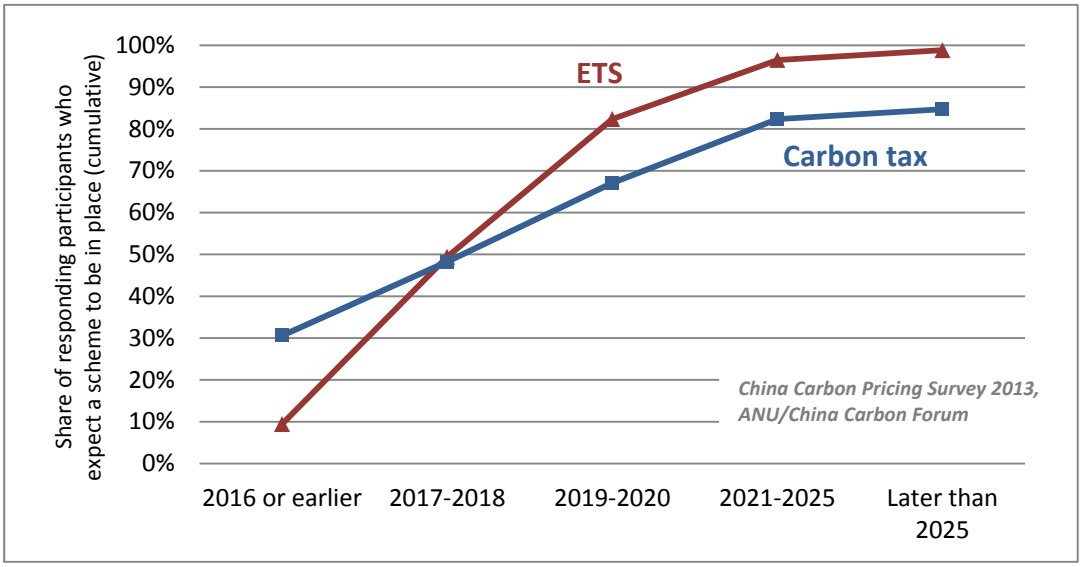
The combined average expected carbon price from ETS and carbon tax in 2020 is RMB 70/t (EUR 8.50/t, $11.50/t). The majority of respondents expect the overall price of carbon in China to be

lower than the EU ETS until 2020, however by 2025 a majority expects China's carbon price to be similar to or higher than the EU ETS price.

Over two thirds of respondents expect that by 2025, China's ETS will be linked with one or more emissions trading schemes in other countries.

Both a national ETS and carbon tax are expected to start by 2020

Questions: When do you expect that a national emissions trading scheme will start? By when do you expect that a national carbon tax will be in operation?



China's emissions targets

The survey indicates strong confidence that China's 2020 emissions target will be achieved or surpassed, that there will be post-2020 targets, and that there is an increasing likelihood of an absolute target replacing the intensity target approach.

The large majority of respondents (87%) expect that China will achieve or surpass its 2020 emissions intensity target of a 40-45% reduction in the ratio of emissions to GDP compared to the year 2005. Respondents to the Chinese language version of the survey were more confident of this than respondents to the English language version.

95% of respondents expect new targets to be adopted for 2025 and 2030. Over two thirds of respondents think that the 2030 target will be an absolute target, and almost half expect that an absolute target will already apply at 2020.

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Introduction

China is implementing its National Climate Change Programme, which includes mandatory national targets for reducing energy intensity and the discharge of major pollutants, increasing forest coverage and increasing the share of renewable energy. China's 12th Five Year Plan (2011-2015) lays out plans to "gradually develop a carbon trading market", and the government is investigating the adoption of a carbon tax. China is preparing pilot emission trading schemes (ETSs) in five cities (Beijing, Chongqing, Shanghai, Shenzhen, and Tianjin) and two provinces (Guangdong and Hubei). The first pilot scheme in Shenzhen started operation in June 2013.

Despite strong government commitment to specified emission reduction targets and official statements about the intention to introduce emissions trading and possibly a carbon tax, there is uncertainty as to the timing and form of carbon pricing in China. Each of the pilots ETSs will be designed with its own rules to allow experimentation, and the building blocks of many of the pilots have not been disclosed, so the price of carbon in each scheme is difficult to predict. There is also uncertainty regarding national level carbon pricing in the future. A national ETS, a carbon tax or both may be adopted, of which the timing, design elements and price levels are uncertain.

This report presents the results from the inaugural China Carbon Pricing Survey, jointly conducted by the Centre for Climate Economics and Policy (CCEP) at the Australian National University, and China Carbon Forum, a Beijing-based independent organization with the objective to foster trust and cooperation among China's stakeholders for climate action.

The survey gauges expectations by China-based experts about the future of China's carbon price, and how it will relate to international markets. It quantifies expectations about future prices and policy settings. As such, it can make an important contribution to the understanding of the financial markets and of policymakers of how the prospects for carbon pricing are perceived in the expert community.

The expectations about future carbon price levels elicited here 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 determine future prices. Owing to the nature of the exercise, there is no claim that the survey is representative of the views of all experts on the matter, 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 average expected 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.

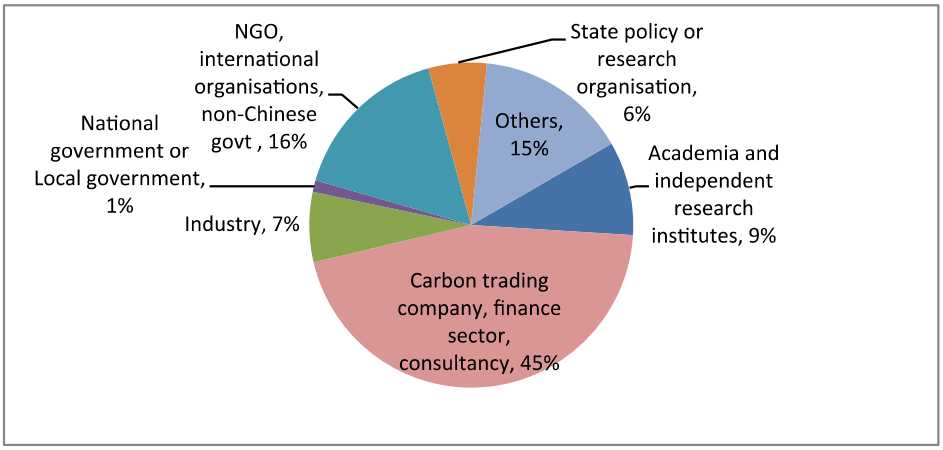
Surveying China's carbon pricing experts

The majority of people invited to participate in this expert survey were selected from China Carbon Forum's database of members, on the basis of their known roles working on carbon market issues for their organizations, or their known expertise on the subject matter. The project drew inspiration from the Australia Carbon Pricing Survey 2012, conducted by Australian National University's Centre for Climate Economics and Police (CCEP).

