International Carbon Action Partnership

China - Shanghai pilot ETS

General Information

ETS Description

The Shanghai Pilot ETS was launched in November 2013 and was the second Chinese region to start its pilot system.

The system covers nearly 380 entities, expanding from 2024 to include road transport and emissions from data centers operation. In 2016, Shanghai further expanded its ETS coverage by adding maritime shipping and more industrial sectors and lowering the participation threshold to 10,000 tCO_2 per year.

Covered entities must surrender allowances for all their covered emissions, and allocation is based on auctions or free allocation. Ad hoc auctions were held between 2014 and 2019, after which there have been two auctions held per year. In 2023, entities in road transport with emissions over 10,000 tCO_2 and data centers with over 20,000 tCO_2 per year were included in the ETS scope.

The Shanghai ETS is the only pilot that has achieved a 100% compliance rate since its launch. It is also one of the most active pilots in terms of offset credit trading. Shanghai has been a center for carbon finance innovations in China, including repurchases, carbon funds, carbon trusts, CCER pledge loans, green bonds, and carbon margin trading. Since July 2021, the Shanghai Environmental and Energy Exchange (SEEE) has operated a trading platform for the national ETS.

The Shanghai ETS operates in parallel with the China national ETS. As the national ETS expands to new sectors, covered entities in these sectors will be integrated into the national ETS.

ETS Status

in force

Jurisdictions

Shanghai

Year in Review

In February 2024, the 2023 allowance allocation plan was released. According to it, 23 data centers have been added with compliance obligation starting from compliance year 2023. Also 17 logistics companies in the road transport sector have been added, but with MRV obligations only.

In May, July and September, the Shanghai EEB auctioned 2,239,829 allowances for a total of CNY 171.619 million (USD 23.84 million).

Sectoral coverage

Maritime
Domestic Aviation
Transport
Buildings
Industry
Power

Revenue usage

General budget, including debt reduction

Emissions & Targets

Overall GHG Emissions excl. LULUCF (MtCO2e)

243.99 MtCO_2e (2020)*

* Due to the lack of publicly available data, the data reported here is estimated by local expert based on public sources.

GHG reduction targets

By 2025: Peak total and per capita CO_2 emissions (Shanghai Urban Master Plan 2017 to 2035 and 14th Five-Year Plan)

By 2035: Reduce CO_2 emissions by ~5% as compared to peak levels (Shanghai Urban Master Plan 2017 to 2035)

By 2060: Climate neutrality ("Shanghai Carbon Peaking Implementation Plan")

Current Allowance Price (per t/CO2e)

Average auction price: CNY 77.87 (USD 10.82) (updated prices available here)

Average secondary market price: CNY 75.45 (USD 10.48)

Size & Phases

Covered emissions (2020)

36.00%

GHGs covered

CO2 only

Phases

PHASE 1: 2013 to 2015, also known as the "trial phase"

PHASE 2: 2016 to present

Cap or total emissions limit

A cap limits the total emissions allowed in the system. Inclusive of reserves, the caps for past years were set as follows:

PHASE 1:

~150 MtCO_2 per year

PHASE 2:

2016: 155 MtCO_2

2017: 156 MtCO_2

2018: 158 MtCO_2

2019: 158 MtCO_2

2020*: 105 MtCO_2

2021: 109 MtCO_2

2022: 100 MtCO_2

2023: 105 $MtCO_2$

*This drop from 2019 is primarily due to the transfer of large parts of the power sector into the China national ETS.

Sectors and thresholds

PHASE 1: Airports, domestic aviation, chemical fibers, chemicals, commercial, power and heat, water suppliers, hotels, financial, iron and steel, petrochemicals, ports, non-ferrous metals, building materials, paper, railways, rubber, and textiles.

Inclusion thresholds:

- Power and industry: Emissions of at least 20,000 tCO_2 per year
- Other sectors: Emissions of at least 10,000 tCO_2 per year

PHASE 2: Previous sectors plus shipping, electronic materials, pharmaceuticals, automotive manufacturing, and food manufacturing. Power plants were transferred to the China national ETS from 2019, but some special captive power plants and heat generation entities remain covered by the Shanghai carbon market. Data centers and road transport have been covered since 2022, with the latter only having MRV obligations.

Inclusion thresholds:

- Industry: either emissions of at least 20,000 tCO_2 per year or energy consumption of 10,000 tonnes of coal equivalent (tce) per year.
- Aviation: either emissions of at least 20,000 tCO_2 per year or energy consumption of 10,000 tce per year.
- Maritime: either emissions of at least 100,000 tCO_2 per year or energy consumption of 50,000 tce per year.
- Road transport: either emissions of at least 10,000 tCO_2 per year or energy consumption of 5,000 tce per year.
- Data center: emissions of at least 20,000 tCO_2 per year.
- Buildings (including port and airport): either emissions of at least 10,000t CO_2 per year or energy consumption of 5,000 tce per year.

