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2024 KOREAN EMISSIONS TRADING SYSTEM REPORT



Ministry of Environment

Greenhouse Gas Inventory and Research Center

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Notes for Readers

① This report presents the results for 2023, the third compliance year of Phase III (2021–2025) for the Korean Emissions Trading System (K-ETS) (the year in the title of the report is the year of publication). It analyzes the allocation, trading, and surrender of emission permits for covered entities designated in accordance with Articles 8 and 9 of the Act on the Allocation and Trading of Greenhouse-Gas Emission Permits (Act).

② This report is based on greenhouse gas (GHG) emissions and emission permits data provided by the National GHG Management System (NGMS), Emissions Trading Registry System (ETRS), Offset Registry System (ORS), and the Korea Exchange (KRX):

- National GHG Management System (NGMS): a database for the GHG and Energy Target Management System and the K-ETS that collects and manages all data related to the emission activities of business entities, such as emissions reports, implementation plans, performance reports, application forms for allocation, and emissions monitoring plans (<http://ngms.gir.go.kr>)
- Emissions Trading Registry System (ETRS): a computerized system for the registration and management of data related to the allocation, trading, banking, and borrowing of emission permits and certified GHG emissions, etc. (<http://etrs.gir.go.kr>)
- Offset Registry System (ORS): a computerized system for the registration and management of data related to methodologies for external offset projects for the reduction, absorption, or removal of GHGs and certified GHG reductions (<http://ors.gir.go.kr>)
- Korea Exchange (KRX): an emission permit exchange designated in accordance with Article 22 of the Act

③ All numbers in this report are rounded, so some sums and totals may not match.

④ This report uses CO₂ equivalent ton (tCO₂eq.) based on the global warming potential (GWP) for GHGs as the unit for the allocation and surrender of emission permits, and it is marked as t (ton), kt (thousand ton), and Mt (million ton). However, abbreviations (KAU, KCU, and KOC) are used when describing market transactions for emission permits:

- 1 KAU, 1 KCU, 1 KOC : 1tCO₂eq.
- **Korean Allowance Unit (KAU)**: emission permits allocated to covered entities in accordance with Article 12 of the Act
- **Korean Credit Unit (KCU)**: emission permits converted from KOCs in accordance with Article 29 of the Act
- **Korean Offset Credit (KOC)**: certified reductions from external offset projects obtained from the reduction, absorption, or removal of GHGs outside the scope of business operations monitored by the K-ETS in compliance with international standards, in accordance with Article 30 of the Act (※ For ease of use, KOCs are also referred to as a type of emission permit in this report)

2 Summary

1 Overview of the K-ETS

An emissions trading system is a market-based greenhouse gas (GHG) reduction scheme in which the government sets an emissions cap in each of the covered sectors and allocates annual emission allowances to entities that emit more than a certain amount of GHGs, meaning that they can emit GHGs up to the limit set by the emission allowances they hold. It is more cost-effective than direct regulation in that entities participating in the scheme can sell surplus allowances to others through market transactions or make up any deficit in their emission permits through auctions or market transactions.

For Phase I (2015–2017), in order to securely establish the Korean Emissions Trading System (K-ETS) and accumulate experience, the government allocated all emission permits free of charge, applied benchmarking (BM) as an allocation method only for certain sub-sectors, and introduced flexibility mechanisms (e.g., offsetting, banking, and borrowing). For Phase II (2018–2020), with the operational objectives placing emphasis on gradually increasing the size of the reduction in GHG emissions by covered entities, the government enhanced standards for the calculation of the cap and the allocation of emission permits so that they were higher than the level employed in Phase I. In addition, in order to solve problems such as an imbalance in supply and demand for emission permits, the government established standards for the banking of surplus emission permits and implemented measures to activate the emission trading market, such as the introduction of market makers.

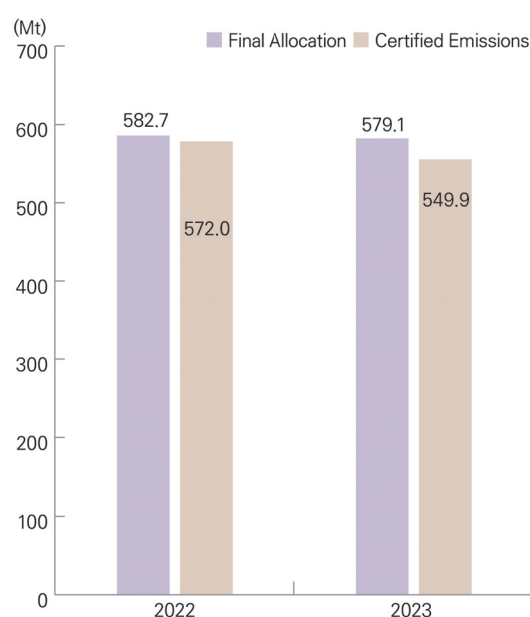
For Phase III (2021–2025), the government established the Master Plan for the Emissions Trading System in December 2019 in order to support the effective achievement of Korea's Nationally Determined Contribution (NDC). The Master Plan focuses on promoting strategies such as further developing allocation methods, encouraging a substantial reduction in GHG emissions, and expanding market functions. For the implementation of these strategies, the government established detailed standards regarding Total Emission Allowances, free allocation and auctions, and benchmark-based allocations through the Allocation Plan for Phase III (2021–2025) of the K-ETS in September 2020.

In October 2021, the government announced an enhanced NDC, which set a target of reducing national GHG emissions by 40% by 2030 compared to 2018 levels. This target was established in light of the legislative intent of the carbon neutrality policy and Korea's role as a responsible member of the international community. In April 2023, the government released the 1st National Basic Plan for Carbon Neutrality and Green Growth, which outlined sector-specific and year-by-year reduction targets aimed at achieving Korea's mid- to long-term GHG reduction goals. Following the announcement of the enhanced NDC and the year-by-year targets, the government revised the Allocation Plan for Phase III (2021–2025) of the Korean Emissions Trading System (K-ETS) in December 2023 and December 2024. These revisions reflected updates to the total emissions cap, measures to revitalize the carbon market, and the relaxation of banking restrictions to support greater flexibility for covered entities.

2 K-ETS Operational Results

For the 2023 compliance year, the pre-allocated emissions amounted to 567.4 Mt (684 entities), while the final allocation amount, which reflected changes such as additional allocations, allocation revocations, and the succession of rights and obligations, was 579.1 Mt (735 entities).¹⁾ The final allocation in 2023 was 0.6% lower than the previous year (582.7 Mt), which was due to a decline in the amount of valid bids for emission allowances, which led to a decrease in the amount of allocation changes after the pre-allocation of emission allowances. The final allocation amount (579.1 Mt) consisted of 573.2 Mt of free allocations (99.0%) and 5.9 Mt of auctioned allowances (1.0%).

According to the results of the government verification of the emissions reports submitted by the 735 entities that received allocated emission allowances, the certified emissions for 2023 amounted to 549.9 Mt, 3.9% lower than the previous year (572.0 Mt, 713 entities). The emission permits surrendered by covered entities in the 2023 compliance year amounted to 549.9 Mt (733 entities), made up of 548.9 Mt from Korean Allowance Units (KAUs) (99.8%) and 1.1 Mt from Korean Credit Units (KCU) (0.2%). The amount of KAUs and KCUs surrendered both decreased. In the 2023 compliance year, all covered entities met their obligation to surrender emission permits.



〈Final Allocation and Emissions in the 2022–2023 Compliance Year〉

In addition to emission permits allocated by the government, emission permits banked from the previous compliance year, emission permits borrowed from the next compliance year, or KCUs may be utilized by covered entities to meet their obligation to surrender emission permits. The emission permits banked from the 2022 compliance year to the 2023 compliance year by covered entities to surrender and

1) A total of 21 entities have been added due to new entries and the succession of rights and obligations (i.e., designation of new covered entities arising from, for example, the splitting of covered entities).

trade emission permits amounted to 39.3 Mt (509 entities). The emission permits carried over to the next compliance year (2024) after their surrender for 2023 amounted to 70.0 Mt (540 entities). The emission permits borrowed from the next compliance year accounted for 0.5 Mt (41 entities), which was used only in the surrender of emission permits. In addition, for the 2023 compliance year, a total of 0.7 Mt of Korean Offset Credits (KOCs) (0.5 Mt from domestic projects and 0.2 Mt from overseas projects) was converted into KCU23. These, combined with the KCUs banked from the previous compliance year, were used for the surrender of emission permits (1.1 Mt, 21 entities).

Broken down by sector, the certified emissions exceeded the final allocation amount in the buildings, waste, and public services/other sectors. However, in all sectors, an amount of emission permits equivalent to the amount of certified emissions was surrendered (i.e., emission targets were met) through the use of the trading and banking of emission permits and offset mechanisms

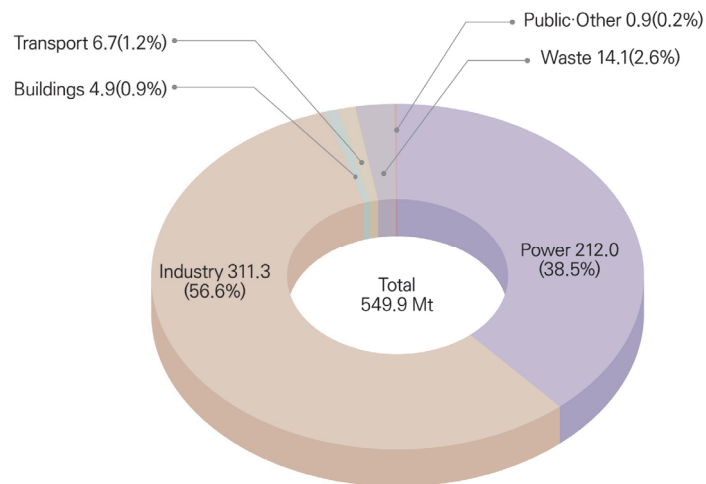
For the 2023 compliance year, the certified emissions from the power sector (60 entities) amounted to 212.0 Mt, which was 18.2 Mt (7.9%) lower than the previous year. This reduction was caused by a decline in total power generation due to lower electricity demand, an increase in carbon-free power generation, and a reduction in coal and LNG-based power generation.

The certified emissions from the industry sector (476 entities) decreased to 311.3 Mt, which was lower than the previous year by 4.4 Mt (1.4%). Factors such as the global economic slowdown, the sluggish construction industry, and the expanded operation of GHG reduction facilities for semiconductor processing led to a decrease in GHG emissions.

The emissions from the buildings sector (40 entities) decreased to 4.9 Mt, which was lower by 0.05 Mt (0.9%) compared to the previous year. This reduction was attributed to a decline in city gas consumption caused by higher average temperatures and increased city gas prices.

In the transport sector, the emissions from the railway and aviation industries declined due to reduced travel distances and an increase in the supply of zero-emission (i.e., electric and hydrogen-powered) vehicles. As a result, the emissions from the 67 covered entities in this sector decreased to 6.7 Mt, which was lower by 0.03 Mt (0.5%) compared to the previous year.

The certified emissions from the waste and public services/other sectors remained similar to the previous year at 14.1 Mt (88 entities) and 0.9 Mt (2 entities), respectively.



〈Certified Emissions by Sector in the 2023 Compliance Year〉

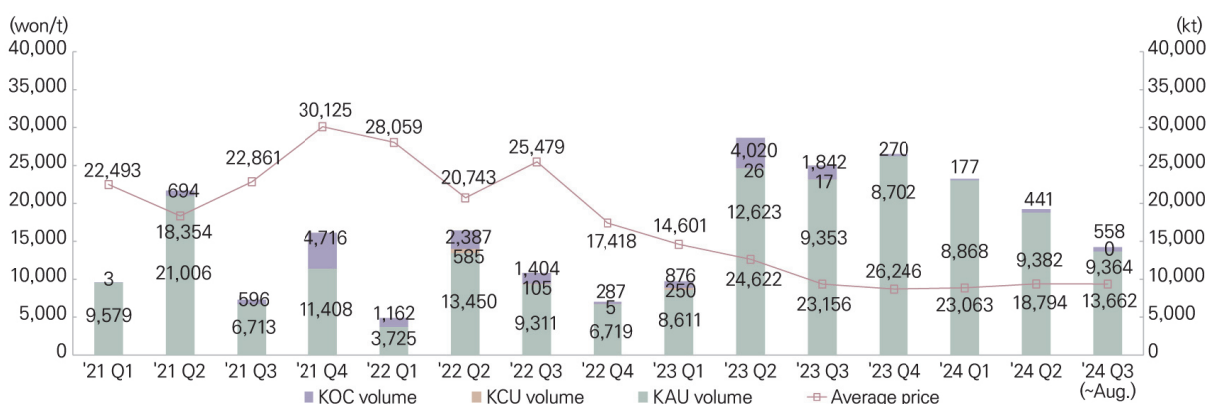
3 Analysis of Emissions Trading Market Performance

From Phase I to the end of the 2023 compliance year in Phase III (August 2024), a total of 414.0 Mt of emission permits were traded through the exchange and Over-The-Counter (OTC) markets, with total payments of 7,919.9 billion and an average trading price of 19,131 won per ton.

Of these permits, 364.4 Mt of KAUs (88.0%), 4.4 Mt of KCUs (1.1%), and 45.2 Mt of KOCs (10.9%) were traded. Broken down by market type, the trading volume was 253.3 Mt (61.2%) in the exchange market and 160.7 Mt (38.8%) in the OTC market. The yearly trading volume increased at an average annual rate of 103% from 5.7 Mt in 2015 to 47.5 Mt in 2018. Subsequently, it fluctuated, with 38.1 Mt in 2019, 44.0 Mt in 2020, 54.7 Mt in 2021, 39.1 Mt in 2022, and 89.9 Mt in 2023. The trading volume reached 56.7 Mt by August 2024, representing a slight decrease (6.3%) compared to the same month of the previous year (60.5 Mt).

The average trading price for all emission permits per year increased significantly at an average annual rate of 22.5% from 11,013 won in 2015 to 30,411 won in 2020. Since then, due to the impact of COVID-19, lower production activity, and the damage caused by Typhoon Hinnamno, it declined to 23,149 won in 2021, 22,370 won in 2022, 10,772 won in 2023, and 9,167 won in 2024 (as of August). The average trading price for Phases I, II, and III was 19,131 won.

The continuous increase in the trading volume and average trading price from 2015 led to an increase in total payments from 62.4 billion won in 2015 to 1,338.5 billion won in 2020. A subsequent decline was then observed, with total payments amounting to 1,266.6 billion won in 2021, 875.6 billion won in 2022, and 968.8 billion won in 2023. The total payments for emission permits for 2024 amounted to 519.7 billion won, representing a 46.4% decrease from the previous year.

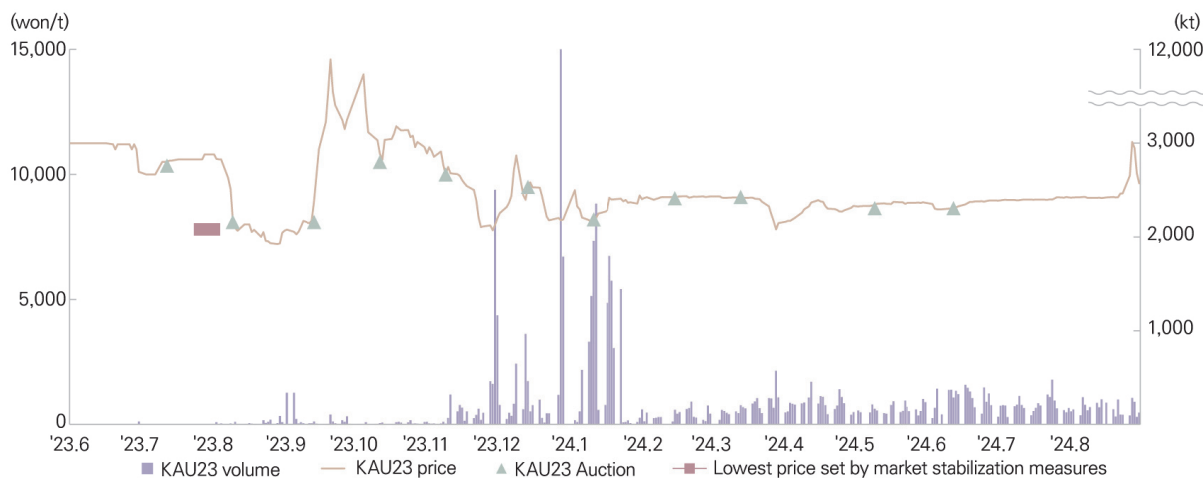


〈Trends in the Trading Volume and Price by Compliance Year〉

The total volume of KAU23, KCU23, and KOCs traded during the period for which KAU23 was listed on the KRX (January 2021–August 2024) as the primary type of emission permit traded for the 2023 compliance year was 102.1 Mt. Of this, KAU23 accounted for 82.7 Mt (81.0%) and KOCs for 19.4 Mt (19.0%). No transactions were recorded for KCU23 (0%). Broken down by market type, of the 82.7 Mt of KAU23 traded, the trading volume was 73.9 Mt (89.4%) in the exchange market and 8.8 Mt (10.6%) in the OTC market. Specifically, the amount of KAU23 traded via real-time exchange trading was 67.6 Mt, which accounted for the highest proportion of the trading volume for KAU23, followed by trading via auction (5.9 Mt), OTC trading (8.8 Mt), and block exchange trading (0.4 Mt). Of note was that the proportion of exchange trading for KAU23 has grown compared to KAU22 (87.9% for the exchange market and 12.1% for the OTC market) due to an increase in real-time exchange trading.

