What are the implications of China’s carbon emissions trading scheme?

**What is the scheme about?**
China’s national carbon emissions trading scheme (ETS) was launched by the Ministry of Ecology and Environment (MEE) in mid-July and is the world’s largest carbon market by volume.1 Managed by the Shanghai Environment and Energy Exchange, it brings together eight municipal and provincial pilot schemes2 that have been in effect since 2013 (see Chart 1).

**Chart 1 - China’s national ETS trading went live on 16 July after ten years of development**

The first phase of the ETS covers 2,225 coal- and gas-fired power plants accounting for about 40% of national emissions. Participating companies are allocated a certain number of free emissions permits up to a set cap (a function of historical power and heat output, government-determined emission intensity benchmarks, and other adjustment factors).3 They can then either buy or sell allowances if their emissions remain below or exceed this cap.

Unlike the European Union’s Emissions Trading System (EU ETS), the allocation of permits in China’s ETS will be based on “carbon intensity” (see comparison in Table 1). This looks at the amount of emissions per unit of power generated rather than an absolute level of emissions.4 Some critics argue this may reduce the effectiveness of the scheme as absolute emissions can still increase as energy output increases. On the other hand, this model can ease concerns over constraints on economic growth that could result from reduced power consumption.

2. China’s ETS brings together pilot schemes in five municipalities (Beijing, Shanghai, Tianjin, Chongqing and Shenzhen) and three provinces (Hubei, Guangdong and Fujian).
3. Asia Summer School: China’s National Emissions Trading Scheme Investor Presentation, Morgan Stanley, July 2021

---

This document is for Professional Clients only in Dubai, Jersey, Guernsey, the Isle of Man, Ireland, Continental Europe (as defined in the important information at the end) and the UK; for Institutional Investors only in the United States, for Sophisticated or Professional Investors in Australia; in New Zealand for wholesale investors; in Japan for Qualified Institutional Investors; in Taiwan for Qualified Institutions/Sophisticated Investors; in Singapore for Institutional/Accredited Investors; for Qualified Institutional Investors and/or certain specific institutional investors in Malaysia upon request; for certain specific institutional investors in Brunei; for Qualified Professional Investors in Korea; in Canada, this document is restricted to Accredited Investors as defined under National Instrument 45-106. It is not intended for and should not be distributed to or relied upon by the public or retail investors. Please do not redistribute this document.
## What are the implications of China’s carbon emissions trading scheme?

**Invesco Investment Insights**  
September 2021

### Table 1 - Comparison between China’s ETS and EU ETS

<table>
<thead>
<tr>
<th>Details</th>
<th>China National ETS</th>
<th>EU ETS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year of Introduction</strong></td>
<td>2021</td>
<td>2005</td>
</tr>
<tr>
<td><strong>Sector Coverage</strong></td>
<td>Power and heat generation; cement and electrolytic aluminum producers might follow by 2022</td>
<td>Power stations and other combustion plants ≥20MW, Oil refineries, Coke ovens, Iron and steel plants, Cement clinker, Glass, Lime, Bricks, Ceramics, Pulp, Paper and board, Aluminum, Petrochemicals, Aviation, Maritime Transport (to be included from 2023). Emissions trading for building and road transport to be introduced through separate but adjacent emissions trading</td>
</tr>
<tr>
<td><strong>GHG Coverage</strong></td>
<td>Verification guideline specifies that the ETS covers CO2 emissions, unclear as to whether this would be expanded to other GHGs in the future</td>
<td>CO2, N2O, PFC from aluminum production</td>
</tr>
<tr>
<td><strong>Allocation Mechanism</strong></td>
<td>Free allocation only</td>
<td>Primarily auctioning</td>
</tr>
<tr>
<td><strong>Emissions Cap</strong></td>
<td>No absolute cap nor declining emission targets; calculated as total of verified emissions across all covered entities</td>
<td>Absolute cap and declines annually, Phase 4 (2021-2030): 1.57% per Mt CO2 in 2021; annual Linear Reduction Factor to become 4.2%</td>
</tr>
<tr>
<td><strong>Offsets</strong></td>
<td>China Certified Emissions Reduction (CCERs) for offsetting up to 5% of verified emissions per year</td>
<td>Clean Development Mechanism (CDM) credits and Joint Implementation (JI) credits, subject to quantitative and qualitative limits, largely phased out in 2014</td>
</tr>
<tr>
<td><strong>Compliance Obligation</strong></td>
<td>Compliance obligation capped at 20% above verified emissions for coal power plants and at verified emissions for gas fired power plants</td>
<td>No cap of compliance obligations</td>
</tr>
<tr>
<td><strong>Penalties</strong></td>
<td>Entities which fail to surrender allowances as required would be subject to maximum penalties of Rmb 30,000. The shortfall needs to be surrendered; it would be deducted from the allocated allowances of the next year</td>
<td>Buy additional allowances from the market or pay a penalty €100/tCO2</td>
</tr>
<tr>
<td><strong>Price Adjustment Mechanisms</strong></td>
<td>Price volatility limited to 10% (or 30% for block trades) initially</td>
<td>Market Stability Reserve for reducing oversupply of ETS surplus</td>
</tr>
</tbody>
</table>