The survey was conducted anonymously through a secure website, from 25 July to 11 September 2013. Responses were received from 86 experts out of a total of 405 who were approached (representing a response rate of 21% which is normal for surveys of this kind). An English language and Chinese language version were made available, with 44 respondents using the Chinese version of the survey, and 42 respondents using the English version.[1]

Of the 86 respondents, 39 work for carbon trading companies, related entities in the financial sector, and consultancies. Typical expertise of these respondents include work on the Clean Development Mechanism (CDM), involvement in the EU ETS, and similar. 14 respondents work for NGOs that are active on emissions trading, international organizations, or diplomatic institutions; 8 are affiliated with academia and independent research institutes; 6 work for the Chinese government, or affiliated policy and research organizations; a further 6 respondents work in industry. Respondents self-identified which group they belonged to.

Survey participants by groups



Note: total number of responses n=86. See Appendix for details.

[1] Respondents were free to choose which version to use, so these two categories do not necessarily reflect the native language or nationality of respondents.

The survey does not lay claim to be representative. However, it covers a significant number of China's expert community on carbon markets, with particularly strong representation from carbon trading companies and consultancies. As such it probably provides a reasonable indication of views and expectations among the relevant community of experts.

The survey questions were divided into eight sections, in the order presented in this report. The Appendix to this report shows the exact wording of the survey questions, along with detailed survey statistics and some explanatory notes.

The pilot emissions trading schemes

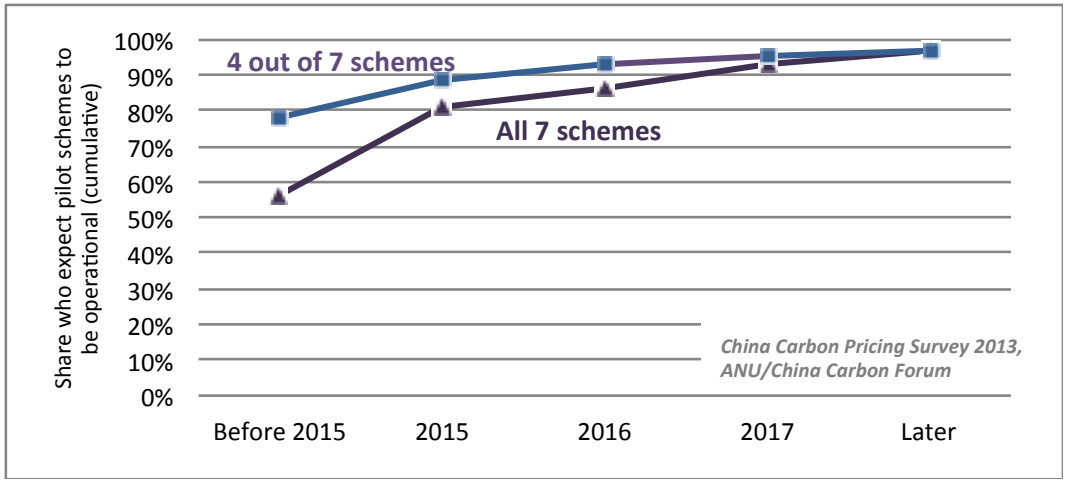
In October 2011, China's National Development and Reform Commission (NDRC) designated four municipalities (Beijing, Chongqing, Shanghai and Tianjin), two provinces (Guangdong and Hubei) and the special economic zone of Shenzhen City as regions for ETS pilots. NDRC's goal is for all of the seven ETS pilots to be operational in the period of 2013-2014.

Establishment of the seven pilot emission trading schemes

The survey results suggest that the expert community is confident that all pilot schemes will become operational, but many experts doubt that all will be in place by the end of 2014.

Experts were asked by when they expect all of the ETS pilots to be in operation, and by when they expect at least four out of seven of the ETS pilots to be in operation. Experts were also asked whether they expected each of the individual pilots to be in operation by the start of 2014.

Confident expectation that pilot schemes will be in place by 2015



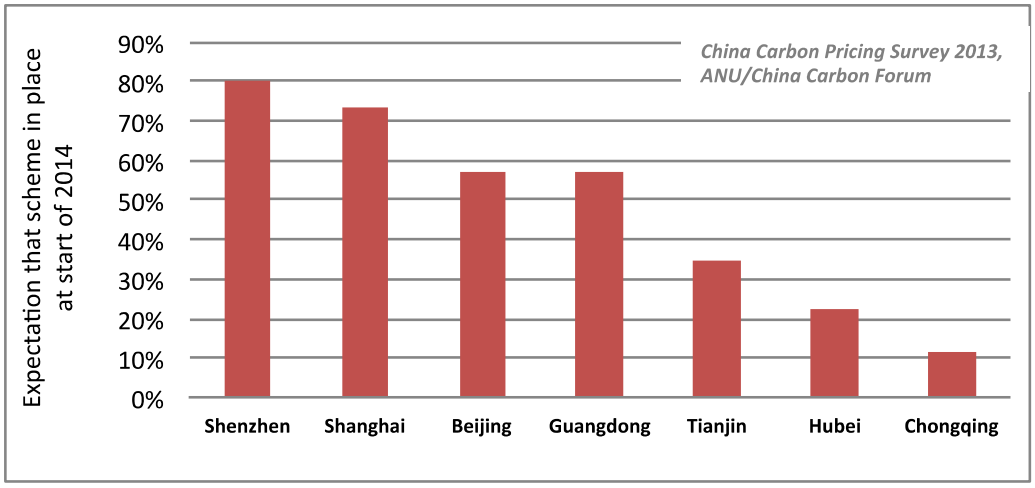
Q 3-4: By when do you expect that all seven schemes [4 out of 7 schemes] will be in operation?"
Chart shows cumulative percentage. See Appendix, questions 3 and 4.

56% of respondents expect that all seven pilots will be operational by the end of 2014, and 77% expect at least four to be operational by then. The bulk of respondents (81%) expect all seven pilots to be in operation by 2015. Only 7% expect that it will take longer than 2017 for all seven pilots to be in operation.