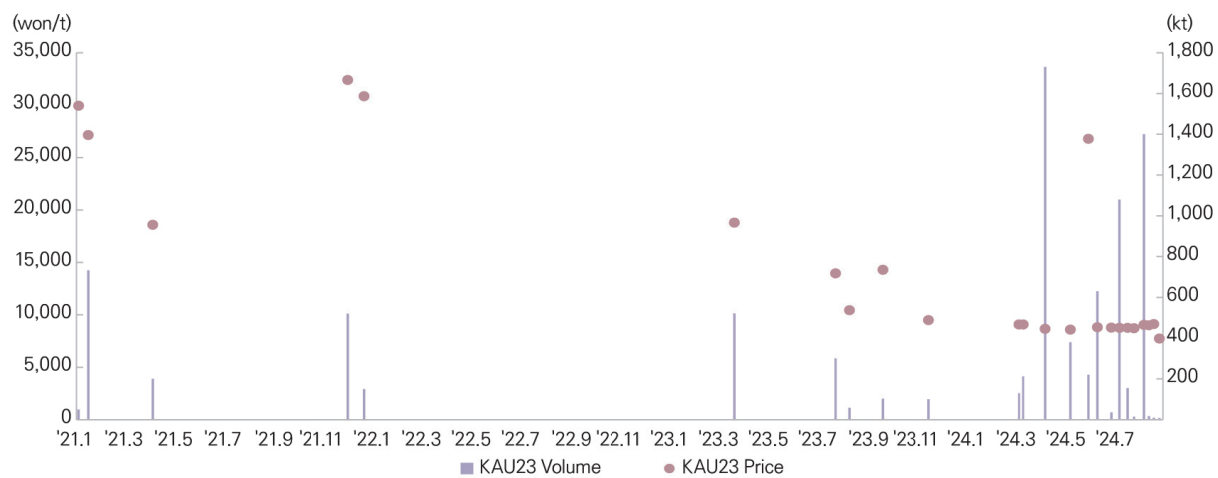
The trading price of KAU23 on the exchange ranged between 7,200 and 14,600 won. The monthly average price remained relatively stable at 10,339 won in June 2023 and 10,500 won in July, but showed a declining trend thereafter 7,829 won in August, 9,271 won in September, 11,485 won in October, 8,423 won in November, and 8,456 won in December. In 2024, from January to August, the average trading price ranged between 8,500 and 9,500 won. The final average trading price of KAU23 on the exchange was 8,684 won.

The auction price for KAU23 was 10,350 won in July 2023 when the auctions began, reaching 8,100 won in August and September and 10,500 won in October. It fell to 10,000 won in November, 9,500 won in December, and 8,200 won in January 2024. The price remained between 8,650 won and 9,100 won between February and June. The average auction price for KAU23 was 9,351 won.



〈Trends in Trading Volume and Price for KAU23 in the Exchange Market〉

OTC trading of KAU23 began on 6 January 2021. Until December 2021, trading occurred sporadically in the price range between 18,500 won and 32,000 won. The trading price of 32,400 won for December 2021 was the highest OTC trading price for KAU23. Subsequently, there were no transactions from January 2022 to February 2023. Transactions resumed in March 2023, with the price remaining in the 18,000 won range for March, until it fell sharply to a range of 10,400–14,300 won between July and September. Except for one transaction, KAU23 was traded in a price range of 8,500–9,500 won between November 2023 and July 2024. In August 2024, one transaction occurred at the lowest OTC trading price of 7,750 won before the end of the 2023 compliance year. Ultimately, the overall average OTC trading price for KAU23 was 13,759 won, which was 58.4% higher than its overall average exchange trading price.



〈Trends in Trading Volume and Price for KAU23 in the Over-The-Counter Market〉

4 Analysis of a Survey of Covered Entities

A survey was conducted with covered entities that were able to meet their obligation to surrender emission permits for the 2023 compliance year regarding their views of and response to the K-ETS and the GHG emission reduction efforts and performance. The total number of responses was 318, representing a response rate of 43.4%.

Continuing from the previous year, covered entities were generally supportive of the K-ETS (positive: 78.0%; negative: 4.1%) and considered the K-ETS to be necessary for achieving Korea's NDC (positive: 72.9%; negative: 5.7%) and for the transition to a sustainable society despite the costs of responding to it (positive: 68.9%; negative: 6.6%). In addition, the responding covered entities reported that the K-ETS contributes to achieving GHG reduction targets in a cost-effective manner (positive: 47.8%; negative: 14.5%), that they have actively participated in emissions trading (positive: 71.7%; negative: 5.3%), that they have adopted technological development and management innovation measures for emissions reduction (positive: 44.7%; negative: 20.1%), and that they have actively secured a reduction in GHG emissions (positive: 51.2%; negative: 15.8%). It was found that, despite the management burden caused by reasons such as an increase in production costs for products/services, the covered entities have made efforts to respond to the K-ETS by increasing investment in the use of external consulting services and the application of low-carbon technologies.²⁾

However, it appears that these efforts have not yet led to a strengthening of corporate competitiveness or an increase in corporate profit. The proportion of negative responses was higher than that of positive responses regarding the following survey items: an increase in additional profits from emission permit trading, a reduction in operational and management costs through internal emission reduction efforts, the strengthening of corporate competitiveness at the domestic/international level through environmental business operations, and the strengthening of product/service competitiveness against other products/services in the same industry through internal innovation.³⁾

2) An increase in production costs for products/services due to the rise in prices of energy/raw materials (positive: 56.3%; negative: 9.4%); an increase in the costs of external consulting services to respond to the K-ETS (positive: 46.2%; negative: 24.9%); an increase in the costs of exploring and applying low-carbon technologies (positive: 33.3%; negative: 29.3%); increased investment in reduction technologies for management and process improvement (positive: 44.6%; negative: 24.3%); an increase in the costs of establishing a taskforce and securing manpower to respond to the K-ETS (positive: 25.4%; negative: 38.8%).

3) An increase in additional profits from emission permits trading (positive: 32.1%; negative: 40.9%); a reduction in operational and management costs through internal emission reduction efforts (positive: 25.2%; negative: 36.4%); the strengthening of corporate

Regarding the anticipated impact of the expansion of entities voluntarily participating in the K-ETS, the respondents reported that it will contribute to reducing GHG emissions and increasing awareness of the K-ETS (positive: 61.9%; negative: 11.9%), achieving Korea's NDC (positive: 53.5%; negative: 14.1%), and revitalizing emissions trading (positive: 55.0%; negative: 14.8%). It was found that there were more positive responses than negative ones for the activation of investment in the development and utilization of reduction technologies (positive: 37.4%; negative: 21.1%). In addition, the proportion of negative responses was higher than that of positive responses for the idea that most companies will voluntarily participate in the K-ETS (positive: 26.8%; negative: 41.8%).

The high proportion of neutral responses for the market-making system and third-party participation in emissions trading indicates that covered entities did not have clear views on the performance of these measures. However, the proportion of positive responses was higher than that of negative responses for all survey items related to the impact of the market-making system on the emissions trading market.⁴⁾ With regard to the impact of third-party trading, the proportion of positive responses was higher than that of negative responses regarding its contribution to improving the liquidity of the market through the expansion of market participants (positive: 57.5%; negative: 10.1%) and to stabilizing the emission permit price (positive: 42.8%; negative: 18.8%). This contrasts with the previous year's survey results, which expressed concerns about a potential decline in allowance prices due to third-party market participation, and appears to reflect increased expectations for brokerage trading among allocation entities as its introduction approaches. A higher proportion of respondents gave positive answers to questions on whether brokerage trading would help improve the oversupply of allowances (positive: 42.2%, negative: 19.1%) and contribute to vitalizing the K-ETS (positive: 56.0%, negative: 8.5%). This contrasts with the previous year's survey results, which expressed concerns over a potential decline in allowance prices due to third-party market participation. As the introduction of consignment trading drew nearer, it appears that allocation entities developed heightened expectations toward the system. A greater proportion of respondents provided positive responses to questions regarding the

competitiveness at the domestic/international level through environmental business operations (positive: 22.7%; negative: 33.3%); the strengthening of product/service competitiveness against similar products/services in the same industry through internal innovation (positive: 18.2%; negative: 37.1%).

4) Contribution to ensuring the on-exchange liquidity of emission permits through bid-ask spread reduction (positive: 43.8%; negative: 12.2%); contribution to revitalizing emissions trading (positive: 47.8%; negative: 14.8%); contribution to mitigating sudden fluctuations in emission permit prices (positive: 39.3%; negative: 17.9%); contribution to establishing prices by proposing the bidding or asking price (positive: 37.1%; negative: 17.0%).

improvement of allowance oversupply (positive: 42.2%, negative: 19.1%) and the contribution to the activation of the emissions trading market (positive: 56.0%, negative: 8.5%).

In the 2023 compliance year, the most commonly used additional method by companies submitting allowances through means other than allocated allowances was allowance purchases (60.0%), followed by technological investment and internal abatement activities (13.1%), and allowance borrowing (10.6%), consistent with the previous year.

Companies with surplus allowances overwhelmingly preferred banking to the next compliance year (84.2%) over selling on the market (15.8%).

The main reasons cited included expectations of increased emissions due to business growth and expanded production, postponement of sales decisions due to market and policy uncertainty, and anticipated price increases due to insufficient supply on the exchange.

The survey results on the forthcoming implementation of the EU's Carbon Border Adjustment Mechanism (CBAM) indicated that respondents were aware of the CBAM and the need to respond to it, have monitored ongoing discussions on its design, and are currently engaged in discussions to formulate response strategies. However, negative responses outweighed positive ones regarding the establishment and initiation of response strategies, the use of external institutions to respond to the CBAM, and the use of government support programs to respond to the CBAM.

The respondents reported that they believed the implementation of the CBAM will have a significant impact on business operations and were concerned about a possible decline in corporate profits due to trade suspensions, reduced trade volumes, or a decline in price competitiveness. They anticipated that investment in emission reduction technologies will increase, dedicated organizational units and personnel to respond to the CBAM will be needed, parent companies' demands for data submission and carbon reduction will increase, and the management of partner companies will be strengthened to establish low-carbon, environmentally friendly supply chains.

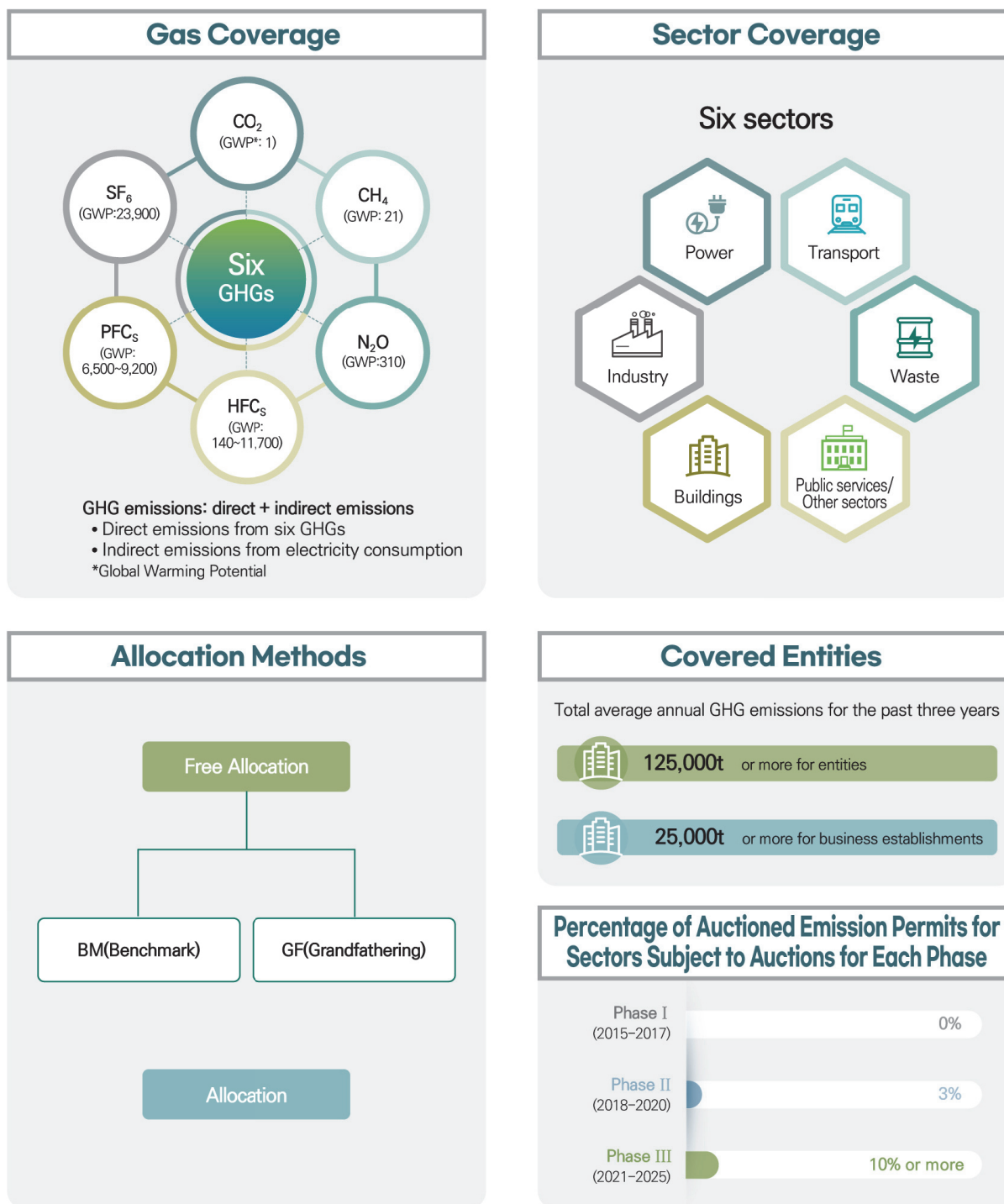
The covered entities reported that they have made efforts to reduce GHG emissions by participating in the K-ETS. They responded that their participation in the K-ETS has contributed to the establishment of mid- to long-term strategies for GHG reduction, improvement of internal processes for energy

conservation, efforts to reduce indirect GHG (Scope 2) emissions, and efforts to reduce direct GHG emissions. However, it was found that investment in external projects has not increased.

In terms of internal emission reduction activities in Phase III, 38.7% of the responding entities reported that they were currently implementing these activities, while 9.4% reported having plans to implement these activities and 51.9% reported that they had not implemented these activities. The most common internal reduction activity that was in progress or planned was the installation of high-efficiency equipment and the improvement of equipment performance, followed by power generation and self-consumption using renewable energy, the recovery and utilization of unused thermal energy, and conversion to low-carbon fuels. On the other hand, in terms of external emission reduction activities, an overwhelming majority of the responding entities (89.0%) responded that they had not implemented these activities nor did they plan to. The most common external reduction activities that were in progress or planned were fuel conversion projects and the use of new renewable energy.

K-ETS at a Glance

1. K-ETS Overview



Reserve



Market Stabilization

Additional allocation to manage the market price and liquidity, which is deemed necessary when the price of emission permits suddenly fluctuates or the supply of emission permits falls noticeably short of demand, thus making trading between covered entities difficult, etc.

