Korea Emissions Trading System (K-ETS)

General Information

ETS Description

The Korea Emissions Trading System (K-ETS) launched in 2015 as East Asia's first nationwide, mandatory ETS. It covered 79% of Korea's GHG emissions in 2022. The K-ETS aims to help the country in its objective to become carbon neutral by 2050, a target embedded in the 2021 "Carbon Neutral Framework Act".

The K-ETS covers 816 of the country's largest emitters in the power, industrial, buildings, waste, transport, domestic aviation and maritime sectors. Covered entities must surrender allowances for all their covered emissions, and allocation is done via auctions or free distribution. At least 10% of allowances in eligible sectors must be auctioned. Free allocation is provided for EITE sectors based on production cost and trade intensity benchmarks. Since 2021, domestic financial intermediaries and other third parties have been able to participate in the exchange.

The K-ETS was established by the "Framework Act on Low Carbon, Green Growth" (2010). It was preceded by a mandatory Target Management System (TMS), launched in 2012, following a two-year pilot phase. The TMS facilitated the collection of verified emissions data and training in the MRV process and still applies to smaller entities not covered by the K-ETS.

ETS Status

in force

Jurisdictions

Korea, Republic of

Year in Review

In 2024, new rules to increase liquidity in the K-ETS, focusing on facilitating market participation and banking, entered into force:

1. Restrictions on the carryover of unused allowances were relaxed to five times the net sales (total allowances sold minus total allowances bought) and the conversion period of offset credits prolonged from two to five years.
2. The government encourages the launch of carbon price-linked financial products and will introduce futures markets by 2025.
3. Consignment trading was introduced to the market. The K-ETS opened up to additional financial institutions..
4. Auction volume is adjusted annually if necessary. Since 2024, the monthly auctioned volume depends on the previous month's auction results:

a) if the bid ratio is less than 100%, the next month's auction volume will be determined by the current month's winning quantity; or,

b) if the bid ratio is 100% or more, the next month's auction volume will be determined by the current month's auctioned volume or higher, whichever the government decides

In September 2024, the Ministry of Environment announced additional measures to increase liquidity in the market, which entered into effect in February 2025:

1. Opening up the ETS to a wider group of financial institutions
2. Laying the foundations for individuals to participate in the market

3. Revisions of some criteria for market stabilization measures
4. Tightening of the regulations for cancelling emission allowances by raising the threshold for allowance cancellation from 50% to 15% of the allocation

In December 2024, the government adopted its fourth “Basic Plan for the Emissions Trading System” covering the ten-year period between 2026 and 2035. It addresses the fourth and fifth allocation period (2026 to 2030 and 2031 to 2035). The Basic Plan aims to better align the ETS with the country’s Carbon Neutral Framework Act and updated NDC. The Basic Plan includes the following measures:

1. Auctioning will significantly be increased in the electricity and other high-emitting sectors and incentives for decarbonization enhanced.
2. Allocation based on benchmarking will be increased to 75% of covered entities (up from 60%). (The fourth allowance allocation plan will be published in 2025.)
3. A Market Stabilization Mechanism will be introduced to automatically adjust supply of and demand for allowances.
4. Banking rules will be relaxed.
5. Expansion of auction participation to non-compliance actors such as market makers and third parties
6. Revenues will be used for companies’ emission reduction activities.
7. Companies will be grouped in electricity and non-electricity sectors instead of the current six groups.

Carbon Contracts for Difference will be introduced to incentivize innovation.

Sectoral coverage

Maritime
Waste
Domestic Aviation
Transport
Buildings
Industry
Power

Revenue usage

Climate mitigation
Low-carbon innovation
Assistance for individuals, households, and businesses

Emissions & Targets

Overall GHG Emissions excl. LULUCF (MtCO2e)

724.3 $MtCO_2e$ (2022)

GHG reduction targets

By 2030: At least a 35% reduction below 2018 emissions (Carbon Neutral Framework Act); 40% reduction below 2018 levels (updated NDC)

By 2050: Carbon neutrality (Carbon Neutral Framework Act)

Current Allowance Price (per t/CO2e)

Updated prices available here

Size & Phases

Covered emissions (2022)

79.00%

Verified ETS Emissions

572.00MtCO_2e

GHGs covered

CO2, CH4, N2O, HFCs, PFCs, SF6

Phases

PHASE 1: Three years (2015 to 2017)

PHASE 2: Three years (2018 to 2020)

PHASE 3: Five years (2021 to 2025)

Cap or total emissions limit

A cap limits the total emissions allowed in the system.