Expectations regarding the timing of each of the schemes differ significantly. Over 70% expect the Shenzhen and Shanghai schemes to be in operation by the start of 2014. Expectations for Beijing and Guangdong are also confident, with more than 50% of respondents expecting them to be in operation by then. However, the majority respondents expect Tianjin, Hubei and Chongqing to start operations after that time.

Chinese-language respondents were somewhat more optimistic: 61% of Chinese-language respondents expect all seven pilots to be operational by the end of 2014, compared to 50% of those using the English language version of the survey.

Shanghai and Shenzhen expected to be operational first, then Beijing and Guangdong, followed by the rest



Q5: Which of the pilot schemes do you expect to be in operation at the start of 2014?

Prices in the seven pilot emissions trading schemes

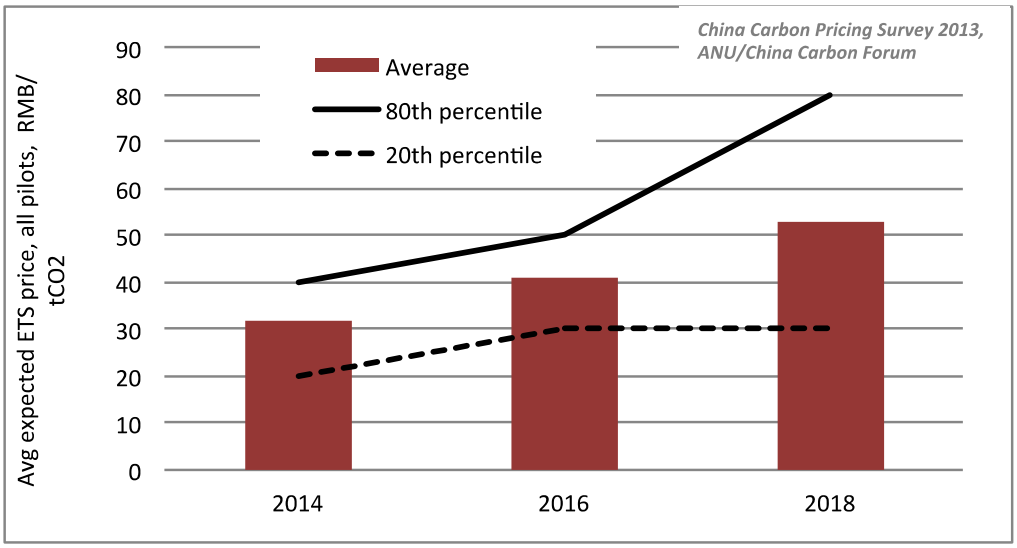
A key question for the effectiveness of the carbon price is the expectations which decision-makers in business form over future carbon prices.

Price expectations will be determined by expectations about the cap (amount of permits issued), the underlying emissions growth rate, the coverage of emissions sources by the scheme, the cost of abatement in industries covered, any provisions about price containment tools and mechanisms such as floor prices and ceiling prices, borrowing/banking of permits, linking, use of offset credits, and other factors.

The responses indicate an expectation of rising prices over time, but also a great extent of uncertainty about future price levels.

We asked our survey participants what average carbon price they expect to apply in the pilot schemes which are in operation, during 2014, 2016 and 2018. For 2014, the average expected carbon price is RMB 32/t (EUR 4/t, $5/t) of CO2-equivalent emissions for all seven pilots. The average expected price rises steadily from there onwards, to RMB 41/t in 2016 and RMB 53/t in 2018 (a 13% annual average rise in nominal prices from 2014 to 2018).

Average prices in the pilot schemes are expected to rise, but price levels are uncertain



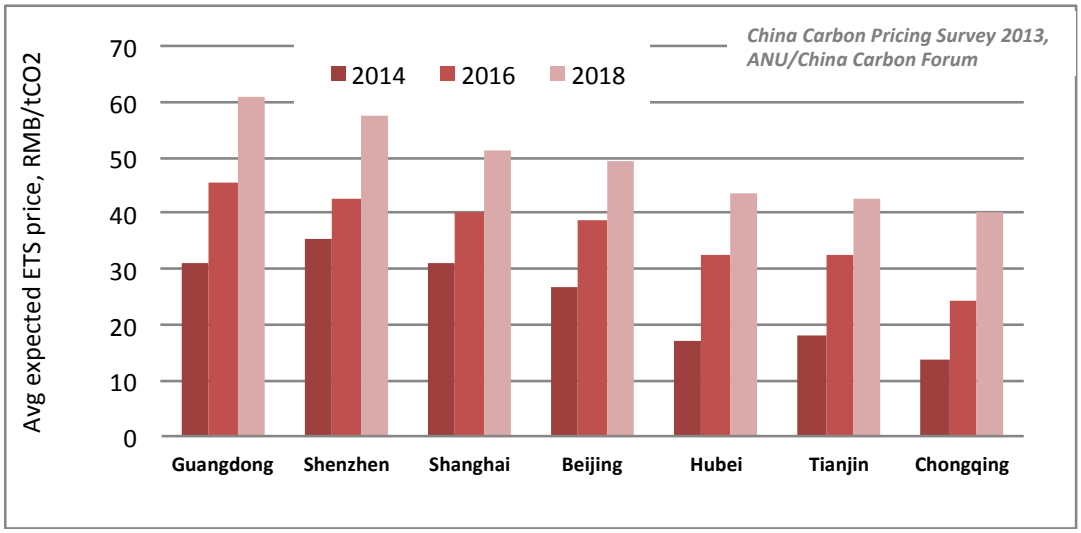
Q6: What average carbon price do you expect to apply in the pilot schemes that are in operation, on average during 2014, 2016 and 2018 respectively?
Note: Participants were allowed to leave blanks, which was interpreted to mean that they did not know what price to expect; these responses were excluded in computing the averages. By contrast if respondents entered "zero" this was included in computing averages.

The median price expectation is similar to the average in all years. Respondents generally expect a carbon price above zero – responses in the lowest 10th percentile are still up to RMB 20/t, and up to RMB 30/t in the 20th percentile. Responses in the 90th percentile expect a carbon price rising from RMB 60/t in 2014 to 100/t in 2018, and in the 80th percentile from RMB 40/t to 80/t over the same period.

For each of the years, about 66 responses were received versus about 20 blanks. In other words, a little under a quarter of respondents did not respond, suggesting that many participants had insufficient insight to give any price expectations. Differences in average expected prices between different groups of respondents are not statistically significant.

