

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 77.75% of Korea's GHG emissions in 2023. 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 813 of the country's largest emitters in the power, industrial, buildings, waste, transport, domestic aviation, and maritime sectors (2025 compliance year). Covered entities must surrender allowances for all their covered emissions, and allocation is done via free distribution or auctions. By 2030, 50% of allowances in the power generation sector must be auctioned, with a gradual phase-in (2026: 15%, 2027: 20%, 2028: 30%, 2029: 40%, 2030: 50%). For the other sectors, 15% of allowances must be auctioned by 2030. Free allocation is provided for emissions-intensive, trade-exposed (EITE) sectors based on carbon intensity 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 November 2025, Korea approved the National Emission Allowance Allocation Plan for the fourth phase of the K-ETS, covering 2026 to 2030. It sets the total GHG emissions cap, introduces a quantity-based Market Stability Reserve (K-MSR), and increases the share of auctioned allowances.

The total cap for the period is set at 2.5 billion tCO₂e. A new linear reduction factor will apply, differentiating between the power generation and the non-power generation sectors, marking a shift from the previous proportional roadmap method. Sectoral reduction targets are also included in the allocation plan. The electricity, transport, buildings and waste sectors are all set to reduce emissions by more than 50% by 2035 relative to 2018 levels, with the electricity sector targeting a 69% to 75% cut. The other sectors have a lower reduction target.

Allocation rules are streamlined into two broad categories: power generation and non-power generation sectors. The auctioning share for the power generation sector will be gradually increased to 50% by 2030. Sectors at risk of carbon leakage, such as steel, non-ferrous metals, petrochemicals, cement, and semiconductors, will continue to receive 100% free allocation. These sectors account for around 95% of industrial emissions. Other non-power sectors will face a 15% auction rate. Benchmark-based allocation will be expanded to include semiconductors, displays and non-ferrous metals, and to cover fuel use across all industries. The benchmarking coefficient will gradually be tightened, moving from the weighted average of the top 37% of performers to the top 20%.

In aggregate, approximately 2.1 billion allowances will be allocated for free and 260 million auctioned during the fourth phase. A further 85 million allowances will be placed in the K-MSR, and around 89 million in the new entrants' reserve. Excluding the K-MSR and new entrants' reserve, roughly 11% of total allowances will be auctioned. Additional revenues from increased auctioning are earmarked to support business decarbonization.

The quantity-based K-MSR forms part of the overall cap and will be further defined in the first half of 2026 following public consultation.

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 (MtCO_{2e})

707.2 MtCO_{2e} (2023)

GHG reduction targets

By 2030: 40% reduction below 2018 levels (NDC 2.0)

By 2035: 53%-61% reduction compared to 2018 levels (NDC 2035)

By 2050: Carbon neutrality (Carbon Neutral Framework Act)

Current Allowance Price (per t/CO_{2e})

Updated prices available [here](#)

Size & Phases

Covered emissions (2023)

77.80%

Verified ETS Emissions

549.90MtCO_{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)

PHASE 4: Five years (2026 to 2030)

Cap or total emissions limit

An absolute cap limits the total emissions allowed in the system and is fixed ex-ante.

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 was 3,010.3 MtCO_{2e}. This corresponds to an average annual cap of 602 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 were set aside for market stability purposes and 20 million for market makers, bringing the total amount of allowances in Phase 3 to 3,044.3 million.

Annual Caps in Phase 3 (excluding reserves):

2021: 584.5 MtCO_{2e}

2022: 584.5 MtCO_{2e}

2023: 584.5 MtCO_{2e}

2024: 562.5 MtCO_{2e}

2025: 562.5 MtCO_{2e}

PHASE 4: The cap is 2,537.3 MtCO_{2e} (including reserves).

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.

PHASE 4: The fourth allocation plan only differentiates the power generation sector and the non-power sector instead of the previous six sectors. The number of sub-sectors was increased from 69 to 73.

INCLUSION THRESHOLDS: Companies with total annual covered emissions of 125,000 tCO_{2e} and if a company has at least one facility with over 25,000 tCO_{2e}.

Covered emissions include direct but also indirect emissions from externally supplied electricity and heat. 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

813 entities (2025)

Allowance Allocation & Revenue

Allowance allocation

Volume of 2024 cap offered for auction: 18.75 million vintage 2024 Korean Allowance Units (KAUs) between July 2024 and June 2025

Proportion of 2025 cap offered for auction: 3.33%

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 was subject to some limitations. Only companies that did not receive all their allowances for free were eligible to bid, with a list of eligible bidders published by the Ministry of Environment. Bidders could purchase 15-30% of the allowances on offer. The auctions were 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 were subject to auctioning; 100% for EITE sectors. The share of sector-specific benchmarking was to reach 60% and 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 received 100% free allocation if they met the following criteria:

Production cost x Trade intensity \geq 0.2%

Allocation was calculated using the following formulas:

- Benchmark allocation: Benchmark value (tCO₂e/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 was 1.0 for sectors exposed to significant risk; for non-EITE sectors, it was 0.9.