PHASE 1: The cap was 1,689.2 MtCO_2e, including a reserve of 89.4 MtCO_2e for early action and new entrants. 84.5% of the reserve was used within the phase. 14.3 million allowances were set aside in a reserve for market stabilization (see 'Market Stability Provisions' section), bringing the total number of allowances in Phase 1 to 1,704.2 million.

Annual Caps in Phase 1:

2015: 540.1 MtCO_2e

2016: 560.7 MtCO_2e

2017: 585.5 MtCO_2e

PHASE 2: The cap was 1,777 MtCO_2e, including 134 million for new entrants and other purposes. 14 million allowances were set aside for market stabilization and 5 million for the market makers (see 'Market Design' section) bringing the total amount of allowances to 1,796.1 million in Phase 2.

Annual Caps in Phase 2:

2018: 593.5 MtCO_2e

2019: 563.2 MtCO_2e

2020: 562.5 MtCO_2e

The higher caps in Phase 2 reflected the expansion of the sectoral scope of the K-ETS (see 'Sectors and Thresholds' section).

PHASE 3: The cap is 3,048.3 MtCO_2e. This corresponds to an average annual cap of 610 MtCO_2e, including reserves. Annual caps appear higher in Phase 3 due to the expansion in scope but reflect a 4.7% decrease in emissions compared to the 2017 to 2019 baseline. In addition, 14 million allowances are set aside for market stability purposes and 20 million for market makers, bringing the total amount of allowances in Phase 3 to 3,082.3 million.

Annual Caps in Phase 3 (excluding reserves):

2021: 589.3 MtCO_2e

2022: 589.3 MtCO_2e

2023: 589.3 MtCO_2e

2024: 567.1 MtCO_2e

2025: 567.1 MtCO_2e

Sectors and thresholds

PHASE 1: 23 sub-sectors from the following five sectors: heat and power, industry, buildings, waste, and transportation (domestic aviation).

PHASE 2: According to the Phase 2 Allocation Plan, the public and waste sectors were disaggregated such that the K-ETS covered the following six sectors: heat and power, industry, buildings, transportation, waste, and the public sector. These were divided into 62 sub-sectors.

PHASE 3: Coverage within the transport sector was widened to include freight, rail, passenger, and maritime shipping. Construction industries have also been brought into the system's scope. This increased the number of sub-sectors to 69.

INCLUSION THRESHOLDS: Companies emitting more than 125,000 tCO_2 per year, and facilities with emissions in excess of 25,000 tCO_2 per year.

The scheme covers both direct emissions and indirect emissions from electricity consumption. The same inclusion thresholds apply.

Point of regulation

Point source (power, industry, buildings, transport, domestic aviation, waste, public/other); downstream (buildings)

Type of entities

Installations/facilities, companies, financial institutions (market makers, see 'Market Design' below), third-party institutions, e.g. financial firms and brokers

Number of entities

816 entities (2024)

Allowance Allocation & Revenue

Allowance allocation

PHASE 1:

Free Allocation: 100% of total allowance supply. Most sectors received free allowances based on the average GHG emissions of the base years (2011 to 2013). Three sub-sectors (grey clinker, oil refining, and aviation) were allocated free allowances following benchmarks based on previous activity data from the base years.

PHASE 2:

Free Allocation: 97% of allocation to entities in sub-sectors subject to auctioning; 100% for EITE sectors. Toward the end of Phase 2, the share of sector-specific benchmarking reached 50% of total primary allocation and was expanded to a total of seven sub-sectors: grey clinker, oil refining, domestic aviation, with the addition of waste, industrial parks, electricity generation, and district heating/cooling.

EITE sectors received 100% of their allowances for free if they met one of the following three criteria:*

- Additional production cost of >5% and trade intensity of >10%; or
- Additional production cost of >30%; or
- Trade Intensity of >30%.**

Auctioning: Regular auctions began in 2019. Participation in auctions is subject to some limitations. Only companies that do not receive all their allowances for free are eligible to bid, with a list of eligible bidders published by the Ministry of Environment. Bidders can purchase 15-30% of the allowances on offer. The auctions are subject to a minimum price.