Participants were also asked if they had specific insights into one or more of the pilot schemes, and if so to provide price expectations. A minority of respondents answered this question, with about 70 – 80% blanks depending on the region. Expectations from those who did respond suggest higher prices in Shenzhen, Shanghai, Guangdong and Beijing (putting highest first), and lower prices in Tianjin, Hubei and Chongqing (putting lowest last).

Expected prices differ significantly between the pilot schemes



Q7-13: You may have specific insights into likely prices for one or more of the pilot schemes. If so, what average carbon price do you expect to apply, if you believe it will be in operation?
Note: a relatively small number of respondents answered this question.

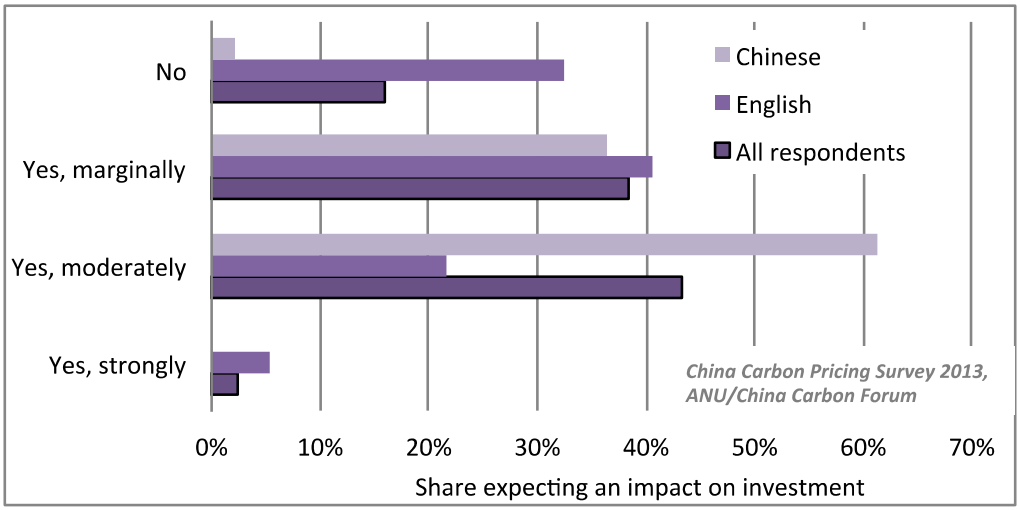
Participants were also asked which pilot scheme they believed would have the highest carbon price during 2014. 74 out of 86 responded to this question. Shenzhen was chosen most frequently (by 30%), while Beijing (23%), Shanghai (23%) and Guangdong (22%) were also expected by many to have the highest carbon prices during 2014.

Impacts of the pilot schemes on investment

Respondents were asked if they expected the pilot schemes to affect investment decisions in the sectors covered by the pilots. The large majority do expect the pilots to affect investment decisions: 2% expect investment decisions to be strongly affected, 43% expect investment decisions to be moderately affected, and 38% expect investment decisions to be marginally affected. 16% expect investment decisions to be unaffected.

Chinese-language respondents expect heavier impacts than English-language respondents. 61% of Chinese-language respondents expect investment decisions to be strongly or moderately affected, whereas only 27% of English-language respondents agreed. 32% of English-language respondents expect the investment decisions to be unaffected entirely, whereas only 2% of Chinese-language respondents think there will be no impact on investment.

Investment decisions affected somewhat by the carbon price; Chinese language respondents more confident of investment impact



Q15. Given your expectations about prices in the pilot schemes, do you expect them to affect investment decisions in the sectors covered by the pilot schemes?

National emissions trading and carbon tax

The seven ETS pilots are intended to lay the groundwork for the adoption of a national emissions trading system. There have also been reports on the possible introduction of a carbon tax in China. However, it remains uncertain which of these national initiatives will be adopted, and when. There is also uncertainty about the pricing in such schemes.

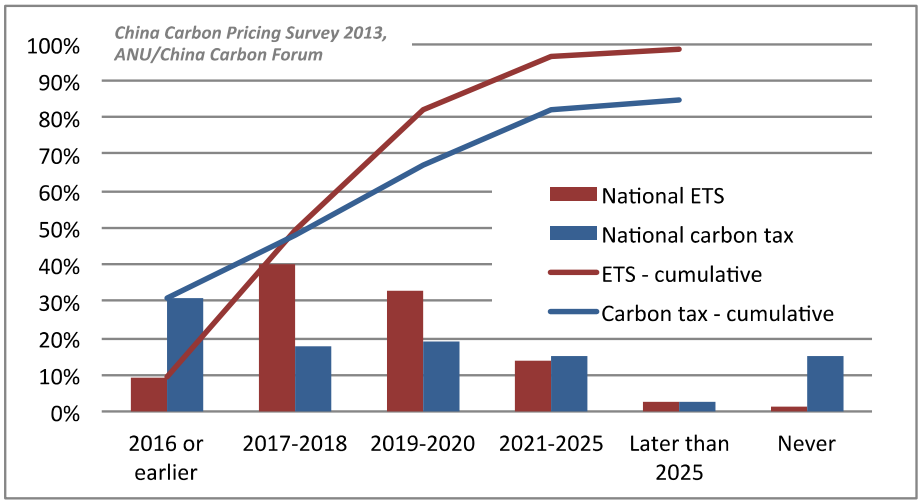
Start of national ETS and carbon tax

Survey participants were asked by when they expect a national ETS to start, and by when they expect a national carbon tax to be in operation (as either an alternative or in addition to an ETS). They were then asked about their price expectations for such schemes.

85 out of 86 respondents answered the questions about when a national ETS and/or tax might start. Of those, only 9% expect the national ETS to be started by the end of 2016, while 31% expect a carbon tax to be in operation by that time. If a national initiative is adopted soon, experts expect a carbon tax to be more likely.

The majority of respondents (60%) expect that China will have both a national ETS and a carbon tax in operation by 2020. 83% of respondents expect that China will adopt a national ETS before the end of 2020, and 67% of respondents expect a carbon tax to be in operation by 2020. Only 1% of respondents expect that China will never adopt a national ETS, while 15% expect that China will never adopt a carbon tax.