Market Making

A market maker such as a public financial institution suggests a standard price for emission permits and participates in the trading market to ensure market liquidity

Use for Other Purposes*

Adjusting allocation, such as allocation to new entrants and voluntarily participating entities, additional allocation for the establishment and expansion of facilities, and additional allocation for reduction contributions

*This reserve is divided into "power" and "other" in order to ensure fairness between sectors

Flexibility Mechanisms



Offset

If a covered entity possesses or acquires GHG reduction credits generated outside the scope of business operations monitored by the K-ETS, it may convert all or part of them into emission permits, which can be used for trading or compliance

Banking

Surplus emission permits may be carried over to the next compliance year

Borrowing

If emission permits are insufficient to meet the surrender obligation, portion of allocated emission permits may be borrowed from the

Calculation of the Cap

Step 1



• Calculate the average sectoral reduction targets for the relevant phase

Step 2



• Calculate the sectoral emissions coverage* from the ETS for the base year

*ETS emissions coverage = average emissions of covered entities for the base year / average national emissions for the base year

Step 3



• Calculate the sectoral ETS cap* for the relevant phase

*sectoral ETS cap = average sectoral reduction targets for the relevant phase x ETS emissions coverage for the base year

Step 4



• Calculate the ETS cap for the relevant phase (i.e., summing the ETS cap for each sector)

2. K-ETS Operational Results

Number of Covered Entities by Compliance Year

Type	2015	2016	2017	2018	2019	2020	2021	2022	2023
Pre-allocation & New entities	525	525	525	591	587	604	684	684	684
Final allocation entities	522	564	592	587	611	637	687	714	735
Certified entities	522	560	591	586	610	636	687	713	733

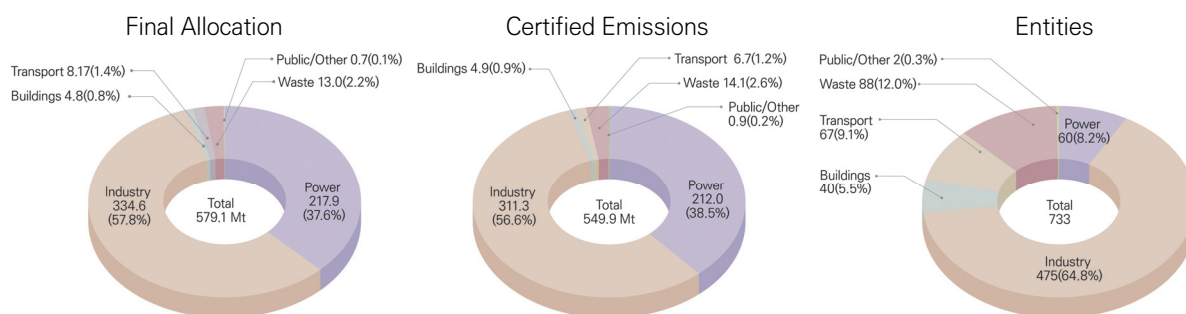
1) Pre-allocation and new entities: number of entities designated for pre-allocation and new entry allocation before the commencement of a compliance year

2) Final allocation entities*: number of entities after reflecting all changes that occur after pre-allocation and new entry allocation

3) Certified entities*: number of entities holding the obligation to surrender emission permits

* The designation of covered entities or the obligation to surrender emission permits can be canceled due to allocation revocation or mergers according to succession of rights and obligations during a compliance year

Distribution by Sector – Compliance Year 2023



Compliance Results by Compliance Year

2015	2016	2017	2018	2019	2020	2021	2022	2023
99.8%	100.0%	99.7%	99.8%	99.8%	99.8%	99.9%	100.0%	100.0%
(521/522)	(560/560)	(589/591)	(585/586)	(609/610)	(635/636)	(686/687)	(713/713)	(733/733)

Annual Trading Market Performance

Type	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024*
Trading volume (Mt)	5.7	12.0	26.3	47.5	38.1	44.0	54.7	39.1	89.9	56.7
Average price (KRW/t)	11,013	17,056	20,951	22,120	28,440	30,411	23,149	22,370	10,772	9,167
Payments (100 mil. KRW)	624	2,041	5,503	10,509	10,831	13,385	12,666	8,756	9,688	5,197

* Note : Trading records until August 2024

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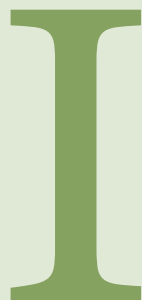
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K-ETS Overview

1. Overview and Operational Direction of the K-ETS
2. Operation of the K-ETS

1

Overview and Operational Direction of the K-ETS

1.1 Overview

An emissions trading system is a market-based greenhouse gas (hereafter “GHG”) reduction scheme in which the government sets an emissions cap and allocates annual emission allowances to entities emitting more than a certain amount of GHGs so that they can emit GHGs up to the limit set by the emission allowances they hold. If a covered entity emits a lower amount of GHGs than the emission permits it secures, it can sell the surplus through market transactions. Conversely, if a covered entity emits a higher amount of GHGs than its emission permits allow, it can make up the deficit through auctions or market transactions. In this sense, the emissions trading system is more cost-effective than direct regulation in terms of reducing GHG emissions.

The Korean Emissions Trading System (hereafter “K-ETS”) was launched in 2015, with its legal basis established in 2012 through the enactment of the Act on the Allocation and Trading of Greenhouse-Gas Emission Permits (May 2012) (hereafter “the Act”) and the associated Enforcement Decree of the Act (November 2012) (hereafter “the Enforcement Decree”), followed by the establishment of the Master Plan for the Emissions Trading System (January 2014), the Allocation Plan for Phase I (2015–2017) (September 2014), and relevant guidelines, which stated the Total Emission Allowances that were connected with Korea’s Nationally Determined Contribution (hereafter “NDC”) and provided details of the operation of the K-ETS.

► **Summary of the K-ETS Operational Results for the Second Compliance Year of Phase III (2022)**

In 2022, which was the second compliance year of Phase III, a total of 582.7 Mt of emission allowances (570.1 Mt from free allocation and 12.6 Mt from auctioned allowances) were allocated to 714 entities from 69 sub-sectors. The final amount of certified emissions at the end of the 2022 compliance year was 572.0 Mt from 713 entities, which was 3.2% lower than the previous year (591.0 Mt from 687 entities). The total amount of KAU22 traded through the exchange and Over-The-Counter (hereafter “OTC”) markets, including auctions, from January 2021 to August 2023 was 69.1 Mt. The final amount of emission permits surrendered by covered entities to the government at the end of the 2022 compliance year was 572.0 Mt from 713 entities (564.4 Mt of KAUs and 7.6 Mt of KCUs). All covered entities met their obligation to surrender emission permits. In addition, after the surrender for 2022, 39.3 Mt of emission permits were carried over to the third compliance year (2023).

〈Table I -1〉 Operational Direction by Phase in the Master Plan

Type	Phase I (2015–2017)	Phase II (2018–2020)	Phase III (2021–2025)
Main Objectives	Acquire experience and stabilize the K-ETS	Substantially reduce GHG emissions	Promote effective reductions
Operations	- Improve flexibility e.g., the ratio of offset credits, etc. - Establish necessary infrastructure for accurate Monitoring, Reporting, and Verification (MRV)	- Expand the applicable scope and raise the targets - Develop various standards, e.g., emissions reporting, verification, etc.	- Reinforce the cap based on the Roadmap - Expand market functions by strengthening the functions of market makers, introducing derivatives in the exchange, etc.
Allocation	- Allocate all emission permits free-of-charge - Apply lessons learned from the GHG and Energy Target Management System	- Introduce auctions - Develop allocation methods, e.g., benchmarking, etc.	- Improve the criteria for selecting sub-sectors eligible for free allocation and expand the ratio of auctions - Expand the use of benchmarking for allocation

For Phase II (2018–2020), the government expanded the scope of the K-ETS and adjusted specific emission reduction targets to be consistent with Korea's NDC in order to raise emission reduction targets so that they were higher than the level achieved in Phase I and gradually increase the size of the reduction in GHG emissions by covered entities. To this end, in 2017, the government prepared the Master Plan for the Emissions Trading System for Phase II (January 2017) to establish the basic direction for the K-ETS during Phase II and the Allocation Plan for Phase II: Step 1 (2018–2020) (December 2017) to establish detailed regulations for the K-ETS, including the cap.

In 2018, an amendment to the Basic Roadmap for Achieving 2030 National GHG Reduction Targets (July 2018) (hereafter “the amended Roadmap”) was completed, and the government subsequently announced the Allocation Plan for Phase II: Step 2 (2018–2020) (July 2018), which reflected the amended Roadmap and added further detailed standards, such as Total Emission Allowances (1,796.1 Mt) and standards for auctions and benchmark-based allocations.

An imbalance in the supply and demand for emission permits arose during Phase II as a result of surplus emission permits not being traded due to unrestricted permission for the banking of surplus emission permits. In order to solve this problem, in June 2019, the government amended the Allocation Plan for Phase II: Step 2 (2018–2020) and introduced new criteria for the banking of emission permits.

In December 2019, the government prepared the Master Plan for the Emissions Trading System for Phase III, which aimed to pave the way for the achievement of Korea's NDC. The Master Plan established strategies to further develop allocation methods, substantially reduce GHG emissions, and expand market functions in order to strengthen the efficacy of the K-ETS. In addition, the Allocation Plan for Phase III (2021–2025) (September 2020), which contained detailed standards such as Total Emission Allowances (3,082.3 Mt), standards for free allocations and auctions, and benchmark-based allocations was established for the implementation of these strategies.

In October 2021, the government announced the updated NDC, under which the country has set an enhanced target of reducing its total national GHG emissions by 40% from the 2018 level by 2030, with the aim of achieving the goal of carbon neutrality.⁵⁾ The enhanced NDC was adopted in close consideration of the purpose of Korea's carbon neutrality policy and its role as a member of the international community.

Phase III of the K-ETS commenced in 2021. The K-ETS, which was developed with the goal of establishing a stable system in Phase I and reducing national GHG emissions significantly in Phase II, has played a pivotal role in achieving Korea's NDC. Institutional improvements, such as the revitalization of the emissions trading market, improvement of allocation methods, and adjustment of the emissions cap, are required to efficiently support the achievement of the enhanced NDC.

5) The Framework Act on Carbon Neutrality and Green Growth for Coping with Climate Crisis stipulates the government shall set the target of reducing national GHG emissions by a minimum of 35% from the 2018 level by 2030 (Art. 8(1)). The amount of GHG emissions in 2018 was 727.6 Mt, and the target amount of GHG emissions for 2030 is 436.6 Mt.

〈Table I -2〉 National Policies for GHG Reductions and the K-ETS in Phase II and III

Type		Phase II (2018–2020)	Phase III (2021–2025)
National Policies for GHG Reductions	Reduction target	• Reduction by 37% from BAU (Business –as–usual) levels in 2030 (Jun. 2015)	• Reduction by 40% of the total GHG emissions in 2018 by 2030 (Oct. 2021)
	Sectoral plan	• Basic roadmap for achieving 2030 national GHG reduction targets (Dec. 2016)	• Amendment to the basic roadmap for achieving 2030 national GHG reduction targets (Jul. 2018) • 1st National Basic Plan for Carbon Neutrality and Green Growth(Apr, 2023)
GHG Emissions Trading System	Master plan	• Master plan for the Emissions Trading System for Phase II (Jan. 2017)	• Master plan for the Emissions Trading System for Phase III (Dec. 2019)
	Allocation plan	• Allocation Plan for Phase II: – Step 1 (Dec. 2017) ¹⁾ – Step 2 (Jul. 2018) ²⁾ – Step 2 amended (Jun. 2019) ³⁾	• Allocation plan for Phase III (Sep. 2020) ⁴⁾ – Amended (Dec. 2023) ⁵⁾ – Amended (Dec. 2024) ⁶⁾

1) Details on the allocation for Phase II, and the cap (538.5 Mt) for the first compliance year (2018) and reserve (14.0 Mt) are specified.

※ It was decided that the cap for Phase II would be determined in the Allocation Plan for Phase II: Step 2, taking into consideration the national policies including the amended Roadmap (2018). The amount of emissions allowances for 2018 (Allocation Plan Step 1) would be maintained and guaranteed after the amount of emissions allowances for the Allocation Plan Step 2 was determined, however, the emission permits for 2019 would adjusted if those for '18 increased or decreased.

2) Details for Phase II, such as the cap (1,777.1 Mt), total emissions allowances (1,796.1 Mt), and standards for auctions and benchmark-based allocation were added and specified.

3) Standards for the banking of emission permits across compliance years within Phase II and etc. were revised.

4) Details on the allocations for Phase III and the cap (3,048 Mt) and reserve (34.0 Mt) were specified.

5) The cap for Phase III was adjusted (increased by 12.7 Mt) following the update of Korea's NDC, and the standards for the banking and offsetting of emission permits, etc. were revised for the revitalization of the emissions trading market.

6) Revision of Banking standards for KAU and KCU under the Flexibility Mechanism.

〈Table I -3〉 Guidelines for the K-ETS in Phase III

Type	Guidelines
Allocation· Revocation	Guidelines for the Allocation and allocation revocation of GHG emission permits (Ministry of Environment, partially amended in February 2025)
Reporting· Certification	Guidelines for the Reporting and certification of emissions under the GHG Emissions Trading System (Ministry of Environment, partially amended in February 2025)
Verification	Guidelines for the Verification for the operations of the GHG Emissions Trading System (Ministry of Environment, partially amended in August 2024)
Emissions Trading	- Regulations for the Additional allocation of emission permits for auctions and market stabilization measures (Ministry of Environment, partially amended in February 2025) - Notification on GHG emission permits trading (Ministry of Environment, partially amended in May 2018) - Notification on Qualifications and evaluation standards for an emission permits exchange (Ministry of Environment, partially amended in February 2025) - Notification on the Supervision of an emission permits exchange (Ministry of Environment, partially amended in February 2025) - Notification on the Designation and operations of market makers in the emission permits trading market (Ministry of Environment, partially amended January 2021) - Notification on Emissions trade brokerage companies (Ministry of Environment, newly enacted in February 2025)
Offset mechanisms	Guidelines for the Feasibility Assessment of Offset Projects and the Certification of Reductions (Ministry of Environment, partially amended in November 2023)

1.2. Operating Process for the K-ETS

Covered entities that receive allocated emission allowances in accordance with the allocation plans must prepare a GHG Emissions and Energy Usage Report (hereafter “emissions report”) by compiling their GHG emission activities undertaken during the relevant compliance year (1 January–31 December). This report must be verified by an external verification institution and submitted to the government together with a verification report from the verification institution. The government then evaluates the amount of GHG emissions specified in the report and certifies the emissions.

Covered entities must surrender their emission permits to the government in an amount equivalent to the amount of certified emissions within eight months from the date of completion of each compliance year. In the event the amount of emission permits held by a covered entity is insufficient, the covered entity may, before surrendering its emission permits, make up for the deficit by purchasing emission permits from the market or by using carried-over or borrowed emission permits, while, if the amount of emission permits exceeds the amount of certified emissions, they can sell the surplus. Covered entities from sub-sectors eligible for auctions can also participate in auctions. The law-based operating schedule for the K-ETS is presented in <Figure I-1>.⁶⁾

6) The amount of certified emissions, which serves as the basis for determining the amount of emission permits to be surrendered, is assessed for each compliance year (1 Jan.–31 Dec.). However, emission permits for free allocation are registered to the relevant entity's account before the commencement of a compliance year, and these emission permits can be traded from the date of registration until the date of surrender (exchange trading is possible after the listing of tradable permits on the KRX).

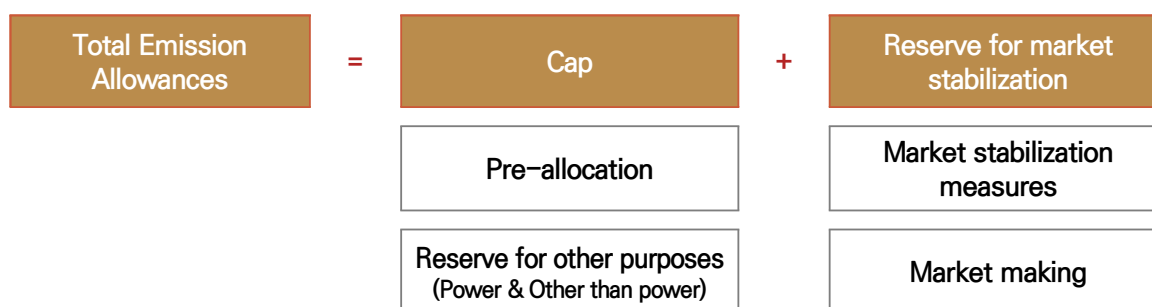


〈Figure I -1〉 Schedule for the K-ETS

2 Operation of the K-ETS

2.1 Cap

The cap is the total amount of GHG emissions that all covered entities are allowed to emit during a phase, and this is managed by the K-ETS as the emissions target. In addition to the cap, a separate reserve is established, and the sum of the two is the Total Emission Allowances. The reserve is divided according to three purposes: (i) market stabilization measures, (ii) market-making and liquidity management, and (iii) other purposes (power and those other than power).⁷⁾ The reserve for market stabilization measures and the reserve for market-making and liquidity management operate separately from the cap, whereas the reserve for other purposes is included in the cap.



〈Figure I -2〉 Concept of Total Emission Allowances

The cap is established based on the Basic Roadmap for Achieving 2030 National GHG Reduction Targets as provided under Article 5(1) of the Act. The method of calculation used to establish the cap for Phase III is illustrated in 〈Figure I-3〉.

⁷⁾ Taking into consideration of factors such as the scale of GHG emissions and differences in the application criteria for the additional allocation of emission permits, the reserve allocated to other purposes is divided into those related to power and those that are non-power-related.

Step 1	Calculate the average sectoral GHG reduction targets (based on the Roadmap for the Updated NDC (2023)) for Phase III (2021–2025)
Step 2	Calculate the sectoral emissions coverage from the ETS* for the base years (2017–2019) * ETS emissions coverage = average emissions of the covered entities (2017–2019) / average national emissions (2017–2019)
Step 3	Calculate the sectoral ETS cap* for Phase III (2021–2025) * Sectoral ETS cap (2021–2025) = average sectoral reduction targets (2021–2025) × ETS emissions coverage (2017–2019)
Step 4	Calculate the overall ETS cap for Phase III (2021–2025) (i.e., summing the cap for each sector)

〈Figure I -3〉 Calculation for the Cap for Phase III

〈Table I -4〉 Total Emission Allowances for Phase III

(Unit : Mt)

Type			2021	2022	2023	2024	2025	Total amount
Total emissions allowances			–	–	–	–	–	3,069.5
Reserve	Market stabilization measures ¹⁾		–	–	–	–	–	14.0
	Market making ²⁾		–	–	–	–	–	20.0
	Other purposes ³⁾	Power	–	–	–	–	–	69.8
		Other than power	–	–	–	–	–	63.6
Pre-allocation			589.3	589.3	589.3	567.1	567.1	2,902.1
Power sector ⁴⁾	Power in general		215.1	215.1	215.1	197.9	197.9	1,041.1
	Other power-related		5.0	5.0	5.0	4.7	4.7	24.6
	Integrated energy supply (Industrial)		14.9	14.9	14.9	14.3	14.3	73.3
Industry sector			328.5	328.5	328.5	325.4	325.4	1,636.3
Buildings sector			4.8	4.8	4.8	4.7	4.7	23.7
Transport sector			8.3	8.3	8.3	8.0	8.0	41.0
Waste sector			12.0	12.0	12.0	11.3	11.3	58.5
Public services/Other sectors			0.77	0.77	0.77	0.74	0.74	3.8

1) This reserve is utilized for the additional allocation of emission permits for the stabilization of prices, etc., in case of the following abnormalities in the emissions trading market (Art. 18, subpara. 3 and Art. 23(1) of the Act; Art. 38 of the Enforcement Decree):

- If the price of emission permits is, for six consecutive months, at least three times higher than the average price for the immediately preceding two years;
- If the average trading volume in the previous month is at least twice as high as the monthly average trading volume in the same month in the immediately preceding two years, and the average emission permit price in the previous month is at least twice as high as the average price in the immediately preceding two years;
- If the average price of emission permits in the previous month does not exceed 70% of the average price in the immediately preceding two years;
- If the trading of emission permits between covered entities is impracticable because the supply of emission permits tradable in the market is significantly short of the amount demanded due to reasons such as covered entities' not trading emission permits in their possession.