Auctioning: Bidders could purchase a maximum of 15% of the allowances on offer.

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

Auction supply: 23.5 million allowances (KAU2021), 18.2 million allowances (KAU2022), and 16.2 million allowances (KAU2023) which

represented ~3% of the 589.3 MtCO₂e 2023 cap (excluding reserves).

PHASE 4:

Free Allocation: Sectors at risk of carbon leakage receive 100% free allocation. The share of sector-specific benchmarking is to reach 77% and has been expanded to a total of 15 sub-sectors: grey clinker, oil refining, domestic aviation, waste, industrial parks, electricity generation, district heating/cooling, steel, petrochemicals, buildings, paper and wood processing, with the addition of semiconductors, displays, and non-ferrous metals as well as fuel use by all industries. EITE sectors receive 100% free allocation if they meet the following criteria:

Carbon intensity x trade intensity \geq 0.1%

Allocation is calculated using:

- Benchmark allocation
- Grandparenting allocation

Auctioning: The auctioning share for the power generation sector will be gradually raised to 50% by 2030. Other non-power sectors will face a 15% auction rate.

Auction supply: 260 million allowances for the entire Phase 4

KAU2026: 17 million allowances

Auctioning represents ~11% of the 2,360 MtCO₂e Phase 4 cap (excluding reserves).

Auctioning share

3%

Total Revenue

KRW 1.55 trillion (USD 1.25 billion) since the beginning of the program

KRW 189.2 billion (USD 133 million) in 2025

2025

Use of Revenues

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

Revenues from auctioning go into the Climate Response Fund, financing NDC-aligned emissions reduction investments, low-carbon technology deployment and commercialization, support for the transition of carbon-intensive sectors and affected stakeholders, and the operation and strengthening of ETS-related infrastructure.

Climate Response Fund Expenditures

Revenue Use Purpose	2022	2023	2024
GHG reduction	USD 697 million	USD 724.1 million	USD 718million
Creating low-carbon ecosystem	USD 472.3 million	USD 467.1 million	USD 445 million
Just transition	USD 134.8 million	USD 149.6 million	USD 144.8 million
Building carbon neutral foundation	USD 423.4 million	USD 460.6 million	USD 350.9 million
Other	USD 77.4 million	USD 23.7 million	USD 96.6 million
Total	USD 1,804.9 million	USD 1,824.9 million	USD 1,755.3 million

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 permitted 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% could be international offset credits).

PHASE 3:

Qualitative limit: The use of offset credits was allowed according to the same qualitative criteria outlined for Phase 2. However, limitations applied 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 2024, there were 317 registered methodologies (211 for CDM and 106 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, 7 million of which were from domestic projects and the remainder from overseas projects, were converted into KCU22s, all of which were used for surrender of emission permits (65 entities).

In the 2023 compliance period, 7.6 million KOCs (1.6 million from domestic projects and 6 million from overseas) were converted into KCU23s. Only 732,872 were submitted for compliance.

In the 2024 compliance period, 1.9 million KOCs (1.7 million from domestic projects and 0.2 million from overseas) were converted into KCU24s. Only 71,491 were submitted for compliance.

Allocation was largely sufficient to cover compliance obligations, which can explain the drop in offset use.

PHASE 4:

Qualitative limit: The use of offset credits is allowed. Domestic credits can be supplied by entities that are not subject to legal obligations under the K-ETS and that began after December 2016, the domestic entry into force of the Paris Agreement. International ex post credits that comply with international rules of Article 6 of the Paris Agreement are accepted. Additionally, credits from old projects that started after 2010 are accepted.

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

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 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 was calculated as follows:

- For 2018 vintage allowances, entities could bank either three times the net sales (total allowances sold minus total allowances bought) or 75,000 allowances for companies emitting >125,000 tCO₂e or 15,000 allowances for companies emitting >25,000 tCO₂e — whichever was higher;
- For KAU19s, the amounts above were 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 was higher;
- For KAU20s, the amount represented 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 applied.

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 (KCU) sold on the secondary market (excluding swaps and auctions).
- In the third and fourth compliance years (2023 and 2024), entities' banking limits were equal to their net number of allowances (total allowances sold minus total allowances bought) and offset credits sold.

Phase 3 allowances and offset credits could only be carried over to the first compliance year of Phase 4 (2026 to 2030). The banking limit in the fifth compliance year (2025) had been expanded to "five times of net sales".