National emissions trading and a carbon tax are both expected to be introduced



Q16. When do you expect that a national emissions trading scheme will start? Q17. By when do you expect that a national carbon tax will be in operation? Note: this could be as an alternative or in addition to an emissions trading scheme. The bars in the graph show the expected time of introduction of each mechanism, the lines show the implied cumulative probability of the respective instruments being in place at different points in time.

Prices in national ETS and carbon taxation

Experts were asked what they expect the average carbon price to be at different points in time in a national ETS in China. They were subsequently asked what carbon tax level they expect to apply at different points in time. The results indicate an expectation of rapidly rising prices, but with significant uncertainty over the levels.

Indeed, as a sign of this uncertainty, almost one third of respondents did not answer the questions about price levels. As would be expected from the results of the previous questions, a significant number of respondents entered "0", as they do not expect a national ETS or carbon tax to be in place, particularly in the period up to 2018.

For a national ETS, the average price expectation (including "zero" answers which result in a lower average carbon price)[2] is RMB 15/t in 2016; RMB 29/t in 2018; RMB 51/t in 2020; and RMB 68/t in 2025. There is wide variation in the individual responses: at 2020, the 20th percentile is RMB 24/t and the 80th percentile is RMB 80/t.

[2] Responses to the questions about price expectations were cross-checked with the question on expectation whether an ETS (Q16; or carbon tax, Q17) would exist at a particular point in time. Whenever a respondent indicated that she or he expected that a scheme was not going to be in existence for a particular year, then a zero carbon price was used for the purpose of computing averages, even if the response to the "price" question was blank. Using only the numerical estimates (Q18) without cross-checking the responses about existence yields slightly higher averages, because some respondents left fields blank rather than entering "zero" responses.

The expected ETS price is not an indicator of relative economy-wide effort, because the price in the ETS does not reflect the effect of non-pricing policies; in fact the price in an ETS will tend to be lower if a given target is achieved with the use of a greater extent of direct regulation.

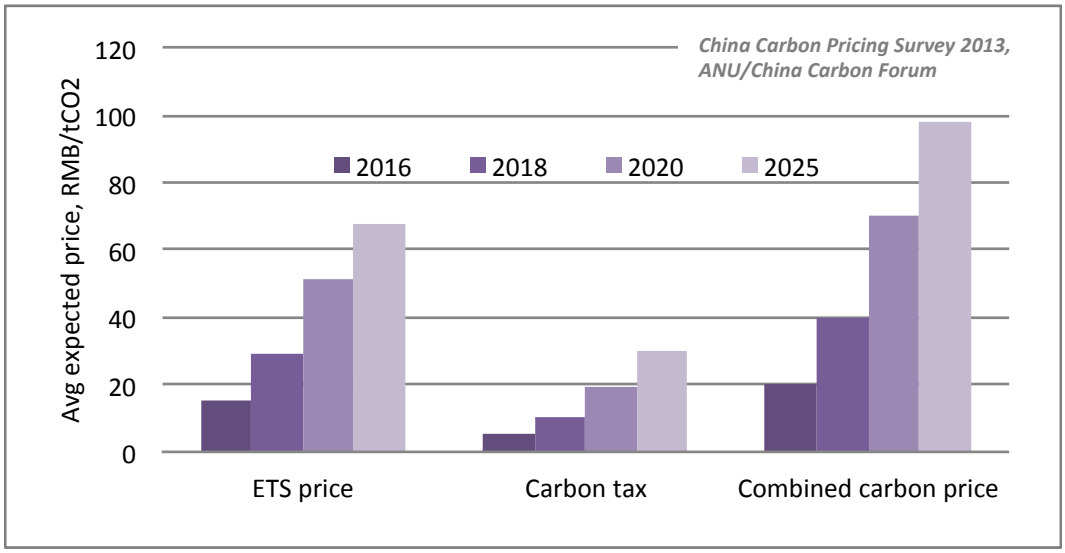
For the national carbon tax, the average expected price (again including "zero" responses) rises from RMB 6/t in 2016 to RMB 19/t in 2020 and RMB 30/t in 2025.

The combined average expected carbon price from ETS and carbon tax is RMB 70/t (EUR 9/t, $12/t) in 2020. It rises from RMB 40/t in 2018 to RMB 98/t in 2025.

Looking only at those responses that expect an ETS to be in place at the various points in time (thus excluding "zero" prices), the average expected price rises from RMB 38/t in 2016 to RMB 60/t in 2020 and RMB 74/t in 2025.

The average expected level of a carbon tax, again counting only those responses that expect a carbon tax to be in place, are RMB 19/t in 2016, RMB 33/t in 2020, and RMB 44/t in 2025.

Expected prices under national ETS and carbon tax rise quickly



Q18: What average carbon price do you expect to apply at different points in time, in a national emissions trading scheme for China? Q19: What carbon tax level do you expect to apply at different points in time, in a national carbon tax for China?

Comparing prices with the EU ETS

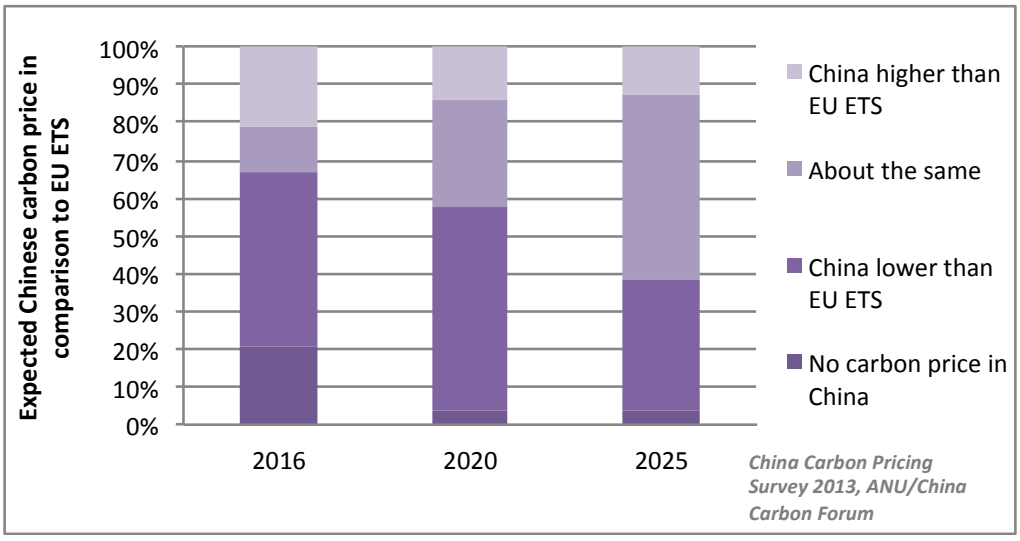
The relative price of carbon emissions between national emission trading schemes in various countries in part reflect the relative level of ambition in reducing emissions. Experts were asked if they expect the effective price of carbon (from emissions trading and/or a carbon tax) in China to be lower, higher, or about the same as the EU ETS price, in various years.