- 2) This reserve is utilized by market makers, such as public financial institutions, to revitalize the emissions trading market (Art. 18, subpara. 2 and Art. 22–2 of the Act).
- 3) This reserve is utilized for the additional allocation of emission permits in the case of increased GHG emissions due to the opening of new business establishments, the establishment or expansion of facilities within a business establishment, a covered entity's compliance with its obligations under other laws,* or the covered entity's engagement in activities contributing to the achievement of the NDC** (Art. 16(1) of the Act); for the allocation of emission permits to new entrants that are newly designated as covered entities during a phase (Art. 30, subpara. 1 of the Enforcement Decree); and for the processing of objections to pre-allocation, additional allocation, and the revocation of emission permits (Art. 18, subpara. 4 of the Act).
 - *Constrained-on generation under Article 45(2) of the Electric Utility Act, observance of the obligation to supply integrated energy under Article 16(1) of the Integrated Energy Supply Act, additional flight operations to observe the flight technology standards under Article 77 of the Aviation Safety Act, and facility construction to comply with stronger effluent water quality standards under Article 7 of the Sewerage Act.
 - **Observance of measures implemented for the expansion of public transportation and transport of large and heavy cargo, and the use of combustible waste instead of fossil fuel.
- 4) In principle, the cap is established for each sector but, in the power sector, sub-sector-specific (power in general, other power-related, and integrated energy supply(industrial)) caps were established as an exception for some sub-sectors/entities/business establishments* with different GHG emission characteristics.
 - *Entities belonging to the "electric power generation, transmission, and distribution" (KSIC Code: 351) that mainly use hydropower or nuclear power for power generation, or whose main business is power transmission/substation/distribution, or natural gas terminals; entities belonging to the "manufacture of gas and distribution of gaseous fuel through the mains" (KSIC Code: 352); and entities engaged in integrated energy supply (industrial/residential) belonging to the "steam, chilled, or hot water and air conditioning supply" (KSIC Code: 353).

* Source : Amended Allocation Plan for Phase III (2021–2025) (December 2024)

With the finalization of the First National Master Plan for Carbon Neutrality and Green Growth (April 2023), which contains the sectoral and annual emissions reduction roadmap aimed at achieving the updated NDC, the government reviewed measures to adjust the cap so that it aligns with the updated NDC and the roadmap. According to the new reduction roadmap, the required adjustment amount for the cap was 12.7 Mt and, because there was a surplus in the reserve for other purposes, the government decided to use the reserve to adjust the cap and ensure its consistency with the updated NDC.

2.2. Revitalization of the Emissions Trading Market

With the amendment to the Act and its Enforcement Decree and relevant guidelines in February 2025, institutional improvements were made including the establishment of the standards for voluntary participation in the K-ETS, the differentiation of the standards for the revocation of emission permit allocation, the revision of the standards for the banking of emission permits, the expansion of market participants, and the establishment of a foundation for consignment trading.

2.2.1. Voluntary Participation in the K-ETS

Under the K-ETS, entities whose annual average amount of GHG emissions produced during the immediately preceding three years is no less than 125,000 t CO₂eq or entities with at least one business establishment whose annual average amount of GHG emissions produced during the immediately preceding three years is no less than 25,000 t CO₂eq are designated as covered entities. In addition, entities without a legal obligation may also be designated as covered entities following voluntary registration.

To expand the range of participation in the K-ETS and to establish a basis for providing incentives for non-covered entities, the government amended the Enforcement Decree to specify the standards for voluntary participation in the K-ETS.

〈Table 1-5〉 Changes in the Standards for Voluntary Participation

Current Provisions	Draft Amendment
[Standards for Voluntary Participation] (Art. 8 of the Act and Art. 9 of the Enforcement Decree)	
Entities subject to the GHG and Energy Target Management System that have submitted an emissions report at least once	Entities with verified emissions, whose annual average amount of GHG emissions produced during the immediately preceding three years is no less than 3,000 tCO ₂ eq

* Enforcement Decree of the Act on the Allocation and Trading of Greenhouse-Gas Emission Permits (Ministry of Environment, Office for Government Policy Coordination, and Ministry of Economy and Finance; partially amended on 7 February 2025)

2.2.2. Differentiation of the Standards for the Revocation of Allocation and the Additional Allocation of Emission Permits

Revocation of emission permit allocation was introduced to allow the government to revoke emission allowances allocated in the event the amount of GHG emissions from a covered entity's business establishment decreased by more than a certain extent due to the discontinuance or suspension of operation or closure of its facilities. Initially, revocation was permissible when the amount of GHG emissions from a covered entity's business establishment decreased to 50% or less of the amount of allocated emission allowances. However, because companies were able to enjoy unintended windfall profits due to reductions in emissions without corresponding reduction efforts, the government strengthened the standards for allocation revocation to address this issue and to encourage genuine emission reduction efforts by companies. In addition, the system was revised to allow for the differentiation of additional allocations based on the actual emissions from facilities within the business establishments of covered entities, a mechanism identical to the one utilized to determine the amount of allocated emission allowances the government may revoke.

〈Table 1 -6〉 Differentiation of the Standards for the Revocation of Allocation and the Additional Allocation of Emission Permits

Current Provisions	Draft Amendment
[Allocation Revocation]	
Allocation may be revoked when the amount of GHG emissions from a covered entity's business establishment decreases to 50% or less of the amount of allocated emission allowances	% decrease in actual emissions compared to the amount of emission allowances allocated per business establishment for the compliance year - 0-15%: No revocation - 15-25%: 50% of the shortfall between the allocated amount and actual emissions - 25-50%: 75% of the shortfall between the allocated amount and actual emissions - 50-100%: 100% of the shortfall between the allocated amount and actual emissions
[Additional Allocation]	
Newly included	% increase in actual emissions compared to the amount of emission allowances allocated per business establishment for the compliance year - 0-15%: No correction factor applies - 15-25%: 50% of the amount exceeding the allocated allowances - 25-50%: 75% of the amount exceeding the allocated allowances - 50-100%: 100% of the amount exceeding the allocated allowances

* Enforcement Decree of the Act on the Allocation and Trading of Greenhouse-Gas Emission Permits (Ministry of Environment, Office for Government Policy Coordination, and Ministry of Economy and Finance; partially amended on 7 February 2025)

2.2.3. Revision of the Standards for the Banking of Emission Permits

Restrictions on the banking of allowances were introduced to address liquidity shortages in the market and to promote market stability. Since their initial implementation, these restrictions have been progressively tightened. However, as banking restrictions emerged as a factor contributing to increased price volatility in the emissions trading market, the government took steps to alleviate supply-demand imbalances and enhance compliance flexibility for regulated entities. As a result, the banking standards were eased on two occasions through amendments to the Allocation Plan for the 3rd Phase (2021–2025) of the K-ETS: once in December 2023 and again in December 2024.

〈Table I -7〉 Revision of the Standards for the Banking of KAU·KCU23–25

3 rd Allocation Plan (Sep. 2020)	1 st Amended (Dec. 2023)	2 nd Amended (Dec. 2024)
[Net Sellers]		
KAU23, KCU23 net sales × 1	KAU23, KCU23 net sales × 3	KAU23, KCU23 net sales × 3
KAU24, KCU24 net sales × 1	KAU24, KCU24 net sales × 3	KAU24, KCU25 net sales × 5
KAU25, KCU25 average annual net sales for Phase III × 1	KAU25, KCU25 net sales × 3	KAU25, KCU25 net sales × 5

* Source: Amended Allocation Plan for Phase III (2021~2025) (Ministry of Environment, December 2023)

Source: Amended Allocation Plan for Phase III (2021~2025) (Ministry of Environment, December 2024)

2.2.4. Expansion of Market Participants and Establishment of a Foundation for Consignment Trading

In accordance with Article 22-2 of the Act, the government introduced the market-making system in Phase II to revitalize emissions trading and ensure the stable operation of the emissions trading market. Under this system, market makers are obligated to engage in emissions trading in the exchange market using emission permits they borrow from the government, which lends emission permits from the reserve for market-making for the respective compliance year. In the 2023 compliance year, one additional financial institution was designated as a market maker, and accordingly, a total of eight market makers are currently participating in the emissions trading market. The maximum amount of emission permits made available for market makers has continuously increased, reaching 6 Mt.

One of the most significant changes in the K-ETS during Phase III has been the introduction of third-party trading. To ensure the transparency and revitalization of the emissions trading market and stabilize emission permit prices, the government introduced proprietary trading by securities companies in September 2021. As of the 2023 compliance year, 21 securities companies participated in the exchange market, the same number as in the previous year. The amount of emission permits each securities company may hold has continuously increased since the launch of the system, and today, each securities company may hold a maximum of 1 Mt.⁸⁾

In addition, the government has improved the existing trading method in which market participants directly traded emission permits through the emission permit exchange after registering as members to expand the scope of market participants. As a result, the range of market participants, which had previously been limited to covered entities, market makers, and securities companies, has been broadened, and the trading methods have been diversified to include consignment trading through emissions trade brokerage companies. Accordingly, a foundation has been established for the institutionalization of brokerage-based emission permit transactions and the revitalization of the emissions trading market.

8) Enforcement Rules for the Regulations on the Emissions Trading Market Operation (amended on 27 Jun. 2023).

〈Table Ⅰ -8〉 Expansion of Market Participants and Changes in the Trading Method

Current Provisions	Draft Amendment
[Eligible Market Participants]	
Covered entities Market makers Emissions trade brokerage companies	Covered entities Market makers Emissions trade brokerage companies Collective investment entities (asset management companies) Fund managers Banks, insurance companies, etc.
[Emissions Trading Methods]	
Direct trading through the emission permit exchange	Direct trading through the emission permit exchange Brokerage-based trading through emissions trade brokerage companies

1) Act on the Allocation and Trading of Greenhouse-Gas Emission Permits (Ministry of Environment, Office for Government Policy Coordination, and Ministry of Economy and Finance; partially amended on 7 February 2025)
2) Enforcement Decree of the Act on the Allocation and Trading of Greenhouse-Gas Emission Permits (Ministry of Environment, Office for Government Policy Coordination, and Ministry of Economy and Finance; partially amended on 7 February 2025)

2024

KOREAN EMISSIONS TRADING SYSTEM REPORT

II

K-ETS Operational Results

1. Allocation of Emission Permits
2. Certification and Surrender of Emissions Permits

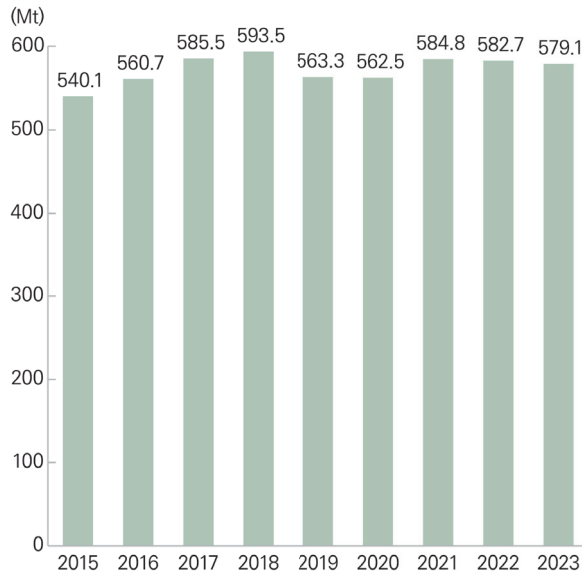
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Allocation of Emission Permits

When entities designated as covered entities submit their allocation application to the government four months prior to the commencement of a phase, the government issues a notification of the allocated amount, which is referred to as the pre-allocation amount. From 2021, with the commencement of Phase III, the share of allowances allocated through actioning was raised, with 10% of the total allocation for covered entities that are eligible for auctions deducted and set aside for purchase through auctions in the emissions trading market.

In the 2023 compliance year, the emission permits set for pre-allocation amounted to 567.4 Mt, while the final allocation amount, which reflected a number of changes that occurred during the compliance year (e.g., additional allocation, allocation revocation, and the succession of rights and obligations), was 579.1 Mt (735 entities). In 2021, which was the first compliance year of Phase III, the final allocation amount increased by 4.0% compared to the previous year due to the expansion of covered entities and emission activities subject to management under the K-ETS. The final allocation amount for the 2022 compliance year decreased by 0.4% compared to the previous year due to an increase in the amount of emission permits whose allocation was revoked, which led to a decrease in the amount of allocation changes. The final allocation for the 2023 compliance year decreased by 0.6% compared to the previous year, which was due to a reduction in the total volume of valid bids, which in turn led to a decrease in allocation changes after the pre-allocation of emission allowances.

〈Figure II-1〉 Final Allocation by Compliance Year



〈Table II-1〉 Final Allocation and Entities by Compliance Year

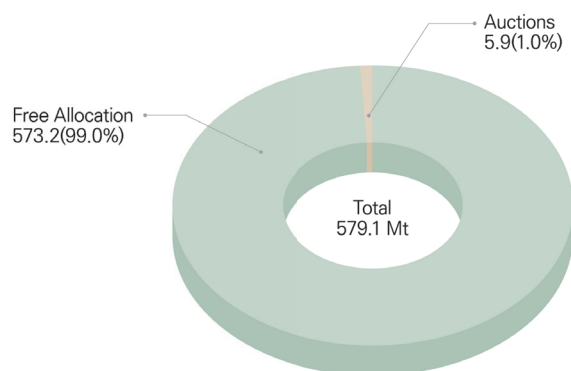
(Unit : Mt)

Phase	Year	Final allocation	Annual change	Entities
I	2015	540.1	–	522
	2016	560.7	3.8%	564
	2017	585.5	4.4%	592
II	2018	593.5	1.4%	587
	2019	563.3	–5.1%	611
	2020	562.5	–0.2%	637
III	2021	584.8	4.0%	687
	2022	582.7	–0.4%	714
	2023	579.1	–0.6%	735

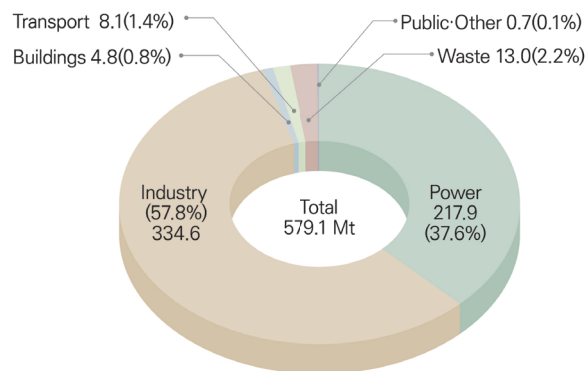
* (Source) ETRS Database (as of Sep. 2024)

For the 2023 compliance year, as in the previous year, 567.4 Mt of emission allowances were originally pre-allocated to 684 entities, but the number of entities increased to 735 due to new entries and the succession of rights and obligations between existing covered entities (some businesses that took over the rights and obligations of existing covered entities as a result of, for example, the splitting of covered entities, were newly designated as covered entities). Broken down by sector, the final allocation was 334.6 Mt for industry (57.8%), 217.9 Mt for power (37.6%), 13.0 Mt for waste (2.2%), 8.1 Mt for transport (1.4%), 4.8 Mt for buildings (0.8%), and 0.7 Mt for public services/other (0.1%).

The difference between the final allocation and pre-allocation amount was higher for the buildings and waste sectors (8.1% and 8.4%, respectively) than for other sectors (4.5% for transport, 2.0% for industry, 1.7% for power, and 0.6% for public services/other). The legal grounds for the allocation changes are outlined in 〈Table II-3〉.



〈Figure II-2〉 Free Allocation and Auctions in the 2023 Compliance Year



〈Figure II-3〉 Final Allocation by Sector in the 2023 Compliance Year

〈Table II-2〉 Difference between Pre-allocation and Final Allocation for the 2023 Compliance Year

(Unit : Mt)

Sector	Pre-allocation	Final allocation	Change
Total	567.4	579.1	2.1%
Power	214.4	217.9	1.7%
Industry	328.2	334.6	2.0%
Buildings	4.4	4.8	8.1%
Transport	7.7	8.1	4.5%
Waste	12.0	13.0	8.4%
Public/Other	0.689	0.693	0.6%

1.1. Designation of Covered Entities

According to Article 8 of the Act, entities whose annual average amount of GHG emissions produced during the immediately preceding three years is no less than 125,000 t CO₂eq or entities with at least one business establishment whose annual average amount of GHG emissions produced during the immediately preceding three years is no less than 25,000 t CO₂eq are designated as covered entities. The number of covered entities for Phases I–III is presented in <Table II–4>.