PHASE 4: In the first trading year, entities can borrow up to 30% of their compliance obligation. From the second to fourth trading years, the same borrowing formula as for 2019 applies.

Banking: Gradual easing of carry-over restrictions:

2026: Companies with a surplus can bank allowances equivalent to six times their net sales

2027: Seven times their net sales

2028: Eight times their net sales

2029: Nine times their net sales

2030: Ten times their net sales

The net sales condition is not applied to short companies.

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 tCO₂e emitted.

Compliance Period

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

Monitoring, Reporting, Verification (MRV)

FRAMEWORK:

The legal basis is contained in the “Act on the Allocation and Trading of Greenhouse Gas Emission Allowances” and the “Enforcement Decree of the ETS Act”. Administrative rules on the MRV system are contained in the “Guidelines on Reporting and Certification of Emissions under the Greenhouse Gas Emissions Trading System”.

MONITORING: Monitoring may be conducted either periodically or continuously using approved measurement devices, in accordance with an entity’s monitoring plan, while emissions reporting and third-party verification are carried out on an annual basis. The monitoring plan must define core elements, including company information and organizational boundaries, facility-level monitoring methodologies, activity data measurement points, tier selection, QA/QC procedures, and plans for developing emission factors. MRV requirements also extend beyond the ETS to non-ETS entities designated under the TMS, under which companies with annual emissions below 50,000 tCO₂e (or below 15,000 tCO₂e at the worksite level) are required to submit a verified emissions statement.

REPORTING: Annual reporting of emissions from the previous year must be submitted by the end of March. Liable entities are required to revise and resubmit emission reports which are found to be incorrect.

VERIFICATION: Emissions must be verified by a third-party verifier. Emission reports are reviewed and certified by the Certification Committee of the Ministry of Environment by the end of May.

Penalties and enforcement

The penalty shall not exceed either three times the average market price of allowances of the given compliance year.

Market Regulation

Market Stability Provisions

KOREAN MARKET STABILITY RESERVE (K-MSR)

Instrument type: Quantity-based and price-based instrument

Functioning of the quantity-based mechanism: The fourth allocation plan announced the establishment of a quantity-based K-MSR, which is to be detailed in the first half of 2026, after public consultation. 85 million allowances will be placed in the K-MSR for Phase 4.

Functioning of the price-based mechanism: 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 (USD 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. In 2025, a total of nine market makers were admitted to the K-ETS market.

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 2025 was 21 financial intermediaries). Though they initially could only hold up to 200,000 allowances each, to avoid excessive market shares, this number was increased to 500,000 in December 2022, and to 1 million in 2023.

MARKET TYPES:

Primary: Monthly auctions have been held since 2019. Auctions are open to all companies with compliance obligations under the K-ETS. 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 secondary spot market transactions take place. Allowances, KCUs, and KOCs are traded on the exchange for different vintage years. Consignment trading was launched in November 2025.

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 the “Capital Market and Financial Investment Business Act” apply.

Other Information

Institutions involved

Ministry of Climate, Energy and 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 \(2015 to 2024\)](#)

[Second Basic Plan for the ETS \(2017 to 2026\)](#)

[Third Basic Plan of the ETS \(2021 to 2030\)](#)

[Fourth Basic Plan for the ETS \(2026 to 2035\)](#)

[First Allocation Plan](#)

[Second Allocation Plan](#)

[Third Allocation Plan](#)

[Fourth Allocation Plan](#)

Evaluation / ETS review

The GIR regularly releases evaluation reports with emissions statistics, market indicators, and survey results from covered entities. The 2024 report states that verified emissions from 735 entities receiving allocated allowances totaled 549.9 MtCO₂e in 2023 – 3.9% lower than the previous year (572.0 Mt, 713 entities). All covered entities met their surrender obligations. While certified emissions exceeded allocations in buildings, waste, and public services sectors, all sectors met targets through trading, banking, and offset mechanisms.

Power sector (60 entities): 212.0 Mt, down 18.2 Mt (7.9%) due to lower electricity demand, increased carbon-free generation, and reduced coal/LNG-based generation.

Industry sector (476 entities): 311.3 Mt, down 4.4 Mt (1.4%), driven by global economic slowdown, sluggish construction, and expanded GHG reduction facilities for semiconductor processing.

Buildings sector (40 entities): 4.9 Mt, down 0.05 Mt (0.9%), attributed to reduced city gas consumption from higher temperatures and increased gas prices.

Transport sector (67 entities): 6.7 Mt, down 0.03 Mt (0.5%), reflecting reduced travel distances in railway and aviation, plus increased zero-emission vehicle supply.

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