The results indicate that the majority of the experts expect China's emissions trading prices to be below Europe's prices in the near term, but to be on par with or higher than Europe's by the 2020s.

In 2016, 21% of respondents expect there to be no carbon price in China; 46% expect a price lower than the EU ETS; 12% expect a similar price in China and the EU; while 21% expect prices in China to be higher in that year. Remarkably, a third of the respondents expect prices in China to be higher or similar to the EU ETS in 2016. By 2020, just over half expect a price lower than in the EU ETS; 29% expect a similar price in China and the EU; while 14% expect prices in China to be higher. By 2025, half expect a similar price in China and the EU; while 13% expect prices in China to be higher in that year.

Combined with the estimates for national ETS prices, this would imply lower EU ETS prices than many analysts currently expect for the 2020s, however this should not be taken as an expectation of EU ETS prices because the survey did not ask that question directly.

China's carbon prices expected to align with EU ETS prices over time



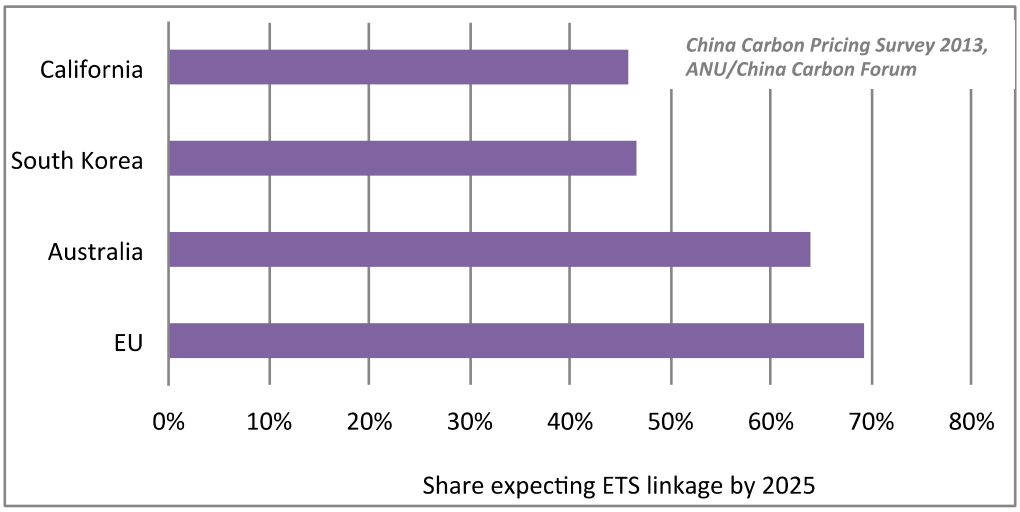
Q20-22 Thinking about the comparison with the EU ETS. Do you expect the effective carbon price (from emissions trading and/or a carbon tax) in China to be lower, higher or about the same as the EU ETS price?

Linking China's national ETS with other schemes

In principle, emissions trading schemes in different jurisdictions can be linked with each other, by making permits from one scheme eligible in another. Barring any restrictions on permit trade, this would result in the same price applying in the linked ETS's, and in cross-border financial flows for permits. Advantages are greater overall cost effectiveness, because of harmonisation of marginal mitigation costs; being able to differentiate targets between jurisdictions without sacrificing cost effectiveness; and greater market depth. But linking requires harmonisation of rules, mutual acceptance of the scheme caps (amount of permits issued by governments) and reliable emissions accounting and enforcement in all participating jurisdictions. A future Chinese ETS could potentially link up with other schemes internationally.

Participants were asked if they expect China's national ETS to be linked with the ETS's in the EU, Australia, South Korea, California, or "other" schemes by the year 2025. Around two thirds of respondents expect a link with the EU ETS and an Australian scheme,[3] and just under half a link with the ETSs in South Korea and California.

International linking expected by 2025



Q23-27 Do you expect that a Chinese national scheme will be linked with any other schemes by the year 2025? [list as per chart] Note: Six respondents said they expect links with other schemes: Japan (3), New Zealand (1), USA (1), and Kazakhstan (1).

[3] The survey was conducted before the Australian federal election which resulted in a change in government, with the new government committed to repealing Australia's carbon pricing scheme which would also imply no links with other emissions trading schemes.

China's national emissions targets

China has set a national emissions intensity (CO_2 emissions divided by GDP) target for 2020. The goal is to reduce emissions intensity by 40 to 45% by 2020 as compared to 2005. An intensity target means that the absolute amount of "allowable" emissions increases if GDP growth is faster, and decreases if GDP grows more slowly. China has long resisted the adoption of an absolute emissions target; however there have been announcements about an absolute cap on the total amount of coal used. All developed countries have framed their emissions reductions targets in absolute terms; India also has an intensity target.

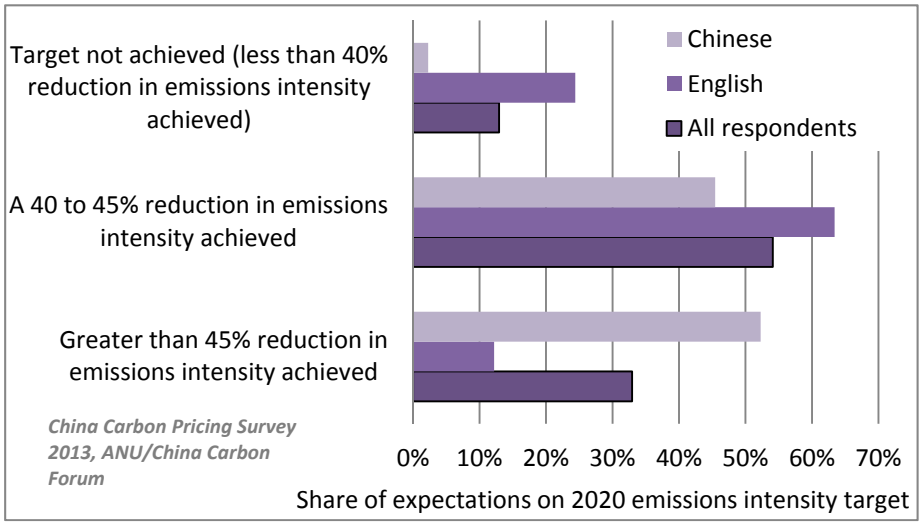
Experts were asked if they expect that the 2020 emissions intensity target will be achieved, whether they expect that an absolute target will be taken on for 2020, and whether and what form of target they expect to apply in 2020 and 2025.