Point of regulation

Point source (e.g., industry, road transport, aviation); downstream (indirect emissions from electricity and heat consumption).

Type of entities

Companies

Number of entities

378 entities (2023)

Allowance Allocation & Revenue

Allowance allocation

In Phase 1, covered entities received allowances for the whole period at once. In Phase 2, allowances are allocated on an annual basis. In addition, allocation methods have been progressively improved, including increased use of benchmarks.

FREE ALLOCATION:

Benchmarking: Free allocation based on sector-specific benchmarks is used for electricity and heat producers, the electricity grid, and data centers.

Grandparenting: Grandparenting based on historical emissions intensity is used for some industrial sectors, aviation, ports, shipping, and water suppliers, generally based on the previous three years' data.

Grandparenting based on historical emissions is used for airports, buildings, the commercial, and some industrial sectors with complex products or a considerable change in emissions boundaries, generally based on the previous three years' data.

Ex-post allocation adjustments, e.g., based on production data, are applied for those with historical intensity or benchmarking allocations.

Covered entities that demonstrate strong efforts in reducing both air pollution and carbon emissions and are not subject to environmental penalties or violations during 2023 and 2024, will receive an additional 0.3 to 0.5% allowances.

Covered entities that achieve a reduction in carbon emissions intensity or total carbon emissions in 2023 compared to 2022 and are graded A for air pollution control, will receive an additional 0.5% of their 2023 allocation (maximum 2,000 allowances per company). Those that achieve emission reductions and are graded B for air pollution control, will receive an additional 0.3% of their 2023 allocation.

AUCTIONING: A small share of the annual cap may be auctioned. The main purpose of auctions is to provide entities with additional supply to meet their compliance demand. One auction was held in each of the following years: 2014, 2016, 2018, and 2019. Since then, two auctions have been held each year, until 2023.

In 2024, three auctions were held in May, July and October. In the May sale, the floor price was set at the weighted average price of all trading days between November 2023 and April 2024, CNY 72.15 (USD 10.02). The auction offered 1 million allowances, all of which were sold at CNY 75.06 (USD 10.43) apiece, 4% above the price floor.

In July, the floor price was set at the weighted average price of all trading days between January and June 2024. The auction offered 1 million allowances, all which were sold at CNY 75.07 (USD 10.43) apiece.

In October, 2.8 million allowances were offered in the auction, with the floor price of CNY 89.60 (USD 12.45). Only 8.57% of the allowances were sold, at the floor price.

Total Revenue

CNY 628.01 million (USD 87.25 million) since the beginning of the program

CNY 171.62 million (USD 23.84 million) in 2024
2024

Use of Revenues

Revenues are attributed to the provincial treasury.

Flexibility & Linking

Offset credits

The use of offset credits – CCERs and provincial offset SHCERs – is allowed.

QUANTITATIVE LIMITS:

Phase 1: The use of CCER credits was limited to 5% of verified emissions.

Phase 2: From 2016 to 2018, the use of CCERs was limited to 1% of the annual allocation. For the compliance years 2019 and 2020, the use of CCERs was limited to 3% of verified emissions. In 2019, only 2% was allowed for offset credits generated outside the Yangtze River Delta region*, and 1% must have stemmed from within the region.

This limitation was raised to 5% in 2022 for both CCERs and SHCERs.

QUALITATIVE LIMITS:

Phase 1: Offset credits for reductions before January 2013 could not be used for compliance.

Phase 2: Same restriction as in Phase 1. Additionally, credits from hydro projects are not allowed.

Since 2023, eligible green power purchased through the green power trading platform of Beijing Electricity Trading Center in the form of inter-provincial transactions, is considered zero emissions.

In 2023, 10,299 tCO_2e of offset credits were surrendered, of which 88.5% were SHCERs.

* The region covers Shanghai, Jiangsu, Zhejiang, and Anhui.

Banking and borrowing

Banking is allowed, with some restrictions for banking across trading periods. For banked allowances from the first trading period, only one-third per year could be used by compliance entities between 2016 and 2018. Allowances are bankable for institutional investors without such an annual maximum limit.

Borrowing is not allowed.

Links with other Systems

Although the SEEE operates the trading systems for both the national ETS and the Shanghai regional pilot, the two markets are separate. The Shanghai ETS is not linked with any other system.

Other carbon pricing instruments in the jurisdiction

ETS: National Chinese ETS

Domestic offsetting mechanisms: Shanghai Carbon Emission Reduction (SHCER)

Domestic crediting mechanisms (national): China Certified Emissions Reduction (CCER)

Compliance

Compliance mechanism

Covered entities must surrender one allowance per tCO_2e emitted for all their covered emissions.