The government must, pursuant to Article 8 of the Act, designate covered entities no later than five months prior to the commencement of each phase. In addition, the government designates entities that fall under the application of Article 8 during a phase as a result of the establishment, alteration, or expansion of their facilities as “new entrants,” evaluates their application for emission permit allocation, and notifies them of their pre-allocated amount.

The number of covered entities for each phase or compliance year may change when new covered entities are designated or designations are canceled following new entries, allocation revocation, or the succession of rights and obligations. In the 2023 compliance year, the number of entities subject to the pre-allocation of emission permits was 684, while the number of covered entities subject to final allocation was 735.

〈Table II-3〉 Number of Covered Entities under the K-ETS

Phase	Compliance year	Pre-allocation	New entry	Additional allocation	Allocation revocation	Succession of Rights and Obligations		Re-allocation ¹⁾	Free allocation	Auction ²⁾	Final allocation	Certified emissions ³⁾
						Transfer	Acquisition					
I	2015	525	–	63	211	23	24	–	522	–	522	522
	2016	525	44	161	249	35	36	–	564	–	564	560
	2017	525	78	337	269	56	54	434	592	–	592	591
II	2018	591	–	242	224	17	19	–	587	116	587	586
	2019	587	18	266	250	39	46	–	611	125	611	610
	2020	604	21	232	300	64	72	–	637	136	637	636
III	2021	684	–	220	166	33	34	–	687	192	687	687
	2022	684	22	253	225	52	54	–	714	204	714	713
	2023	684	45	283	251	78	85	–	735	257	735	733

1) Considering the reduction targets for 2030 and the means of reduction presented in the Basic Roadmap for Achieving 2030 National GHG Reduction Targets established in December 2016, the total emissions allowances were recalculated and reallocated for the 2017 compliance year

(Source: the draft amendment to the Allocation Plan for the Third Compliance Year of Phase I (January 2017))

2) Number of covered entities from sub-sectors eligible for auctions

3) Number of entities holding the obligation to surrender emission permits, excluding entities that merged due to the transfer of rights and obligations

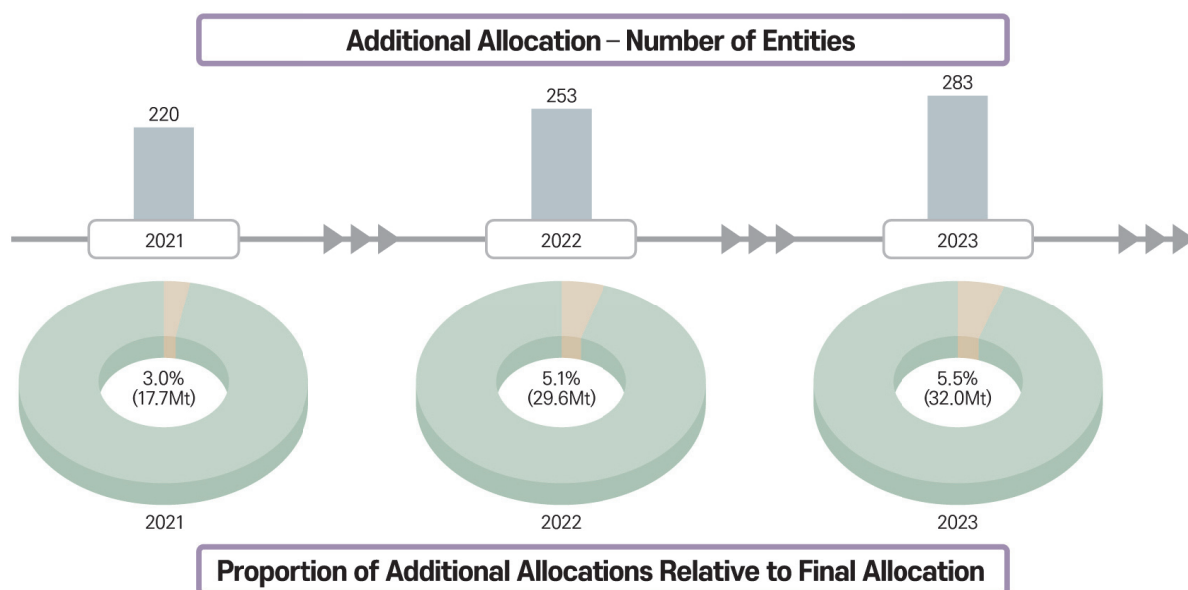
1.2. Additional Allocation

According to Article 16 of the Act, in the event that the amount of GHG emissions increases in a compliance year for reasons such as the opening of a business establishment or the establishment or expansion of facilities within a business establishment, or in the event the amount of GHG emissions of a covered entity increases due to the covered entity's compliance with obligations under other laws or engagement in activities contributing to the achievement of national GHG reduction targets during a phase, the government may additionally allocate emission allowances to the covered entity.

In the 2023 compliance year, additional allocation amounting to 32.0 Mt was approved for 283 covered entities. Over the past three years, the proportion of additional allocation in relation to the final allocation has increased (Figure II-4). In the 2021 compliance year, the proportion was approximately 3.0%. It increased by 2.1%p in the 2022 compliance year and 0.4%p in the 2023 compliance year compared to the previous years. The two main reasons for this increase in additional allocation appear to be (i) the significant increase in additional allocation in the power and industry sectors compared to the previous year for reasons such as constrained-on generation and new facility construction, and (ii) the expansion of additional allocation for high GHG efficiency facilities following the adoption of the improvement plan for the K-ETS (November 2022).⁹⁾

The reasons for the covered entities applying for additional allocation were similar to those given in other compliance years, which included the establishment of new facilities (45.9%), the expansion of facilities (38.7%), an increase in the amount of constrained-on generation due to the unexpected operation of the power system (5.8%), observance of the obligation to supply integrated energy (4.4%), and the use of combustible waste (3.7%). Other reasons included additional flight operations to ensure aviation safety, construction to improve public sewage treatment facilities, and expansion of public transportation services.

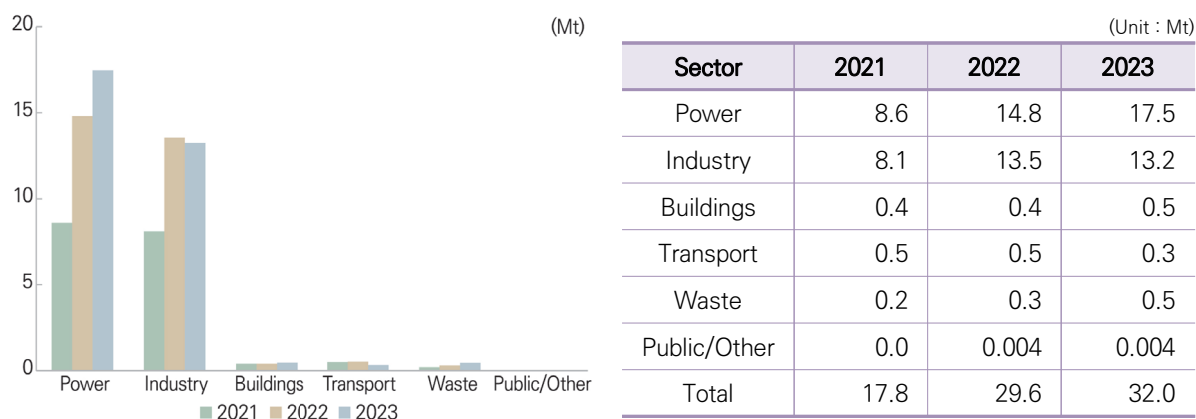
⁹⁾ Emissions increased because of an increase in additional allocation for covered entities that have improved their emission efficiency by building or expanding more efficient facilities emitting less GHGs (with the best available techniques, top 10% in emission efficiency) or replacing old equipment.



〈Figure II-4〉 Additional Allocation and the Number of Entities Subject to Additional Allocation in the 2021–2023 Compliance Years

In the power sector, additional allocation increased by 72.1% compared to the previous year in 2022 and by a further 18.1% in 2023, with 25 entities receiving an additional allocation of 17.5 Mt of emission permits. In the industry sector, additional allocation increased by 66.7% compared to the previous year in 2022 but decreased by 2.2% compared to the previous year in 2023, with 167 entities receiving an additional allocation of 13.2 Mt of emission permits for reasons such as the establishment or expansion of new facilities.

〈Figure II-5〉, 〈Table II-4〉 Additional Allocation in the 2021–2023 Compliance Years by Sector



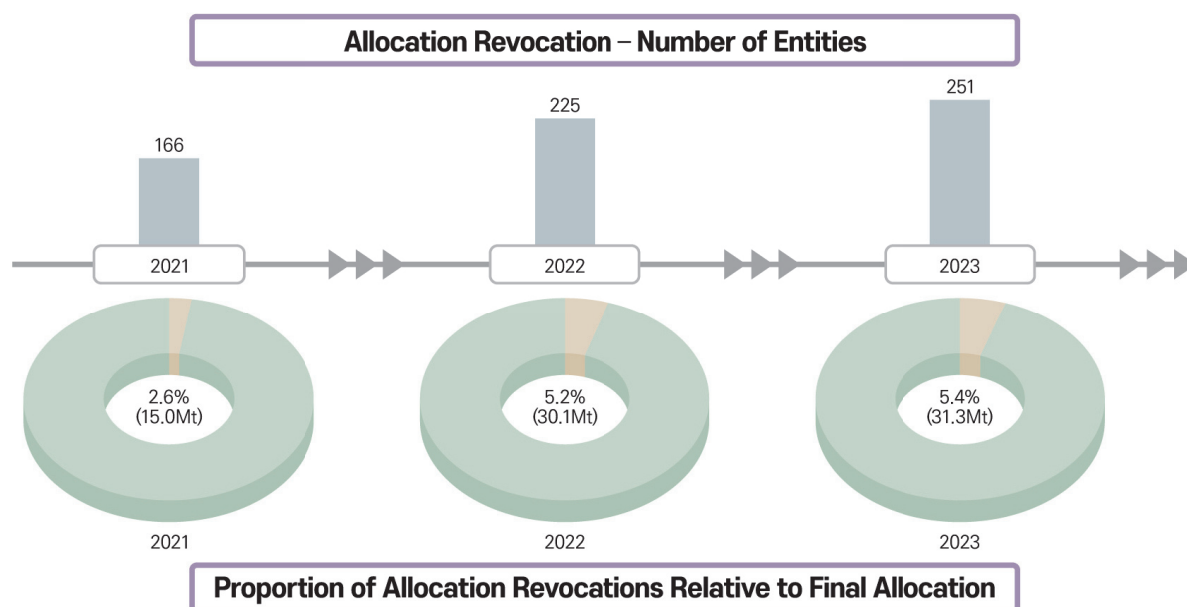
1.3. Allocation Revocation

According to Article 17 of the Act, in the event of a covered entity closing all or part of its business establishments, the amount of GHG emissions from the facilities of a covered entity's business establishment decreasing by more than a certain extent due to the suspension of their operation, or the discovery that emission allowances were applied for or allocated or additionally applied for or additionally allocated based on false information, the government may revoke all or part of the emission allowances allocated or additionally allocated free-of-charge for the covered entity.

In the 2023 compliance year, a total of 31.3 Mt of allocations was revoked for 251 entities. These revoked allocations accounted for approximately 5.4% of the final allocation and were 0.7 Mt lower than the amount additionally allocated. The most common reasons for allocation revocation were the closure of all or part of their business establishments and the amount of the covered entity's GHG emissions in the compliance year being less than 50% of the allocated emission allowances.

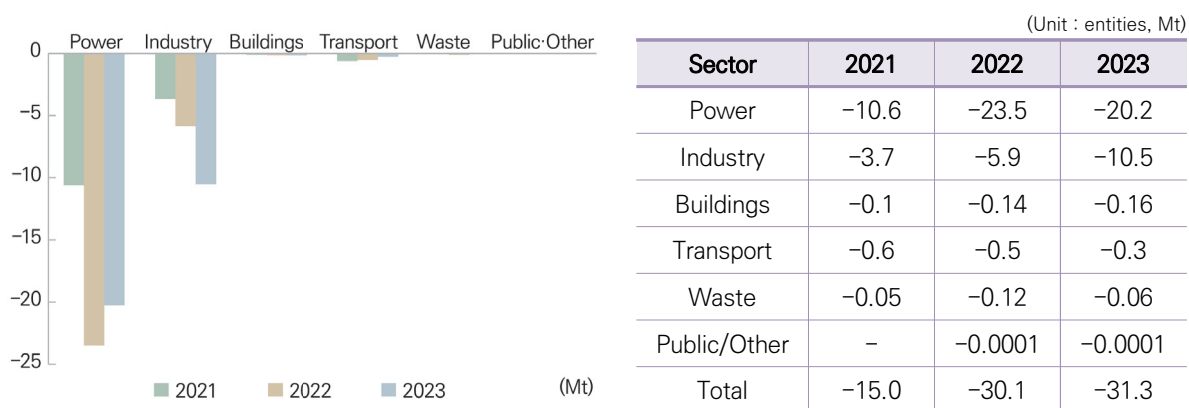
Broken down by sector, revoked emission permits amounted to 20.2 Mt for power (64.8%), 10.5 Mt for industry (33.6%), 0.3 Mt for transport (0.9%), 0.16 Mt for buildings (0.5%), 0.06 Mt for waste (0.2%), and 0.0001 Mt for public services/other (0.0%), meaning that the power and industry sectors experienced the highest allocation revocation. In the public services/other sector, 53 t of allocated emission permits were revoked for one entity.

The amount of revoked allocations for the power sector increased by 3.3 Mt (13.8%) compared to the previous year. The reasons for this increase included temporary and intermittent suspension of facility operations in business establishments. In the industry sector, the amount of revoked allocations for the entire sector increased by 4.6 Mt (79.3%) compared to the 2022 compliance year. This increase was led mainly by the semiconductor, oil refining, petrochemicals, and steel sub-sectors.



〈Figure II-6〉 Allocation Revocation and the Number of Entities Subject to Allocation Revocation in the 2021–2023 Compliance Years

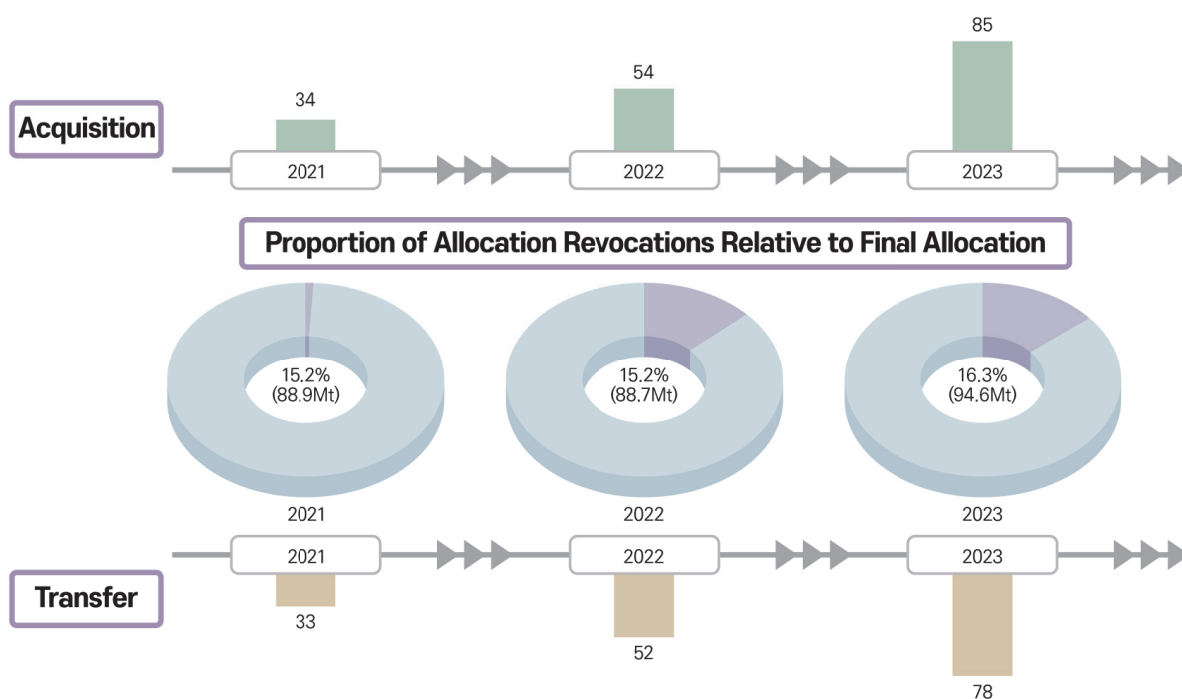
〈Figure II-7〉, 〈Table II-5〉 Allocation Revocation in the 2021–2023 Compliance Years by Sector



1.4. Succession of Rights and Obligations

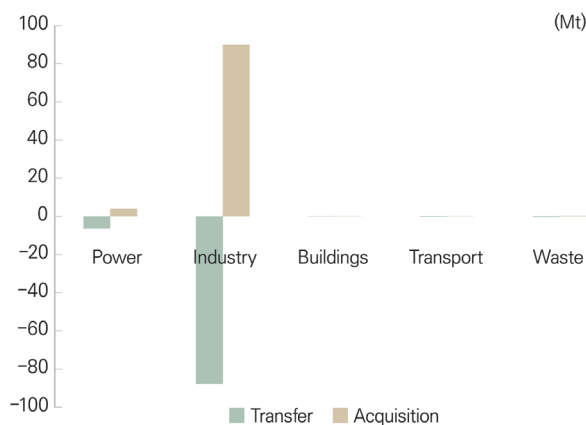
According to Article 8-2 of the Act and Article 11 of the Enforcement Decree, in the event of a covered entity merging with another entity or splitting, transferring, or leasing part of its business establishment or facilities to another entity, the rights and obligations of the covered entity are transferred. If the entity that succeeds the rights and obligations from a covered entity is not a covered entity, it will be deemed as having been designated as one at the time the rights and obligations were handed over.