The responses indicate strong confidence that the existing 2020 target will be achieved or surpassed and that further emissions targets will be set for 2025 and 2030; and that there is an increasing likelihood that China will take on an absolute emissions target rather than an intensity target.

The overwhelming majority of respondents (87%) expect that China will achieve or surpass its emissions intensity target: 54% expect the target to be achieved, while 33% believe the target will be surpassed (a greater reduction in emissions intensity than 45%). Only 13% think that the target will not be achieved.

Respondents to the Chinese language version of the survey were considerably more confident about achieving the 2020 target. Over half in this sub-group expect that China will do better than the 45% reduction in emissions intensity target, and only 2% think China will not achieve a 40% reduction in emissions intensity.

Confident expectation that the 2020 target will be met or overachieved

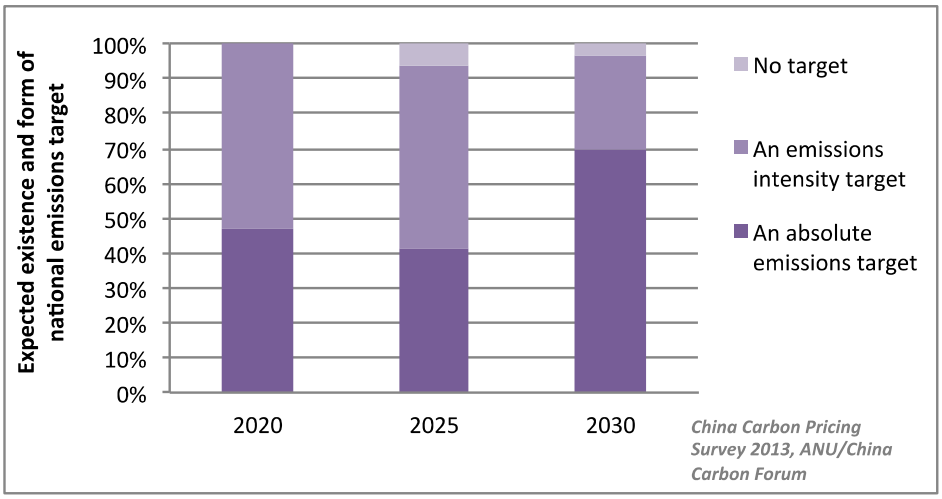


Q28. Do you expect that the 2020 emissions intensity target will be achieved?

Respondents were split on whether China will specify an absolute emissions target for 2020, with just under half expecting an absolute emissions target, and the remainder expecting no such target. Again, there was a significant difference between the two groups, with 60% of Chinese-language respondents expecting an absolute target for 2020, but only a third of the English language respondents expecting an absolute target for that year.

Finally, experts were asked if they expect that China will take on an emissions target for 2025 and for 2030, and if so what type. For 2025 and 2030, the vast majority of respondents expect targets to be adopted (94% and 96% respectively). For 2025, 41% expect this to be an absolute target, and 69% for 2030.

Strong confidence there will be post-2020 targets, increasing likelihood of an absolute target



Q30-31. Do you expect that China will take on an emissions target for 2025 [2030] and if so of what type?

Appendix: Survey questions and aggregated responses

Respondents' background

Q1-2 Which sector do you work in?

Sector	Responses	Percentage
Academia and independent research institutes	8	9%
Carbon trading company, finance sector, consultancy	39	45%
Industry	6	7%
National government or Local government	1	1%
NGO, international organizations, other national governments	14	16%
State policy or research organization	5	6%
Others	13	15%
Total	86	100%

"Others" included: European Utility; EU compliance buyer; Media; IETA; Entrepreneurs; Financial Systems Analysts; Trade Union; Financial securities; New Energy enterprise.

Establishment of the seven pilot emission trading schemes

Thinking about China's seven pilot schemes for emissions trading, and when they will start.
Q3. By when do you expect that all seven schemes will be in operation?;
Q4. By when do you expect that at least four out of the seven schemes will be in operation?

	Q3		Q4	
	Responses	Percentage	Responses	Percentage
Before 2015	48	56%	67	78%
2015	22	26%	9	10%
2016	4	5%	4	5%
2017	6	7%	2	2%
Later	3	3%	1	1%
Never	3	3%	1	1%
Blank	0	0%	2	2%
Total	86	100%	86	100%

Q5: Which of the pilot schemes do you expect to be in operation at the start of 2014?

	Beijing	Chongqing	Guangdong	Hubei	Shanghai	Shenzhen	Tianjin
Response Yes	49	10	49	19	63	69	30
Response No	37	76	37	67	23	17	56
Total	86	86	86	86	86	86	86
Percentage Yes	57%	12%	57%	22%	73%	80%	35%
Percentage No	43%	88%	43%	78%	27%	20%	65%
Total	100%	100%	100%	100%	100%	100%	100%

Prices in the seven pilot emissions trading schemes

Q6: What average carbon price do you expect to apply in the pilot schemes that are in operation, on average during 2014, 2016 and 2018 respectively?

	Question 6 (all pilots)		
	2014	2016	2018
Average price (RMB/tCO_2)	32	41	53
Median price (RMB/tCO_2)	30	40	50
Standard Deviation	19	20	29
10^{th} percentile	10	20	17
20^{th} percentile	20	30	30
80^{th} percentile	40	50	80
90^{th} percentile	60	70	100
Number of Responses	*67*	*66*	*65*

Q7-13: You may have specific insights into likely prices for one or more of the pilot schemes. If so, what average carbon price do you expect to apply, if you believe it will be in operation?