- Auction share: 3% of allocation to entities in 26 eligible sub-sectors, including entities from the electricity, domestic aviation, wooden products, and metal foundry sectors.
- Auction volume: 7.95 million allowances (2019) and 9.3 million (2020).

PHASE 3:

Free Allocation: Less than 90% of free allocation to entities in sub-sectors that are subject to auctioning; 100% for EITE sectors. The share of sector-specific benchmarking is to reach 60% and has been expanded to a total of 12 sub-sectors: grey clinker, oil refining, domestic aviation, waste, industrial parks, electricity generation, and district heating/cooling, with the addition of steel, petrochemicals, buildings, paper, and wood processing. EITE sectors receive 100% free allocation if they meet the following criteria:

Production cost x Trade Intensity ≥ 0.2%

Allocation is calculated using the following formulas:

- Benchmark allocation: *Benchmark value (tCO_2e/t) x historical activity level (t) x correction factor x carbon leakage factor*
- Grandparenting allocation: *Average GHG emissions of base year x correction factor x carbon leakage factor*

The carbon leakage factor is 1.0 for sectors exposed to significant risk; for non-EITE sectors, it is 0.9.

A tightening of benchmarks to align the K-ETS with long-term climate targets is under discussion.

Auctioning: Bidders can purchase a maximum of 15% of the allowances on offer. The government is expected to increase the share of auctioned allowances in the coming years.

Auction share: At least 10% of allocation to entities in sub-sectors subject to auctioning. Entities from 41 sub-sectors, excluding EITE sectors, can participate in auctions.

Auction supply: 23.51 million allowances (KAU2021), 18.24 million allowances (KAU2022), and 16.16 million allowances (KAU2023) which represents ~3% of the 589.3MtCO_2e 2023 cap (excluding reserves).

* Additional Production Cost: *(annual average GHG emissions during base year x average market price of allowances during base year)/annual average value-added production during base year*

** Trade Intensity is calculated relative to the base year: *(annual average exports + annual average imports)/(annual average sales + annual average imports)*

Auctioning share

3%

Total Revenue

KRW 1.4 trillion (USD 1 billion) since the beginning of the program

KRW 185.9 billion (USD 136.4 million) in 2024
2024

Use of Revenues

Revenues from auctioning go into the Climate Response Fund, which supports emissions mitigation infrastructure, low-carbon innovation, and technology development for small- and mid-sized companies covered by the K-ETS.

Flexibility & Linking

Offset credits

Domestic offset credits, i.e. Korean Offset Credits (KOCs), were allowed in Phase 1. KOCs and international credits (subject to qualitative criteria) have been allowed since Phase 2. Both domestic and international credits must be converted to KCUs to be used for compliance.

PHASE 1:

Qualitative limit: The use only of domestic offset credits from external reduction activities implemented by non-ETS entities — and that met international standards — was allowed. Domestic CDM credits (CERs) and KOCs were allowed. Eligible activities included those eligible under the CDM plus carbon capture and storage, and had to have been implemented after mid-April 2010.

Quantitative limit: Up to 10% of each entity's compliance obligation.

PHASE 2:

Qualitative Limit: The use of CERs generated from June 2016 from international CDM projects developed by Korean companies was allowed if:

- at least 20% of the ownership rights, operating rights, or the voting stocks were owned by a Korean company; or
- a Korean company supplied low-carbon technology worth at least 20% of the total project cost.

Quantitative limit: Up to 10% of each entity's compliance obligation (of which up to 5% can be international offset credits).

PHASE 3:

Qualitative limit: The use of offset credits is allowed according to the same qualitative criteria outlined for Phase 2. However, limitations apply to the issuance and conversion of credits:

- GHG reduction projects (according to reduction period coverage) to KOC conversion: 1) April 2010 to December 2020: within two years (2021 to 2022); 2) January 2021 onwards: within two years (2022 to 2023).
- KOC to KCU conversion: within five years of KOC issuance.

Quantitative limit: Up to 5% of each entity's compliance obligation, regardless of type.

As of December 2023, there were 292 registered methodologies (211 for CDM and 81 for domestic offset credits). The government aims to use 37.5 million international credits to fulfill its 2030 NDC.