In the 2023 compliance year, a total of 78 covered entities (5 entities from the power sector, 57 entities from industry, 3 entities from buildings, 10 entities from transport, and 3 entities from waste) transferred 94.6 Mt of KAU23, and, as a result, a total of 85 covered entities (4 entities from the power sector, 63 entities from industry, 4 entities from buildings, 11 entities from transport, and 3 entities from waste) took over the rights and obligations. Emission permits transferred as a result of the succession of rights and obligations for the industry and power sectors accounted for 92.8% and 6.7%, respectively. Similar to the previous year, a vast majority of successions occurred in the industry sector, and the amount of emission permits transferred reached a record high. This was due to the transfer of a large amount of KAUs via mergers between the affiliates of covered entities and the splitting and establishment of covered entities.



〈Figure II-8〉 Proportion of Emission Permits Transferred as a Result of the Succession of Rights and Obligations and the Number of Relevant Entities in the 2021-2023 Compliance Years

〈Figure II-9〉 2023 Succession of Rights and Obligations by Sector



〈Table II-6〉 2023 Succession of Rights and Obligations and the Number of Relevant Entities by Sector

(Unit : entities, Mt)

Sector	Transfer		Acquisition	
	No. of Entities	No. of Emission Permits	No. of Entities	No. of Emission Permits
Power	5	-6.3	4	4.1
Industry	57	-87.8	63	90.0
Buildings	3	-0.003	4	0.005
Transport	10	-0.2	11	0.2
Waste	3	-0.3	3	0.3
Total	78	-94.6	85	94.6

1.5. Final Allocation

1.5.1. Free Allocation

The sub-sectors subject to free allocation in Phase III were determined by categorizing them based on the groups listed under the Korea Standard Industrial Classification (KSIC) and selecting entities from these sub-sectors whose production cost incurrence rate¹⁰⁾ multiplied by their trade intensity¹¹⁾ was no less than 0.002 (0.2%). In Phase III, 28 of 69 sub-sectors were designated as sub-sectors subject to free allocation.

The amount of free allocation is calculated by first determining the pre-allocation amount and then reflecting changes (e.g., new entries, additional allocation, allocation revocation, the succession of rights and obligations) in the allocated amount for each covered entity that occur during the relevant compliance year.

The amount of free allocation in the 2023 compliance year was 573.2 Mt, including a pre-allocation amount of 567.4 Mt and allocation changes of 5.8 Mt. Allocation changes were the result of the succession of rights and obligations (94.6 Mt, transferred by 78 entities and acquired by 85 entities), additional allocation (32.0 Mt, 283 entities), and allocation revocation (31.3 Mt, 251 entities).¹²⁾ Broken down by sector, the amount for free allocation was 334.6 Mt for industry, 212.1 Mt for power, 13.0 Mt for waste, 8.1 Mt for transport, 4.8 Mt for buildings, and 0.7 Mt for public services/other.

10) $[\text{Annual average GHG emissions from the relevant sub-sector for the base period (tCO}_2\text{eq/year)} \times \text{average market price for emission permits for the base period (won/tCO}_2\text{eq)}] / \text{annual average value-added production volume of the relevant sub-sector for the base period (won/year)}$.

11) $[\text{Annual average exports of the relevant sub-sector for the base period (won/year)} + \text{annual average imports of the relevant sub-sector for the base period (won/year)}] / [\text{annual average sales of the relevant sub-sector for the base period (won/year)} + \text{annual average imports of the relevant sub-sector for the base period (won/year)}]$.

12) Discrepancies may arise between the amount of allocated emission allowances and the amount of certified emissions due to subsequent occurrences such as allocation revocations resulting from administrative dispositions.

1.5.2. Auctions

In accordance with the Allocation Plan for Phase III, covered entities¹³⁾ from a total of 41 sub-sectors were categorized as covered entities subject to auctions, and 10% of the Total Emission Allowances (82.0 Mt) were deducted for these auctions. Subsequently, 5.4 Mt of emission allowances¹⁴⁾ were added after reflecting factors such as additional allocations and allocation revocations. In turn, a total of 87.4 Mt of emission allowances were transferred to the auction account¹⁵⁾ for Phase III.

Starting in 2024, the government revised its approach to auctioning allowances by conducting auctions on a flexible monthly basis, taking market conditions into account. Prior to each auction, the volume of allowances to be auctioned was announced through a public bidding notice. For compliance year 2023, a total of 17.8 Mt of allowances were planned for auctioning. The first auction for KAU23 took place in July 2023. A total of 11 auctions were conducted, as no auction was held in April 2024 pursuant to Article 7 of the Regulations for the Additional Allocation of Emission Permits for Auctions and Market Stabilization Measures. The bidding dates and sizes of bids are presented in <Table II-8>. Emission allowances not sold at an auction may be added to the subsequent auction as remaining allowances.¹⁶⁾ The total amount of emission allowances auctioned in the 2023 compliance year was 5.9 Mt (15 entities), which accounted for 1.0% of the final allocation amount (579.1 Mt)¹⁷⁾.

13) For the 2023 compliance year, a total of 257 covered entities were selected for auctions, including 65 entities from the power sector, 143 entities from industry, 20 entities from buildings, 26 entities from transport, 1 entity from waste, and 2 entities from public services/other.

14) With respect to those covered entities belonging to the sub-sectors subject to auctions, even in the case of additional allocation, 10% of the additionally allocated emission allowances are deducted and transferred to the auction account.

15) An auction account registered in the Emissions Trading Registry in accordance with the Notification on GHG Emission Permits Trading (Ministry of Environment, partially amended in 2018) is an emissions trading account specified in Article 32 of the Enforcement Decree and is used as an intermediary account until the auctioned emission permits are transferred to the relevant entity account pursuant to Article 12(3) of the Act.

16) If the total volume of valid bids is lower than the total volume of bids made at an auction, the amount of remaining bids may be added to the subsequent auction (Art. 6 of the Regulations for the Additional Allocation of Emission Permits for Auctions and Market Stabilization Measures).

17) In terms of the revenue generated from the auctions, the total payments for emission permits, excluding transaction fees for the KRX, are returned to the government.

〈Table II-7〉 KAU23 Auction Volume

Year	Auction Date	Bid Size ¹⁾		Valid Bids	
		Implementation	Amount Registered	Size of Valid Bids	No. of Valid Bids
2023	12 Jul. (Wed)	2,150,000t	2,150,000t	795,000t	3
	9 Aug. (Wed)	2,150,000t	2,150,000t	798,000t	5
	3 Sep. (Wed)	3,070,000t	3,070,000t	942,000t	5
	11 Oct. (Wed)	3,070,000t	3,070,000t	946,200t	6
	8 Nov. (Wed)	3,070,000t	3,070,000t	1,166,500t	6
	13 Dec. (Wed)	3,090,000t	1,500,000t	454,000t	4
2024	10 Jan. (Wed)	450,000t	450,000t	202,500t	3
	14 Feb. (Wed)	200,000t	200,000t	123,700t	6
	13 Mar. (Wed)	200,000t	200,000t	200,000t	4
	8 May. (Wed)	100,000t	100,000t	100,000t	4
	12 Jun. (Wed)	200,000t	200,000t	200,000t	4
Total	11 ²⁾	17,750,000t	16,160,000t	5,927,900t	50

1) Notice on the 2023 Auction Plan for Emission Allowances (Ministry of Environment Notice No. 2022-714, 16 December 2022), Revised Notice on the 2023 Auction Plan for Emission Allowances (Ministry of Environment Notice No. 2023-284, 26 April 2023), Notice on the 2024 Auction Plan for Emission Allowances (Ministry of Environment Notice No. 2024-11, 3 January 2024), and Revised Notice on the 2024 Auction Plan for Emission Allowances (Ministry of Environment Notice No. 2024-157, 6 March 2024)

2) Auction adjustment pursuant to Article 7 of Regulations for the Additional allocation of emission permits for auctions and market stabilization measures (April 2024)

1.5.3. Final Allocation

Information on the sector-specific final allocation of emission allowances for the 2023 compliance year is provided in <Table II-9>. The final allocation amount (579.1 Mt) consisted of 573.2 Mt of free allocation (99.0%) and 5.9 Mt of auctioned allowances (1.0%). The amount provided for free allocation included a pre-allocation amount of 567.4 Mt (99.0%) and allocation changes of 5.8 Mt (1.0%), which resulted from additional allocation, allocation revocation, and the succession of rights and obligations.

The overall rate of change between the pre-allocation and final allocation amount for all covered entities was 2.1%. Broken down by sector, the rate of change was 8.1% for buildings, 8.4% for waste, 4.5% for transport, 2.0% for industry, 1.7% for power, and 0.6% for public services/other.

<Table II-8> Final Allocation by Sector for the 2023 Compliance Year

(Unit: Mt, entities)

Sector	Final allocation(E=C+D)									Change (E-A)/A	
	Free allocation(C=A+B)							Auctions (D)			
	Pre- allocation (A)	Allocation changes (B)									
		New entry	Additional	Revocation	Succession of Rights & Obligations						
					Transfer	Acquisition					
Power	217.9	212.1	214.4	-2.3	2.7	17.5	-20.2	-6.3	4.1	5.9	1.7%
Industry	334.6	334.6	328.2	6.4	1.4	13.2	-10.5	-87.8	90.0	0.03	2.0%
Buildings	4.8	4.8	4.4	0.3	0.03	0.5	-0.2	-0.003	0.005	0.02	8.1%
Transport	8.1	8.1	7.7	0.4	0.3	0.3	-0.3	-0.2	0.2	-	4.5%
Waste	13.0	13.0	12.0	1.0	0.6	0.5	-0.1	-0.3	0.3	-	8.4%
Public /Other	0.7	0.7	0.7	0.004	-	0.004	-0.0001	-	-	-	0.6%
Total	579.1	573.2	567.4	5.8	5.1	32.0	-31.3	-94.6	94.6	5.9	2.10%
Entities	735	735	684	742	45	283	251	78	85	15	7.5%

1) Pre-allocation allowances were allocated to 684 covered entities, but the number of covered entities at the time of final allocation increased to 735 due to changes (e.g., allocation revocation, succession of rights and obligations) that occurred during the compliance year (Source: ETRS Database, as of September 2024)

2) Discrepancies may arise between the amount of allocated emission allowances and the amount of certified emissions due to the rounding of decimal places during data aggregation and subsequent occurrences such as allocation revocations resulting from administrative dispositions.

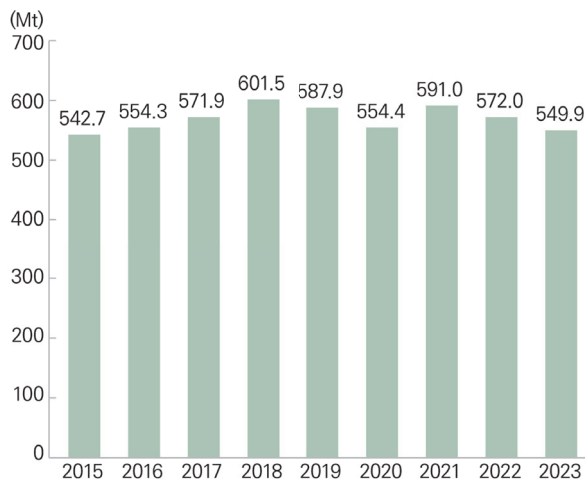
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Certification and Surrender of Emission Permits

2.1. Certification of Emissions

According to the results of the government's verification of emissions reports submitted by 735 entities to which emission permits were finally allocated in the 2023 compliance year, the certified emissions amounted to 549.9 Mt, which was 3.9% (21.1 Mt) lower than the previous year. This decrease was a result of a reduction in certified emissions compared to the previous year in the power and industry sectors.

〈Figure II-10〉 Certified Emissions by Compliance Year



〈Table II-9〉 Certified Emissions and Entities by Compliance Year

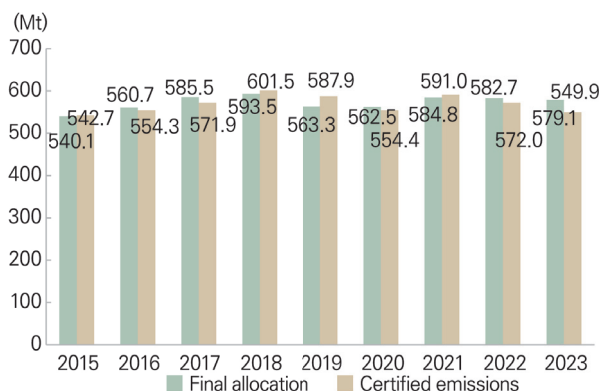
(Unit: Mt, entities)

Phase	Year	Certified emissions	Annual change	No. of Entities
I	2015	542.7	–	522
	2016	554.3	2.2%	560
	2017	571.9	3.2%	591
II	2018	601.5	5.2%	586
	2019	587.9	–2.3%	610
	2020	554.4	–5.7%	636
III	2021	591.0	6.6%	687
	2022	572.0	–3.2%	713
	2023	549.9	–3.9%	733

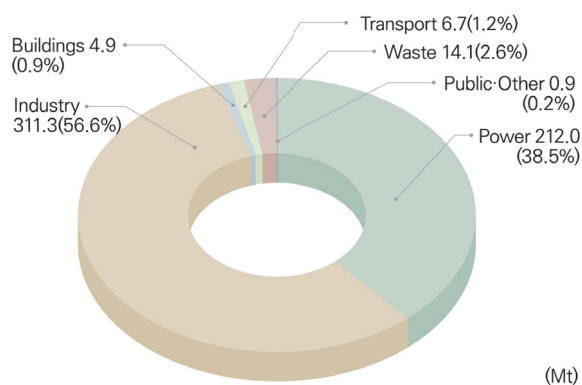
(Source) ETRS Database (as of Sep. 2024)

〈Figure II-10〉 shows the results of the comparison between the final allocation amount and the amount of certified emissions for each compliance year. In the 2023 compliance year, the certified emissions fell short of the final allocation by 29.2 Mt. This was due to an increase in carbon-free power generation, influenced by the government's energy policies, and a reduction in production caused by a slowdown in GHG-intensive industries.

Broken down by sector, the amount of certified emissions for the 2023 compliance year from the industry sector was 311.3 Mt (56.6%), compared to 212.0 Mt (38.5%) from the power sector, 14.1 Mt (2.6%) from waste, 6.7 Mt (1.2%) from transport, 4.9 Mt (0.9%) from buildings, and 0.9 Mt (0.2%) from public services/other.



〈Figure II-11〉 Final Allocation and Certified Emissions by Compliance Year



〈Figure II-12〉 Certified Emissions by Sector in the 2023 Compliance Year

2.2. Surrender of Emission Permits

Covered entities must surrender emission permits to the government in an amount equivalent to the amount of certified emissions within eight months from the date of completion of each compliance year. Emission permits can be surrendered using the KAUs allocated for the relevant compliance year, KCUs converted from KOCs, and other permits either banked from the previous compliance year (KAUs and KCUs) or borrowed from the next compliance year (KAUs). These surrender methods ensure flexibility so that covered entities can surrender emission permits through various methods other than emissions trading. In addition, the government has introduced market-maker trading and proprietary trading by securities companies to ensure the liquidity of the emissions trading market. Consequently, covered entities are able to secure additional emission permits not only through exchange trading but also with OTC trading, including swap or repo trading.

For the 2023 compliance year, a total of 549.9 Mt of emissions produced by 733 entities was certified. Broken down by the type of emission permits surrendered, KAUs accounted for 548.9 Mt (99.8%) and KCUs for 1.1 Mt (0.2%), which indicates that most of the permits surrendered were KAUs. The amount of KCUs surrendered decreased by 6.5 Mt compared to the previous year. In addition, 39.3 Mt (509 entities) of the emission permits banked from the 2022 compliance year were used in the trading and surrender in the 2023 compliance year and, after their surrender, 70.0 Mt (540 entities) of the permits were carried over to the following compliance year. Additionally, 0.5 Mt (41 entities) of the permits borrowed from the 2024 compliance year were used for the surrender.

In the 2023 compliance year, a total of 733 entities surrendered emission permits due to the succession of rights and obligations. Surplus emission permits for nine entities amounting to 5 kt (the amount not carried over¹⁸⁾) expired.

¹⁸⁾ The amount of emission permits not carried over to the next compliance year by covered entities after meeting their obligation to surrender or the amount remaining after the emission permits are carried over to the next compliance year to the fullest possible extent.