Source: MEE, International Carbon Action Partnership (ICAP), European Union, MS Research

In the future, the ETS is expected to expand to cover other sectors aside from power, including petrochemicals, chemicals, building materials, steel, nonferrous metals, paper, and domestic aviation. The way in which the government will choose to allocate carbon emissions quotas for other industries is still unknown.

China’s Metallurgical Industry Planning and Research Institute (MPI) is currently working on several issues related to incorporating the steel industry into the ETS. To better understand and address the challenges domestic steel mills are facing and appeals they have, the MPI is soliciting opinions and suggestions in areas such as quota assignment, working mechanism testing, market inspection, and low-carbon standard system set-up.

### What is the expected impact?

We expect the short-term impact of the ETS to be quite limited as the aim is to enable a smooth transition from the earlier pilot schemes. The government needs to incentivize companies to reduce their carbon footprint without hurting the competitiveness of the overall industry or disrupting economic activities. As a result, we foresee that carbon prices will be low in the short run as compared to other schemes globally. However, it is worth noting that even when the EU ETS started in 2005, it faced teething issues. Emitters were encouraged to inflate their emissions due to a lack of reliable baseline data and carbon prices remained below expected levels (see Chart 2). The EU ETS is now widely regarded as a success and has resulted in a 3.8% reduction in total EU-wide emissions over the period between 2008 and 2016.

---

8. Ibid.
In the long-term we believe China’s ETS will end up looking more like the present-day EU ETS in that if a company does not reduce their carbon emissions, they may end up being heavily penalized. We believe big market leaders will be the biggest beneficiaries of the scheme at the outset, given that they have the resources and scale to comply, while smaller companies might have more difficulty meeting the carbon intensity benchmarks.

Historically, coal has played a key role in China’s energy mix and accounts for about 60% of electricity generation. In the past decade, the emissions intensity of China’s coal fleet has been declining as larger and more efficient coal-fired plants have replaced smaller older ones (see Chart 3). The Chinese government has also expanded the role of natural gas in different sectors. In 2021, major Chinese power generation companies announced plans to achieve peak carbon emissions by 2025 and to invest in renewables in a big way.

We believe that the ETS can help to phase out inefficient power generation sources using the approach of average carbon intensity as a metric. With its output-based allowance allocation design, the ETS will prompt more efficient coal-fired power generation. Units that achieve emissions intensities below the applicable benchmark can sell surplus allowances while those exceeding the benchmark would need to purchase them. We expect this can lead to an improvement in carbon intensity emissions among power plants in the short term. However, with the long-term aim to achieve carbon neutrality, China’s ETS needs to offer greater incentives for power plants to switch from coal to renewable energy sources.

Source: Refinitiv Eikon, Morgan Stanley Research
The steel, cement, and aluminum sectors are responsible for the highest carbon emissions in China, accounting for 18%, 16% and 5% of total emissions, respectively. Large production cuts have already been announced for steel and aluminum that could cut 1-5% of production by FY21E.11 The advent of the ETS could further tighten supply. One major impact of carbon trading across different materials, including steel, cement, and aluminum, will be steeper cost curves and supply cuts. Thus, more efficient producers will likely benefit. Given the higher carbon expenses for emissions exceeding the free quota, producers that emit more will likely move to the higher end of cost curves.12 Regarding supply cuts, we expect such producers (whose actual carbon emissions exceed the allocated free quota), to face frequent supply disruptions as they aim to control their overall emissions.