For the 2022 compliance period, 7.6 million KOCs, 6.96 million of which were from domestic projects and the remaining 0.65 million from overseas projects, were converted into KCU22s, all of which were used for surrender of emission permits (65 entities).

Banking and borrowing

Banking is allowed with restrictions across and within phases.

Borrowing is allowed within a single trading phase.

PHASE 1: Borrowing was limited to 20% of an entity's obligation.

PHASE 2: From Phase 2 to Phase 3, banking was initially limited to the higher of two limits: the net annual number of allowances sold by the entity in Phase 2; or company- and facility-specific limits of 250,000 Korean Allowance Units (KAUs) and 5,000 KAUs, respectively. Borrowing was limited to 15% of an entity's obligation in 2018.

Rules on banking and borrowing were adjusted in 2019. The borrowing limit was set by each entity's past borrowing activity, according to the following formula: *Compliance obligation of the entity x [Borrowing limit of previous year – ("borrowing ratio" in previous year x 50%)]/entity's emission volume*.

The banking limit for the transition between Phase 2 and Phase 3 has been calculated as follows:

- For allowances from the 2018 vintage (KAU18), entities can bank either three times the net sales (total allowances sold minus total allowances bought) or 75,000 allowances for companies emitting >125,000 tCO_2e or 15,000 allowances for companies emitting >25,000 tCO_2e — whichever is higher;
- For KAU19s, the amounts above are reduced by one-third, i.e., two times the net selling amount or 50,000 for large entities (10,000 for smaller entities) allowances, whichever is higher;
- For KAU20s, the amount represents a two-third reduction compared to the KAU18 rule.

PHASE 3: In the first trading year, entities could borrow up to 15% of their compliance obligation. From the second to fourth trading years, the same borrowing formula as for 2019 applies.

Banking in Phase 3:

- In the first and second compliance years (2021 and 2022), entities could bank up to double their net number of KAUs and Korean Credit Units (KCUs) sold on the secondary market (excluding swaps and auctions).
- In the third and fourth compliance years (2023 and 2024), entities' banking limits are equal to their net number of allowances (total allowances sold minus total allowances bought) and offset credits sold.

Phase 3 allowances and offset credits can only be carried over to the first compliance year of Phase 4 (2026 to 2030). The banking limit in the fifth compliance year (2025) also follows the "three times of net sales" rule.

Links with other Systems

The K-ETS is not linked with any other system.

Compliance

Compliance mechanism

Covered entities must surrender one compliance unit (allowance or offset credit) per tCO_2e emitted.

Compliance Period

One year. Entities must surrender allowances for the previous year by the end of August.

Monitoring, Reporting, Verification (MRV)

REPORTING: Annual reporting of emissions from the previous year must be submitted by the end of March.

VERIFICATION: Emissions must be verified by a third-party verifier.

FRAMEWORK: Emission reports are reviewed and certified by the Certification Committee of the Ministry of Environment by the end of May.

Liable entities are required to revise and resubmit emission reports which are found to be incorrect.

Penalties and enforcement

The penalty shall not exceed either three times the average market price of allowances of the given compliance year or KRW 100,000 (USD 73.39) per tonne.

Market Regulation

Market Stability Provisions

KOREAN MARKET STABILITY RESERVE (K-MSR)

Instrument type: Price-based instrument

Functioning: An Allocation Committee is in place to implement market stabilization measures if:

- the market allowance price of six consecutive months is at least three times higher than the average price of the two previous years;
- the market allowance price of the last month is at least double the average price of the two previous years and the average trading volume of the last month is at least twice the volume of the same month of the two previous years;
- the average market allowance price of a given month is lower than 60% of the average price of the two previous years; or
- it is difficult to trade allowances due to an imbalance of supply or demand.

Stabilization measures include:

- additional auctioning of up to 25% of allowances from the market stabilization reserve, which contains 14.3 million allowances;
- the establishment of a limit to the number of allowances entities can hold: minimum (70%) or maximum (150%) of the allowances of the compliance year;
- an increase or decrease of the borrowing limit;
- an increase or decrease of the offset limit; and
- the temporary establishment of a price ceiling or price floor.