〈Table II-10〉 Surrender Results by Sector in the 2023 Compliance Year

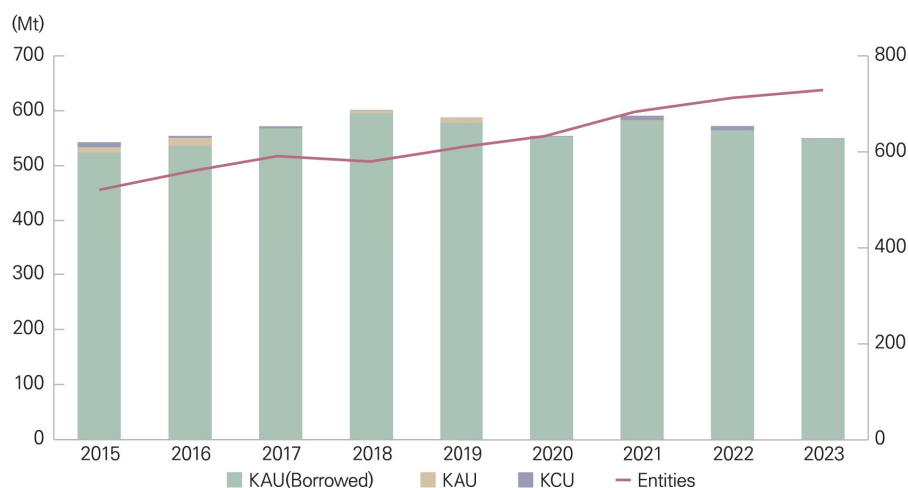
(Unit : Mt)

Sector	Certified		Banking (^{22→23})	Borrowing (^{23→22})	KOC → KCU	KAU Traded ¹⁾		Surrendered				Not Surrendered	Not Banked	Banking(^{23→24})		
	Emission	Entity				Sold	Purchased	Total	KAU	KAU (Borrowed)	KCU			Total	KAU	KCU
Power	212.0	60	4.8	0.4	0.6	-6.6	19.0	212.0	211.1	0.2	0.7	-	0.001	23.4	23.4	-
Industry	311.3	476	23.9	0.2	0.1	-17.2	6.6	311.3	310.6	0.3	0.3	-	0.0	36.9	36.8	0.1
Buildings	4.9	40	0.1	0.0002	-	-0.04	0.2	4.9	4.9	0.001	0.002	-	0.0	0.1	0.1	-
Transport	6.7	67	1.3	0.004	-	-1.3	0.1	6.7	6.7	0.02	-	-	0.0	1.6	1.6	-
Waste	14.1	88	0.4	0.02	0.04	-0.2	1.9	14.1	14.1	0.01	0.05	-	-	1.0	0.9	0.01
Public/Other	0.9	2	-	-	-	-	0.2	0.9	0.9	-	-	-	-	-	-	-
Market maker	-	-	6.3	-	-	-7.0	4.7	-	-	-	-	-	-	4.9	4.9	-
Securities	-	-	2.5	-	-	-0.7	0.3	-	-	-	-	-	-	2.1	2.1	-
Total	549.9	733	39.3	0.7	0.7	-33.1	33.1	549.9	548.4	0.5	1.1	-	0.0	70.0	69.9	0.1
Entities	733	733	509	38	11	491	292	733	733	41	21	-	9	544	540	4

1) The entries are based on the trading volume registered in the ETRS, which might be different from the trading volume specified under Part III (based on KRX data)

2) Market makers and securities companies are not counted as covered entities.

Source: ETRS Database (as of Sep. 2024)



〈Figure II-13〉 Surrendered Emission Permits by Compliance Year

2.3. Flexibility Mechanisms

Flexibility mechanisms are a means to ensure flexibility in the surrender of emission permits by covered entities that minimize the cost of reducing GHG emissions. These flexibility mechanisms allowed by the government for the surrender of emission permits include the use of KCUs obtained from the conversion of KOCs and the banking (KAUs and KCUs) and borrowing (KAUs) of emission permits.

2.3.1. Use of KOCs and KCUs

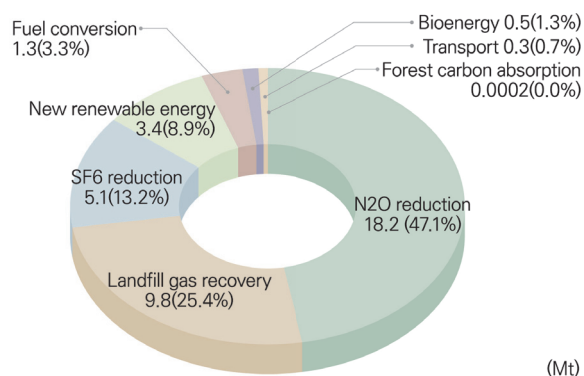
From 2015 to August 2024, a total of 52.0 Mt¹⁹⁾ of KOCs obtained from domestic (38.5 Mt, 74.1%) and overseas (13.5 Mt, 25.9%) external offset projects were registered. From September 2023 to August 2024, a total of 2.6 Mt of KOCs were registered, with 1.3 Mt from domestic and 1.3 Mt from overseas offset projects, which was significantly lower compared to the same period in the previous year (8.5 Mt). Both KOCs issued from domestic and overseas offset projects decreased. In particular, KOCs issued from overseas offset projects, which had continuously increased since their introduction in the 2020 compliance year (1.0 → 5.4 → 5.9 Mt), sharply declined beginning in the previous year.

A total of 1,432 projects were approved as external offset projects, of which 825 were domestic and 607 were overseas. In terms of domestic projects, the largest amount of certified reductions was achieved via projects related to technologies used to reduce N₂O emissions in the process of manufacturing petrochemical products, followed by those obtained from projects related to landfill gas recovery technologies (the waste sector), technologies used to reduce SF₆ emissions in the process of manufacturing semiconductors, and projects related to new renewable energy generation, such as tidal and wind power. In terms of overseas projects, certified reductions were achieved primarily from fuel conversion projects, including those related to the distribution of high-efficiency cookstoves, followed by those obtained from CH₄ leakage reduction projects focusing on the prevention of gas pipe leakages and projects related to new renewable energy generation, such as hydro and solar power.

¹⁹⁾ 52.0 Mt = 22.5 Mt from Phase I (1 Jan. 2015–9 Aug. 2018) + 10.3 Mt from Phase II (10 Aug. 2018–9 Aug. 2021) + 19.3 Mt from Phase III (10 Aug. 2021–31 Aug. 2024).

Project type	No. of Projects	Certified (Mt)
Total	825	38.5
N ₂ O reduction	183	18.2
Landfill gas recovery	72	9.8
SF ₆ reduction	49	5.1
New renewable energy	166	3.4
Fuel conversion	298	1.3
Bioenergy	52	0.5
Transport	4	0.3
Forest carbon absorption	1	0.0002

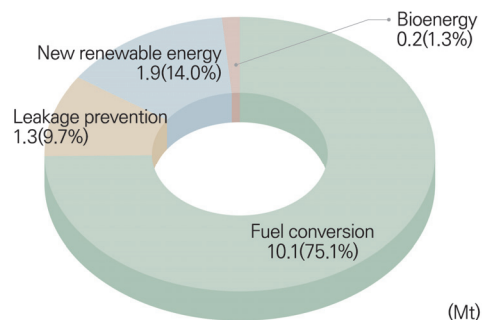
〈Table II-11〉 Projects and Certified Reductions
(Domestic)



〈Figure II-14〉 Proportion of Certified Reductions
(Domestic)

Project type	No. of Projects	Certified (Mt)
Total	607	13.5
Fuel conversion	564	10.1
Leakage prevention	8	1.3
New renewable energy	28	1.9
Bioenergy	7	0.2

〈Table II-12〉 Projects and Certified Reductions
(Overseas)



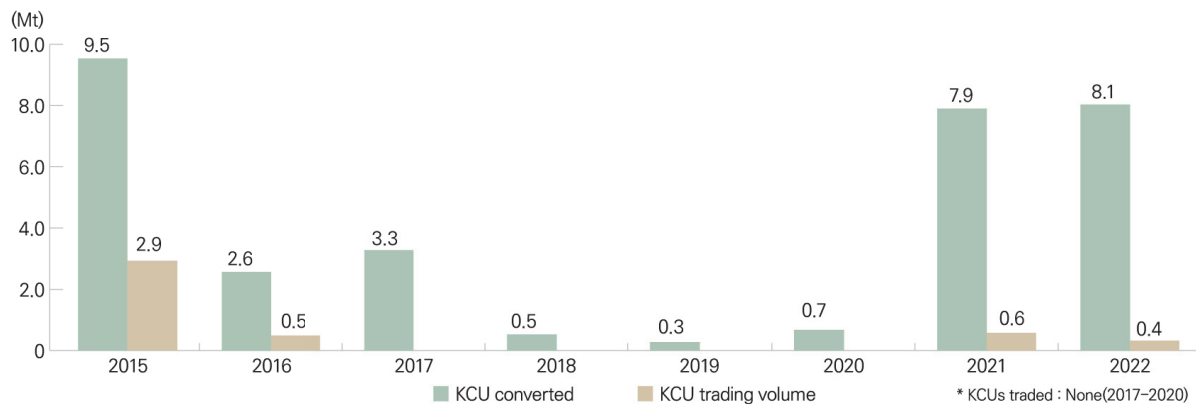
〈Figure II-15〉 Proportion of Certified Reductions
(Overseas)

To date, a total of 33.6 Mt²⁰⁾ has been converted from KOCs into KCUs by covered entities to be used for the surrender of emission permits. The amount converted into KCUs in the 2023 compliance year was 0.7 Mt, with 0.5 Mt from domestic projects and 0.2 Mt from overseas projects, which was significantly lower for both types of project compared to the amount converted in the 2022 compliance year (8.1 Mt; 7.4 Mt from domestic projects and 0.7 Mt from overseas projects). The amount of KCUs converted from KOCs, which was less than 1 Mt during Phase II, increased sharply to over 7 Mt in Phase III but has since

20) 33.6 Mt = 15.4 Mt from Phase I + 1.5 Mt from Phase II + 16.7 Mt from Phase III.

returned to the Phase II level. This appears to be due to the exhaustion of KCUs converted from KOCs, the volume of which had increased after restrictions on the KOC conversion and trading period were relaxed, which was implemented after the amendment²¹⁾ of the guidelines for GHG offset projects.

In the 2023 compliance year, a total of 1.1 Mt of KCU23 was surrendered by 21 entities (accounting for 0.2% of all permits surrendered). This consisted of 0.7 Mt converted from KOCs and 0.5 Mt of KCU22 banked from the previous year. The remaining 0.1 Mt was carried over to the 2024 compliance year. After the 2023 compliance year, 18.4 Mt of KOCs remained unconverted into KCUs as of September 2024.

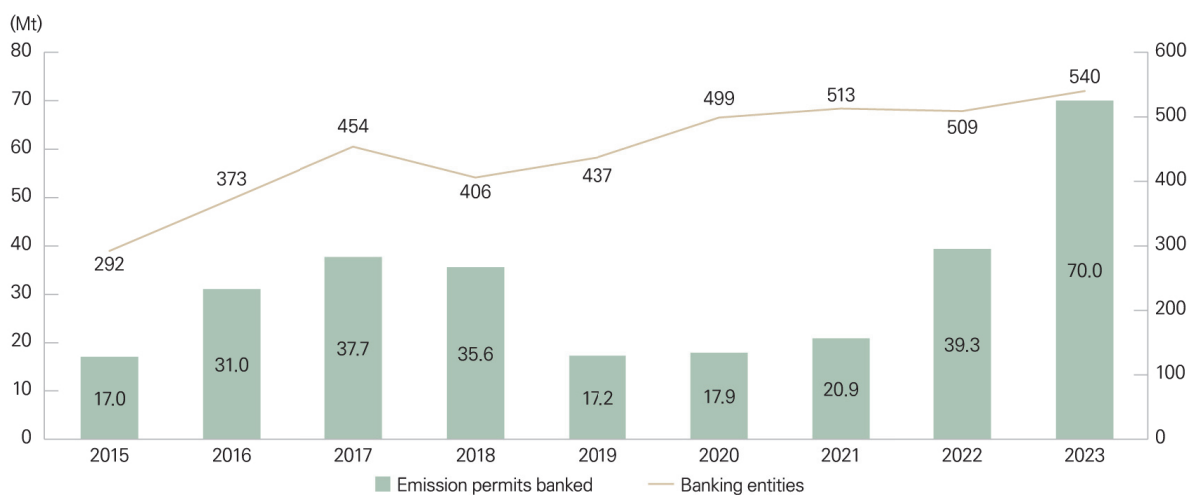


〈Figure II-16〉 KCUs Converted and Traded by Compliance Year

21) Guidelines for the Feasibility Assessment of Offset Projects and the Certification of Reductions (partially amended and entered into force on 9 Nov. 2023).

2.3.2. Banking of Emission Permits

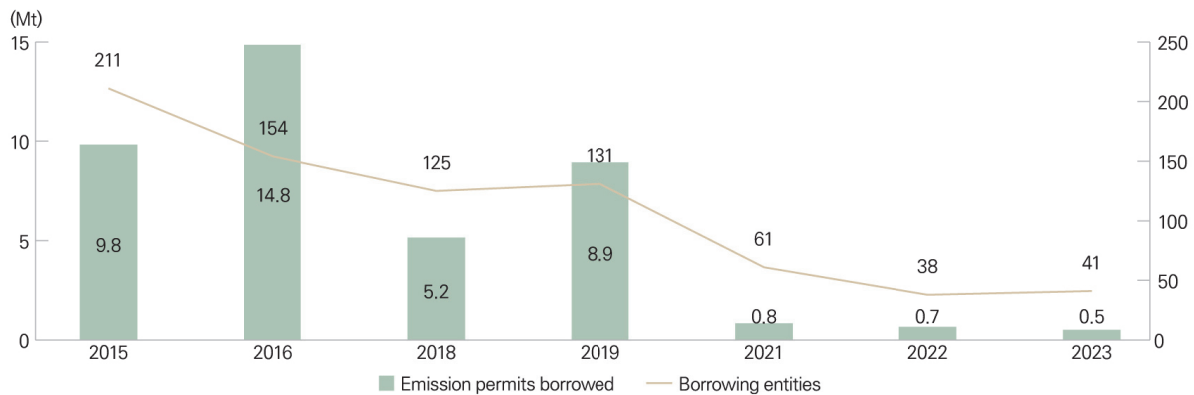
A total of 39.3 Mt of emission allowances were carried over from the 2022 compliance year to 2023, all of which were utilized for trading and compliance purposes. For the 2023 compliance year, a total of 70.0 Mt were carried over to 2024, representing a 78.1% increase from the previous year. This included 69.9 Mt of KAU and 0.1 Mt of KCU carried over by 544 entities. During the 2016–2018 compliance years, more than 30 Mt of allowances were carried over annually. However, with the introduction of banking restrictions through the amended Allocation Plan during Phase II, the banking volume was reduced by half in 2019. Since then, the banking amount has shown an increasing trend, influenced by the easing of banking restrictions under the revised Allocation Plan for Phase III. In the 2023 compliance year, the banking volume resulting from proprietary trading by securities companies amounted to 2.1 Mt (10 institutions), while the volume carried over by market makers was 4.9 Mt (8 institutions).



〈Figure II-17〉 Banking of Emission Permits by Compliance Year

2.3.3. Borrowing of Emission Permits

The emission permits borrowed from the 2024 compliance year for the 2023 compliance year amounted to 0.5 Mt (41 entities), representing 0.1% of the total amount of emission permits surrendered. While the number of entities that borrowed emission permits remained similar to the previous year (38 entities), the amount of emission permits borrowed for the 2023 compliance year decreased by 22.6% compared to the previous year (0.7 Mt). It appears that covered entities have primarily utilized flexibility mechanisms, such as banking from the previous compliance year and the conversion of KOCs to KCUs, and auctions to prepare for a possible supply shortage of emission permits in the future.



〈Figure II-18〉 Borrowing of Emission Permits by Compliance Year

〈Table II-13〉 Legal Grounds and Standards for the Flexibility Mechanisms in Phase III

Type	Legal Grounds	Methods and Standards
Use of KCUs	Art. 29 of the Act Art. 47 of the Enforcement Decree	- If a covered entity possesses or acquires GHG reduction credits generated outside the scope of business operations monitored by the K-ETS in a manner consistent with international standards, it may convert them into KCUs for the trading and surrendering of emission permits, etc. - The maximum number of KCUs that may be used for the surrender of emission permits shall be determined in accordance with an allocation plan within 10% of the total amount of emission permits the covered entity is required to surrender.
Borrowing	Art. 28 of the Act Art. 45 of the Enforcement Decree	- When the amount of emission permits held by a covered entity is less than the amount it must surrender, a portion of allocated emission permits from a different compliance year within the same phase may be borrowed. 〈Borrowing Limits in Phase III〉 1st compliance year: (no more than) emission permits to be surrendered × 15% 2nd–4th compliance year: (no more than) emission permits to be surrendered × {borrowing limit in the immediately preceding compliance year – (ratio of borrowed emission permits in the immediately preceding compliance year × 0.5)} 5th compliance year: borrowing from the subsequent phase is not allowed.
Banking	Art. 28 of the Act Allocation Plan	- A covered entity may carry over emission permits in its possession to the next compliance year within the same phase or to the first compliance year in the subsequent phase provided that it banks KAUs and KCUs of less than 100 t regardless of the standards specified below. 〈Banking within a Single Phase〉 1st–2nd compliance years: twice the net amount of KAUs/KCUs sold* by the covered entity in each (first and second) compliance year. 3rd compliance year: three times the net amount of KAUs/KCUs sold* by the covered entity in the compliance year. 4th compliance year: five times the net amount of KAUs/KCUs sold* by the covered entity in the compliance year. * Amount of KAUs/KCUs sold – amount of KAUs/KCUs purchased until the day before the covered entity applied for banking to the next compliance year, excluding the amount exchanged (KAU, KCU ↔ KAU, KCU, KOC) and auctioned. 〈Banking across Phases〉 - Five times the annual average net amount of KAUs/KCUs sold* by the covered entity in the fifth compliance year of Phase III. * Amount of KAUs/KCUs sold – amount of KAUs/KCUs purchased until the day before the covered entity applied for banking for Phase IV, excluding the amount exchanged (KAU21–25, KCU21–25 ↔ KAU, KCU, KOC from another phase) and auctioned. - Emission permit holders other than covered entities may carry over permits to the next compliance year within the same phase or to the first compliance year in the subsequent phase.