What could hinder the scheme’s development?
China’s ETS currently has a flexible emissions cap that can fluctuate depending on the output and intensity benchmark of the power plant in question. This gives plants the incentive to outperform their benchmark by running more efficiently. However, these allowances can be adjusted and can also include a bonus for sites that operate infrequently, which could counter this efficiency incentive.13

In the current design, power generation companies in aggregate are still expected to be allowed to emit more than 4 billion tons of greenhouse gases in 2021. However, many expect the government to gradually tighten the quota in the coming years, and auction an increasing proportion of it, shifting away from the current approach of giving it away for free.14

From perspective of regulators, the challenge will be to balance incentivizing companies to adhere to the ETS while also ensuring they do not face too much of a financial burden. One major criticism of the scheme at present is the limited penalty for non-compliance or forged information at just 30,000 yuan.15 Companies will need allocate resources to change their business model and operating style to meet the new requirements. Affected companies may then compare the cost of compliance relative to paying the penalty.

Another challenge is the potential reputational risk companies may face by purchasing carbon allowances on the exchange. Stakeholders may view this as a signal that the firm’s climate performance is below average, particularly given the more stringent ESG disclosure rules for publicly traded companies in recent months.16

What are the investment implications?
Despite some potential bumps along the road, we believe that the scheme is a step in the right direction. In our opinion it will be positive for international and domestic investors in the long-term as it provides a financial measure on national carbon emissions and rewards corporates for their efforts in carbon reduction. This is expected to enhance transparency as investors will be better able to quantify what the government and specific companies are doing to help China meet its sustainability targets. Large asset owners in developed markets such as the US and Europe are using carbon pricing to assess the true cost of carbon abatement. In the same way investors can use China’s carbon pricing data to further assess how companies’ capital expenditure is being spent toward climate change mitigation.
What are the implications of China’s carbon emissions trading scheme?

Invesco Investment Insights
September 2021

Investment risks
The value of investments and any income will fluctuate (this may partly be the result of exchange rate fluctuations) and investors may not get back the full amount invested. Past performance is not a guide to future returns.

When investing in less developed countries, you should be prepared to accept significantly large fluctuations in value.

Investment in certain securities listed in China can involve significant regulatory constraints that may affect liquidity and/or investment performance.

Important information
This document is for Professional Clients only in Dubai, Jersey, Guernsey, the Isle of Man, Ireland, Continental Europe (as defined in the important information at the end) and the UK; for Institutional Investors only in the United States, for Sophisticated or Professional Investors in Australia; in New Zealand for wholesale investors (as defined in the Financial Markets Conduct Act); for Professional Investors in Hong Kong; for Qualified Institutional Investors in Japan; in Taiwan for Qualified Institutions/Sophisticated Investors; in Singapore for Institutional/Accredited Investors; for Qualified Institutional Investors and/or certain specific institutional investors in Thailand; for certain specific sovereign wealth funds and/or Qualified Domestic Institutional Investors approved by local regulators only in the People’s Republic of China; for certain specific institutional investors in Malaysia upon request; for certain specific institutional investors in Brunei; for Qualified Professional Investors in Korea; in Canada, this document is restricted to Accredited Investors as defined under National Instrument 45-106. It is not intended for and should not be distributed to or relied upon by the public or retail investors. Please do not redistribute this document.

The publication is marketing material and is not intended as a recommendation to invest in any particular asset class, security or strategy. Regulatory requirements that require impartiality of investment/investment strategy recommendations are therefore not applicable nor are any prohibitions to trade before publication. The information provided is for illustrative purposes only, it should not be relied upon as recommendations to buy or sell securities.

By accepting this document, you consent to communicate with us in English, unless you inform us otherwise.

For the distribution of this document, Continental Europe is defined as Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Liechtenstein, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden and Switzerland.

All articles in this publication are written, unless otherwise stated, by Invesco professionals. The opinions expressed are those of the author or Invesco, are based upon current market conditions and are subject to change without notice. This publication does not form part of any prospectus. This publication contains general information only and does not take into account individual objectives, taxation position or financial needs. Nor does this constitute a recommendation of the suitability of any investment strategy for a particular investor.

Neither Invesco Ltd. nor any of its member companies guarantee the return of capital, distribution of income or the performance of any fund or strategy. Past performance is not a guide to future returns.

This publication is not an invitation to subscribe for shares in a fund nor is it to be construed as an offer to buy or sell any financial instruments. As with all investments, there are associated inherent risks. This publication is by way of information only. This document has been prepared only for those persons to whom Invesco has provided it. It should not be relied upon by anyone else and you may only reproduce, circulate and use this document (or any part of it) with the consent of Invesco. Asset management services are provided by Invesco in accordance with appropriate local legislation and regulations.