In 2018, the Allocation Committee put up for auction an additional 5.5 million allowances from the stability reserve to ease the market in the lead-up to the 2017 compliance deadline; 4.7 million of these were sold. No more such sales have occurred since.

In 2021, the Allocation Committee set a price floor of KRW 12,900 (USD 9.47) per tonne in April and KRW 9,450 (USD 6.93) per tonne in June.

In 2023, the government set two temporary price floors. The measure’s trigger price remained at an average of KRW 12,088 (USD 8.87), calculated as 60% of the average price from the preceding two years. The first price floor of KRW 7,020 (USD 5.15) was established in July and the last price floor of KRW 7,750 (USD 5.69) was set in November and lifted in early December (when prices were maintained at KRW 8,520 (UDS 6.25) for five consecutive days).

Market Design

MARKET PARTICIPATION: Compliance entities. Limited participation for non-compliance entities. Initially limited to compliance entities, the "market maker" system was introduced in Phase 2 to improve market liquidity. Market makers are third-party participants in the K-ETS who can draw on a separate government-held reserve of allowances set aside at the time of original allocation, to increase liquidity in the market through daily allowance trade. Three new financial firms were appointed in 2021, in addition to the two market makers that had been appointed in 2019. In December 2022, the government announced a further two market makers who began operating from 2023. Eight market makers were appointed later in 2023.

From Phase 3, as per the 2012 "Emissions Trading Act" and the Presidential Decree, non-compliance entities in the form of other non-market maker domestic financial intermediaries can participate in the secondary market and trade allowances on the Korea Exchange (KRX). In line with this, 20 financial intermediaries were approved for participation in the carbon market from 2021 (the total as of December 2023 is 21 financial intermediaries). Though they initially could only hold up to 200,000 allowances each, to avoid excessive market share, this number was increased to 500,000 in December 2022, and again to one million in 2023.

MARKET TYPES:

Primary: Monthly auctions have been held since 2019. Sectors that receive 100% free allocation are not allowed to participate in auctions. Auctions take place via the KRX.

Secondary: The K-ETS has traditionally had a high share of over-the-counter transactions. Additionally, the KRX manages the platform where the spot secondary market transactions take place. Allowances, KCUs and KOCs are traded on the exchange for different vintage years. Consignment trading is set to be introduced in 2024.

LEGAL STATUS OF ALLOWANCES: The legal status of KAUs is not explicitly referenced in the 2012 Emissions Trading Act or the Presidential Decree. However, KAUs are not regulated under financial market law. For the purpose of preventing market price manipulation, unfair trade and to regulate exchange of information, Article 22, paragraph 3 of the Act specifies that certain provisions of "Capital Market and Financial Investment Business Act" apply.

Other Information

Institutions involved

Ministry of Environment: Holds overall responsibility for the K-ETS.

Ministry of Economy and Finance: Established the Allocation Committee; briefly held overall responsibility for the K-ETS between June 2016 and January 2018.

Korea Exchange (KRX): Trading and auctioning platform.

Greenhouse Gas Inventory and Research Center (GIR): Responsible for the registry and technical implementation.

International Carbon Reduction Council: Ministry-level body that promotes GHG reduction projects.

Regulatory Framework

Carbon Neutral Framework Act

Act on the Allocation and Trading of Greenhouse Gas Emissions Allowances

Enforcement Decree of the Act on the Allocation and Trading of Greenhouse Gas Emissions Allowances

First Basic Plan for the ETS (2015-2024)

Second Basic Plan for the ETS (2017-2026)

Third Basic Plan of the ETS (2021-2030)

Fourth Basic Plan for the ETS (2026-2035)

First Allocation Plan

Second Allocation Plan

Third Allocation Plan

Evaluation / ETS review

The GIR regularly releases summary (evaluation) reports that include key emissions statistics, market performance indicators, and survey results from covered entities.

Disclaimer

In line with ICAP's mandate, the ICAP ETS map exclusively covers cap-and-trade systems for greenhouse gas emissions. Information displayed on the map is regularly updated by ICAP Secretariat staff based on official and public information as far as possible and subject to annual peer review by government representatives from the covered systems. Although the information contained in the map is assembled with utmost care, ICAP cannot be held liable for the timeliness, correctness and completeness of the information provided. Please refer to the imprint on the website of the International Carbon Action Partnership regarding links to external websites, liability and privacy policy.