Compliance Period

One calendar year. Covered entities must surrender allowances by June of the following year.

Monitoring, Reporting, Verification (MRV)

MONITORING: Covered entities are required to set up monitor plans and monitor their emission based on these plans.

REPORTING: Annual, to the Shanghai EEB before the end of March.

VERIFICATION: Third-party verification is required. The Shanghai EEB commissions an independent third party to carry out verification. In addition, "fourth-party verification" is carried out by government-assigned experts. The government also assesses verifiers' performance through a performance evaluation mechanism.

FRAMEWORK: The Shanghai government has released general rules for monitoring and reporting, as well as sector-specific guidelines for the following sectors: iron and steel, power and heat, chemicals, nonferrous metals, non-metallic mineral products, textiles and paper, aviation, shipping, large buildings (hotels, commercial, and financial), and transport (e.g., ports).

Third-party verification rules have been strengthened in recent years. In December 2020, the Shanghai EEB amended the interim measures for managing third-party verifiers. In October 2021, it released a new policy on the supervision and assessment of verifiers.

Penalties and enforcement

COVERED ENTITIES: Penalties for failing to submit an emission or verification report on time or for providing fraudulent information range from CNY 10,000 (USD 1,389) to CNY 50,000 (USD 6,947).

Between CNY 50,000 (USD 6,947) and CNY 100,000 (USD 13,894) can be imposed for non-compliance, in addition to the obligation to surrender the missing number of allowances. Further sanctions may also be imposed, such as entry into the credit record of the company, being added to a publicly available online list, loss of access to funds for energy conservation and emissions reduction measures.

THIRD-PARTY VERIFIERS: Third-party verifiers are penalized with a fine of between CNY 10,000 (USD 1,389) to CNY 50,000 (USD 6,947) for issuing false verification reports, material errors in verification reports, and for unauthorized use or publication of confidential corporate or emissions information.

Market Regulation

Market Stability Provisions

RESERVE

Instrument type: N/A

Functioning: A small share of the annual cap can be kept in a reserve for auctioning before the end of the annual compliance cycle as a market stability measure (see 'Allowance Allocation' section). The Shanghai EEB can organize irregular auctions according to market demand, no fixed triggers are envisaged.

EXCHANGE

Instrument type: Price-based instrument

Functioning: The Shanghai Environment and Energy Exchange implements a system of limits on price increases and decreases for trading over the exchange. For listed trading (trading volume less than 100,000 tCO_2), this is 10% above or below the reference price (the weighted average price of all transactions on the previous trading day). For block trading (with minimum trading volume of 100,000 tCO_2), this is 30% above or below the reference price. Only transactions within this price range can be successfully completed on the exchange.

Market Design

MARKET PARTICIPATION: Compliance entities; non-compliance entities (domestic institutional investors that meet the requirement of the carbon emission trading rules set up by the SEEE).

MARKET TYPES:

Primary: No set percentage of allowances are allocated via auctioning, though the Shanghai ETS regulations state that auctioning is to be introduced gradually. Ad hoc auctions have been held since 2014 to provide compliance entities with additional supply. In addition, further auctions have also been held since 2020 where institutional investors have also been allowed to participate.

Secondary: Products include Shanghai Emission Allowances (SHEA), Shanghai Emission Allowance Forwards, and CCERs. SHEAs and CCERs are spot products. Shanghai Emission Allowance Forward (SHEAF) is the standardized spot forward product.

LEGAL STATUS OF ALLOWANCES: Allowances are not considered financial instruments.

Other Information

Institutions involved

Shanghai Ecology and Environment Bureau (EEB): Acts as the competent authority setting the rules and overseeing the system.

Shanghai Environment and Energy Exchange: Responsible for operating the trading platform.

Shanghai Information Center: Responsible for overseeing and operating the registry.

Regulatory Framework

Shanghai Pilot ETS Implementation Plan

Measures for Management of Emissions Trading in Shanghai

Shanghai EEB- Allocation Plan for 2019 (including list of covered entities)

Shanghai EEB- Allocation Plan for 2020 (including list of covered entities)

Shanghai EEB- Allocation Plan for 2021 (including list of covered entities)

Shanghai EEB- Allocation Plan for 2022 (including list of covered entities)

Shanghai EEB- Allocation Plan for 2023 (including list of covered entities)

Evaluation / ETS review

No information is publicly available about the evaluation or review system. However, the local carbon exchange has published annual reports on the Shanghai ETS with an overview of its performance from 2013 to 2020. Research on improving the ETS is undertaken every year, funded by the local government.

Disclaimer

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