Certain products mentioned are available via other affiliated entities. Not all products are available in all jurisdictions.
What are the implications of China’s carbon emissions trading scheme?

Invesco Investment Insights
September 2021

This publication is issued:
– in Hong Kong by Invesco Hong Kong Limited (景順投資管理有限公司) , 41/F, Champion Tower, Three Garden Road, Central, Hong Kong. This document has not been reviewed by the Securities and Futures Commission.
– in Singapore by Invesco Asset Management Singapore Ltd, 9 Raffles Place, #18-01 Republic Plaza, Singapore 048619.
– in Taiwan by Invesco Taiwan Limited, 22F, No.1, Songzhi Road, Taipei 11047, Taiwan (0800-045-066).
  Invesco Taiwan Limited is operated and managed independently.
– in Japan by Invesco Asset Management (Japan) Limited, Roppongi Hills Mori Tower 14F, 6-10-1 Roppongi, Minato-ku, Tokyo 106-6114; Registration Number: The Director-General of Kanto Local Finance Bureau (Kin-sho) 306; Member of the Investment Trusts Association, Japan and the Japan Investment Advisers Association.
– in Australia by Invesco Australia Limited (ABN 48 001 693 232), Level 26, 333 Collins Street, Melbourne, Victoria, 3000, Australia which holds an Australian Financial Services Licence number 239916.

This document has been prepared only for those persons to whom Invesco has provided it. It should not be relied upon by anyone else. Information contained in this document may not have been prepared or tailored for an Australian audience and does not constitute an offer of a financial product in Australia. You may only reproduce, circulate and use this document (or any part of it) with the consent of Invesco.

The information in this document has been prepared without taking into account any investor’s investment objectives, financial situation or particular needs. Before acting on the information the investor should consider its appropriateness having regard to their investment objectives, financial situation and needs.

You should note that this information:
- may contain references to dollar amounts which are not Australian dollars;
- may contain financial information which is not prepared in accordance with Australian law or practices;
- may not address risks associated with investment in foreign currency denominated investments; and
- does not address Australian tax issues.

– in New Zealand by Invesco Australia Limited (ABN 48 001 693 232), Level 26, 333 Collins Street, Melbourne, Victoria, 3000, Australia which holds an Australian Financial Services Licence number 239916.

This document is issued only to wholesale investors (as defined in the Financial Markets Conduct Act) in New Zealand to whom disclosure is not required under Part 3 of the Financial Markets Conduct Act. This document has been prepared only for those persons to whom it has been provided by Invesco. It should not be relied upon by anyone else and must not be distributed to members of the public in New Zealand. Information contained in this document may not have been prepared or tailored for a New Zealand audience. You may only reproduce, circulate and use this document (or any part of it) with the consent of Invesco. This document does not constitute and should not be construed as an offer of, invitation or proposal to make an offer for, recommendation to apply for, an opinion or guidance on Interests to members of the public in New Zealand. Applications or any requests for information from persons who are members of the public in New Zealand will not be accepted.
– in the United States by Invesco Advisers, Inc., Two Peachtree Pointe, 1555 Peachtree Street N.E., Atlanta, Georgia 30309, USA.
– in Canada by Invesco Canada Ltd. 120 Bloor Street East, Suite 700, Toronto, Ontario M4W 1B7.
– in Austria and Germany by Invesco Asset Management Deutschland GmbH, An der Welle 5, 60322 Frankfurt am Main, Germany.
– in Belgium, Denmark, Finland, France, Greece, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain and Sweden by Invesco Management S.A., President Building, 37A Avenue JF Kennedy, L-1855 Luxembourg, regulated by the Commission de Surveillance du Secteur Financier, Luxembourg.
– in Dubai by Invesco Asset Management Limited, PO Box 506599, DIFC Precinct Building No 4, Level 3, Office 305, Dubai, United Arab Emirates. Regulated by the Dubai Financial Services Authority.
– in Ireland, the Isle of Man, Jersey, Guernsey and the UK by Invesco Asset Management Limited, Perpetual Park, Perpetual Park Drive, Henley-on-Thames, Oxfordshire, RG9 1HH, United Kingdom. Authorised and regulated by the Financial Conduct Authority.
– in Switzerland and Liechtenstein by Invesco Asset Management (Schweiz) AG, Talacker 34, 8001 Zurich, Switzerland.