	Question 7 (Beijing)			Question 8 (Chongqing)			Question 9 (Guangdong)			Question 10 (Hubei)			Question 11 (Shanghai)			Question 12 (Shenzhen)			Question 13 (Tianjin)		
	2014	2016	2018	2014	2016	2018	2014	2016	2018	2014	2016	2018	2014	2016	2018	2014	2016	2018	2014	2016	2018
Average price (RMB/tonne)	27	39	49	14	25	40	31	45	61	17	33	43	31	40	51	35	43	57	18	33	42
Median price (RMB/tonne)	30	40	50	15	30	30	30	45	53	18	30	38	30	35	40	33	38	50	15	35	40
Std Deviation	15	16	27	13	15	29	24	24	34	15	17	28	15	18	28	19	20	34	17	19	28
10th percentile	8	16	15	0	4	12	0	17	21	0	10	14	17	22	18	9	20	21	0	9	11
20th percentile	16	30	30	0	10	19	5	30	32	0	20	24	20	30	30	23	30	30	0	12	16
80th percentile	39	50	80	26	40	54	50	60	100	30	50	60	40	50	80	50	56	92	30	48	58
90th percentile	40	60	80	30	40	88	61	68	100	32	50	86	57	59	96	62	80	100	38	53	84
Nr. of responses	*22*	*22*	*21*	*15*	*16*	*15*	*24*	*23*	*22*	*18*	*19*	*18*	*24*	*24*	*23*	*28*	*28*	*25*	*19*	*18*	*17*

Q14. Which of the pilot schemes do you expect to have the highest carbon price on average during 2014?

	Number of responses	Percentage
Shenzhen	22	30%
Beijing	17	23%
Guangdong	17	23%
Shanghai	16	22%
Hubei	1	1%
Tianjin	1	1%
Blank	12	not included
Total	86	100%

Impacts of the pilot schemes on investment

Q15. Given your expectations about prices in the pilot schemes, do you expect them to affect investment decisions in the sectors covered by the pilot schemes?

	Number of responses			Percentage		
	Chinese Language	English Language	All respondents	Chinese Language	English Language	All respondents
No	1	12	13	2%	32%	16%
Yes, marginally	16	15	31	36%	41%	38%
Yes, moderately	27	8	35	61%	22%	43%
Yes, strongly	0	2	2	0%	5%	2%
Blank	0	5	5	not included	not included	not included
Total responses	44	42	86	100%	100%	100%

Start of national ETS and carbon tax

Q16. When do you expect that a national emissions trading scheme will start?;
Q17. By when do you expect that a national carbon tax will be in operation? Note: this could be as an alternative or in addition to an emissions trading scheme.

	Question 16 - National ETS		Question 17 - National carbon tax		Cumulative Probability	
	Response	Percentage	Response	Percentage	National ETS	National carbon tax
2016 or earlier	8	7%	26	31%	9%	31%
2017 or 2018	34	44%	15	18%	49%	48%
2019 or 2020	28	29%	16	19%	82%	67%
2021 to 2025	12	12%	13	15%	96%	82%
Later than 2025	2	5%	2	2%	99%	85%
Never	1	2%	13	15%	1%	15%
Blank	1	not included	1	not included	not included	not included
Total	86	100%	86	100%	100%	100%

Prices in national ETS and carbon taxation

Q18: What average carbon price do you expect to apply at different points in time, in a national emissions trading scheme for China? (in yuan per tonne of CO2);
Q19: What carbon tax level do you expect to apply at different points in time, in a national carbon tax for China? (in yuan per tonne of CO2).

	Question 18 National ETS				Question 19 National carbon tax			
	2016	2018	2020	2025	2016	2018	2020	2025
Average price (RMB/tCO_2)	15	29	51	68	6	11	19	30
Median price (RMB/tCO_2)	10	30	50	55	0	9	15	23
Non- 0 Average price (RMB/tCO_2)	38	49	60	74	19	24	33	44
Standard Deviation	23	32	37	50	12	17	25	38
20th percentile	0	0	24	30	0	0	0	0
80th percentile	40	60	80	100	10	28	31	50
Number of Responses	*63*	*63*	*62*	*59*	*58*	*58*	*56*	*56*

Computed from answers to Q18 and Q19:

	2016	2018	2020	2025
Combined Carbon Price (RMB/tCO_2)	20	40	70	98

Comparison with the EU

Q20-22 Thinking about the comparison with the EU ETS. Do you expect the effective carbon price (from emissions trading and/or a carbon tax) in China to be lower, higher or about the same as the EU ETS price?

	Number of responses			Percentage		
	2016	2020	2025	2016	2020	2025
China higher than EU ETS	17	11	10	21%	14%	13%
About the same	10	23	38	12%	29%	49%
China lower than EU ETS	37	43	27	46%	54%	35%
No carbon price in China	17	3	3	21%	4%	4%
Blank	5	6	8	not included	not included	not included
Total	86	86	86	100%	100%	100%

Linking China's national ETS with other schemes

Q23-27 Do you expect that a Chinese national scheme will be linked with any other schemes by the year 2025?

	Number of responses				Percentage			
	California	South Korea	Australia	EU ETS	California	South Korea	Australia	EU ETS
Yes	32	34	48	54	46%	47%	64%	69%
No	38	39	27	24	54%	53%	36%	31%
Blank	16	13	11	8	not included	not included	not included	not included
Total	86	86	86	86	100%	100%	100%	100%

Note: Six respondents said they expect links with other schemes: Japan (3), New Zealand (1), USA (1), Kazakhstan (1).

China's national emissions targets

Q28. Do you expect that the 2020 emissions intensity target will be achieved?

	Number of responses			Percentage		
	Chinese language	English language	All respon-dents	Chinese language	English language	All respon-dents
Target not achieved (less than 40% reduction in emissions intensity achieved)	1	10	11	2%	24%	13%
Yes, a 40 to 45% reduction in emissions intensity achieved	20	26	46	45%	63%	54%
Greater than 45% reduction in emissions intensity achieved	23	5	28	52%	12%	33%
Blank	0	1	1	not included	not included	not included
Total	44	42	86	100%	100%	100%

Q29. Do you expect that China will specify an absolute emissions target for 2020?

	Number of responses			Percentage		
	Chinese language	English language	All respondents	Chinese language	English language	All respondents
Yes	26	14	40	59%	34%	47%
No	18	27	45	41%	66%	52%
Blank	0	1	1	not included	not included	not included
Total	44	42	86	100%	100%	100%

Q30-31. Do you expect that China will take on an emissions target for 2025 and 2030, and if so, what type?

	Number of responses		Percentage	
	2025	2030	2025	2030
No target	5	3	6%	4%
An emissions intensity target	45	23	53%	27%
An absolute emissions target	35	59	41%	69%
Blank	1	1	not included	not included
Total	86	86	100%	100%