Type	Legal Grounds	Methods and Standards
		〈Banking within a Single Phase〉 – Emissions trade brokerage companies and third-party participants: KAUs and KCUs within the maximum holding limit for each compliance year. – Market makers: all KAUs and KCUs in their possession. 〈Banking across Phases〉 – Emissions trade brokerage companies and third-party participants: KAU25 and KCU25 within the maximum holding limit for each compliance year. – Market makers: all KAUs and KCUs in their possession.

* Source: Act on the Allocation and Trading of Greenhouse-Gas Emission Permits (Ministry of Environment, Office for Government Policy Coordination, and Ministry of Economy and Finance; partially amended on 7 February 2025)
 Enforcement Decree of the Act on the Allocation and Trading of Greenhouse-Gas Emission Permits (Ministry of Environment, Office for Government Policy Coordination, and Ministry of Economy and Finance; partially amended on 7 February 2025)
 Revised Allocation Plan for Phase III (2021–2025) (Ministry of Environment, December 2024)

III

Analysis of the Emissions Trading Market

1. Trading Records for 2015–2024
2. Trading Records for the 2023 Compliance Year of Phase III

1

Trading Records for 2015–2024

Emission permits can be traded through the exchange and OTC markets. The tradable permits are KAUs, KCUs, and KOCs. Exchange trading commences with the listing of tradable permits on the emission permit exchange²²⁾ and ends with the delisting of these emission permits; accordingly, different trading periods are applied to each type of permit in exchange trades. On the other hand, for OTC trading, emission permits are traded based on contracts directly entered into between covered entities.

In Part III, trading records for KAUs (KAU15–KAU25), KCUs (KCU15–KCU23), and KOCs (KOC20–22–KOC24–29) traded during Phases I, II, and III (January 2015–August 2024) are analyzed. The analysis of KAUs is based on records of exchange and OTC transactions and auction results, while the analysis of KCUs and KOCs is based on records of exchange and OTC transactions.

22) In accordance with Article 22 of the Act and Article 34 of the Enforcement Decree, the KRX was designated as the emission permit exchange (Jan. 2014) and has been in operation since the introduction and implementation of the K-ETS (since Jan. 2015).

1.1. Trading Volume and Price Trends by Year²³⁾

From the commencement of Phase I to the end of the 2023 compliance year in Phase III (August 2024), the total trading volume for all types of emission permit (KAUs, KCUs, and KOCs) was 414.0 Mt, the total payments were 7,919.9 billion won, and the average trading price was 19,131 won per ton. The yearly trading volume increased at an average annual rate of 103% from 5.7 Mt in 2015 to 12.0 Mt in 2016, 26.3 Mt in 2017, and 47.5 Mt in 2018. Subsequently, it fluctuated, with 38.1 Mt in 2019, 44.0 Mt in 2020, 54.7 Mt in 2021, 39.1 Mt in 2022, and 89.9 Mt in 2023. The trading volume reached 56.7 Mt as of August 2024, representing a slight decrease (6.3%) compared to the same period in the previous year (60.5 Mt).

Broken down by market type, the trading volume was 253.3 Mt (61.2%) in the exchange market and 160.7 Mt (38.8%) in the OTC market. In terms of the type of emission permit, the total trading volume for KAUs was 364.4 Mt, which accounted for 88.0% of the total trading volume for emission permits, indicating that most of the emission permits traded were KAUs. The total trading volume for KCUs was 4.4 Mt and that for KOCs was 45.2 Mt, accounting for 1.1% and 10.9% of the total trading volume, respectively.

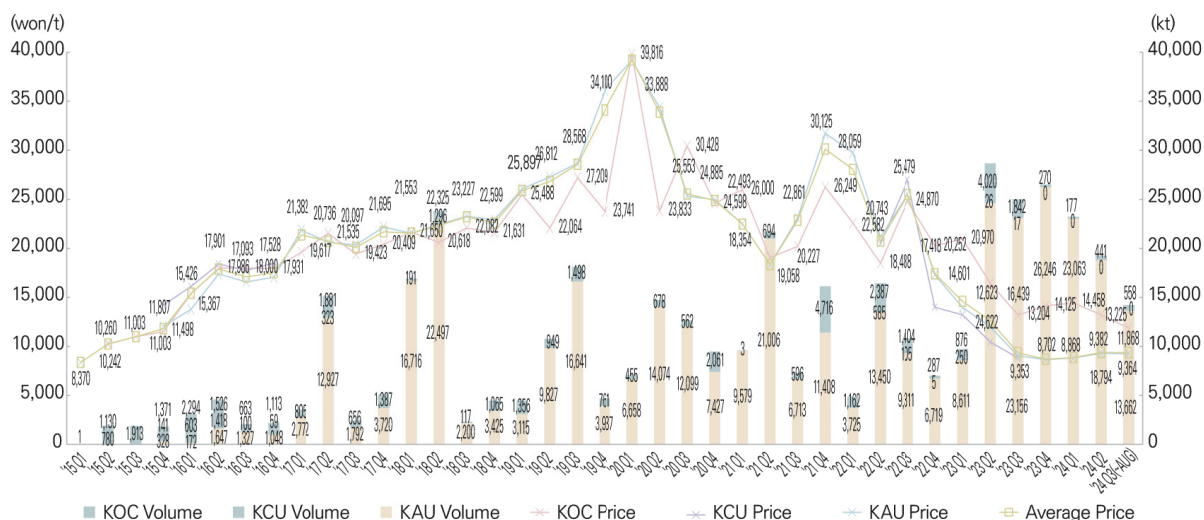
The average trading price for all emission permits per year increased significantly at an average annual rate of 22.5% from 11,013 won in 2015 to 30,411 won in 2020. Since then, due to damage caused by Typhoon Hinnamno and reduced production activity resulting from the global economic slowdown, the price declined to 23,149 won in 2021, 22,370 won in 2022, 10,772 won in 2023, and 9,167 won in 2024 (as of August). The average trading price for Phases I, II, and III (until August 2024) was 19,131 won.

Broken down by the type of emission permit, the average trading price was 19,952 won for KOCs, 19,058 won for KAUs, and 16,774 won for KCUs. The average trading price for KAUs, which accounted for 88% of the total trading volume for emission permits, rose from 12,044 won in 2015 to 30,713 won in 2020 and fell to 22,943 won in 2021, 22,574 won in 2022, and 10,316 won in 2023. As of August 2024,

²³⁾ The amount of emission permits that must be surrendered is determined based on the amount of certified emissions for each compliance year (1 Jan.–31 Dec.), but emission permits can be traded from the date of the listing of emission permits on the KRX (exchange trading) or the date of the allocation of emission permits (OTC trading) until the date of the surrender of those emission permits (e.g., KAU23 was traded between 4 Jan. 2021 and 30 Aug. 2024).

the average 2024 trading price for KAUs was 9,091 won, which was 11.9% lower than the previous year. The average trading price for KOCs, the second-most traded emission permit, exhibited a similar trend of fluctuations to KAUs. It rose from 10,962 won in 2015 to 27,176 won in 2020 and fell to 24,821 won in 2021, 21,202 won in 2022, and 16,066 won in 2023. It then fell again to 12,767 won in 2024, which was 20.5% lower than the previous year. The average trading price for KCUs was 10,889 won in 2015, 17,747 won in 2016, and 20,622 won in 2017, but there was no record of KCU trading between 2018 and 2021. The trading of KCUs resumed in 2022 with an average trading price of 21,436 won. The average trading price for KCUs was 12,722 won in 2023, but no transactions had been recorded as of August 2024.

The continuous increase in the trading volume and average trading price from 2015 led to an increase in total payments from 62.4 billion won in 2015 to 1,338.5 billion won in 2020. Subsequently, they continued to decline to 1,266.6 billion won in 2021, 875.6 billion won in 2022, and 968.8 billion won in 2023. The total payments for emission permits for 2024 (until August) were 519.7 billion won, 40.6% lower than that for the previous year.



〈Figure III-1〉 Trends in the Total Trading Volume and Price by Emission Permits

〈Table III-1〉 Trends in Trading Records by Trading Type

Type			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024*
Trading volume (kt)	Exchange	Real-time	51	2,062	4,640	4,814	4,636	8,263	13,574	11,174	69,876	42,739
		Block	1,191	2,771	10,094	8,351	4,373	4,520	1,119	1,120	1,034	686
		Auction	–	274**	–	4,665**	7,950	8,171	11,177	13,642	7,888	2,436
	OTC		4,421	6,861	11,530	29,677	21,125	23,059	28,846	13,205	11,138	10,834
	Total		5,663	11,969	26,264	47,507	38,084	44,013	54,716	39,140	89,936	56,696
Trading Price (won/t)	Exchange	Real-time	12,208	17,953	21,315	22,271	29,414	28,785	20,981	20,711	9,992	8,793
		Block	11,140	17,728	21,064	22,127	28,254	29,802	23,011	20,431	12,373	9,959
		Auction	–	16,221**	–	22,500**	29,238	30,385	26,373	23,243	10,672	8,901
	OTC		10,965	16,549	20,706	22,034	27,965	31,122	22,926	23,037	15,584	10,653
	Total		11,013	17,056	20,951	22,120	28,440	30,411	23,149	22,370	10,772	9,167
Payments (100 million won)	Exchange	Real-time	6	370	989	1,072	1,364	2,378	2,848	2,314	6,982	3,758
		Block	133	491	2,126	1,848	1,236	1,347	257	229	128	68
		Auction	–	44**	–	1,050**	2,324	2,483	2,948	3,171	842	217
	OTC		485	1,135	2,387	6,539	5,908	7,176	6,613	3,042	1,736	1,154
	Total		624	2,041	5,503	10,509	10,831	13,385	12,666	8,756	9,688	5,197

* Trading records until August 2024

** The amount auctioned from the reserve for market stabilization measures to address the imbalance in the supply and demand for emission permits in the 2015 and 2017 compliance years, not the amount allocated for auctions that were introduced in Phase II

〈Table III-2〉 Trends in Trading Volume by Emission Permit

(Unit : kt)

Type			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024*
KAU	Exchange	Real-time	13	918	3,641	4,588	4,485	8,073	12,101	11,025	69,222	42,484
		Block	308	1,370	10,067	8,278	3,343	4,490	641	484	92	678
		Auction	–	274**	–	4,665**	7,950	8,171	11,177	13,642	7,888	2,436
	OTC		8	1,631	7,504	27,307	17,742	19,523	24,787	8,055	5,433	9,921
	Total		329	4,193	21,212	44,838	33,520	40,257	48,707	33,205	82,635	55,520
KCU	Exch-ange	Real-time	38	482	296	–	–	–	–	5	7	–
		Block	883	1,401	27	–	–	–	–	585	266	–
	OTC		–	296	–	–	–	–	–	105	20	–
	Total		921	2,180	323	–	–	–	–	695	293	–
KOC	Exchange	Real-time	–	662	703	226	151	190	1,473	144	647	255
		Block	–	–	–	73	1,030	30	477	51	676	8
	OTC		4,413	4,934	4,026	2,370	3,383	3,536	4,059	5,044	5,685	913
	Total		4,413	5,596	4,729	2,670	4,565	3,756	6,009	5,240	7,008	1,176

* Trading records until August 2024

** The amount auctioned from the reserve for market stabilization measures to address the imbalance in the supply and demand for emission permits in the 2015 and 2017 compliance years, not the amount allocated for auctions that were introduced in Phase II

〈Table III-3〉 Trends in Average Trading Price by Emission Permit

(Unit : won/t)

Type			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024*
KAU	Exch- ange	Real- time	10,998	17,712	21,314	22,208	29,384	28,633	19,887	20,639	9,986	8,776
		Block	12,073	17,366	21,065	22,105	28,780	29,733	16,339	20,495	10,875	9,946
		Auction	-	16,221**	-	22,500**	29,238	30,385	26,373	23,243	10,672	8,901
	OTC		12,700	16,169	20,867	22,139	28,653	31,935	23,059	24,215	13,988	10,423
	Total		12,044	16,901	21,038	22,178	28,902	30,713	22,943	22,574	10,316	9,091
KCU	Exch- ange	Real- time	12,637	18,173	20,605	-	-	-	-	14,000	7,938	-
		Block	10,815	18,082	20,813	-	-	-	-	20,501	12,971	-
	OTC		-	15,471	-	-	-	-	-	27,000	11,105	-
	Total		10,889	17,747	20,622	-	-	-	-	21,436	12,722	-
KOC	Exch- ange	Real- time	-	18,127	21,617	23,530	30,302	35,266	29,962	26,457	10,660	11,471
		Block	-	-	-	24,636	26,549	40,013	31,979	19,014	12,343	11,000
	OTC		10,962	16,739	20,405	20,826	24,358	26,633	22,114	21,074	17,124	13,145
	Total		10,962	16,903	20,585	21,160	25,049	27,176	24,821	21,202	16,066	12,767

* Trading records until August 2024

** The amount auctioned from the reserve for market stabilization measures to address the imbalance in the supply and demand for emission permits in the 2015 and 2017 compliance years, not the amount allocated for auctions that were introduced in Phase II

〈Table III-4〉 Trends in Payments by Emission Permit

(Unit : 100 million won)

Type			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024*
KAU	Exch- ange	Real- time	1	163	776	1,019	1,318	2,311	2,407	2,275	6,913	3,729
		Block	37	238	2,121	1,830	962	1,335	105	99	10	67
		Auction	-	44**	-	1,050**	2,324	2,483	2,948	3,171	842	22
	OTC		1	264	1,566	6,046	5,083	6,235	5,716	1,951	760	1,034
	Total		40	709	4,463	9,944	9,688	12,364	11,175	7,496	8,524	5,047
KCU	Exch- ange	Real- time	5	88	61	-	-	-	-	1	1	-
		Block	95	253	6	-	-	-	-	120	35	-
	OTC		-	46	-	-	-	-	-	28	2	-
	Total		100	387	67	-	-	-	-	149	37	-
KOC	Exch- ange	Real- time	-	120	152	53	46	67	441	38	69	29
		Block	-	-	-	18	273	12	153	10	83	0.8
	OTC		484	826	821	494	824	942	898	1,063	973	120
	Total		484	946	973	565	1,143	1,021	1,491	1,111	1,126	150

* Trading records until August 2024

** The amount auctioned from the reserve for market stabilization measures to address the imbalance in the supply and demand for emission permits in the 2015 and 2017 compliance years, not the amount allocated for auctions that were introduced in Phase II

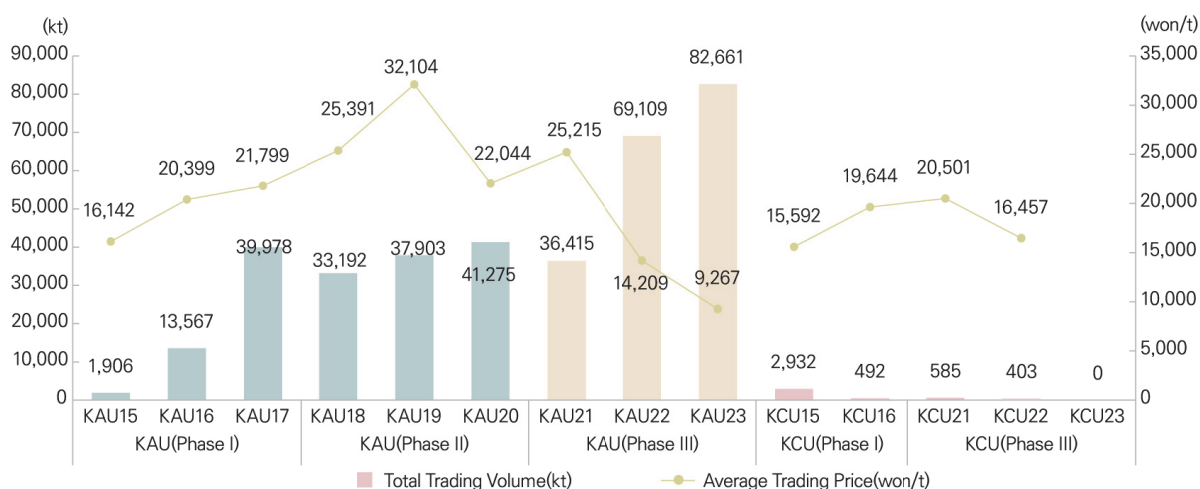
1.2. Trading Volume and Price Trends by Type of Emission Permit

In this section, the trading volume and price for each type of emission permit (KAU, KOC, and KCU) are analyzed for each compliance year. The results of the analysis in this section differ from the results of the analysis of the yearly trading volume in the previous section because different trading periods apply to each compliance year.²⁴⁾

During Phase I, the trading volume for KAUs rose sharply at an average annual rate of 350% to 1.9 Mt (KAU15), 13.6 Mt (KAU16), and 40.0 Mt (KAU17). The trading volume for KAUs also increased during Phase II from 33.2 Mt (KAU18) to 37.9 Mt (KAU19) and 41.3 Mt (KAU20). During Phase III, the trading volume for KAU21 and KAU22 amounted to 36.4 Mt and 69.1 Mt, respectively, and that for KAU23 increased to 82.7 Mt, which was approximately 20% higher than the previous year. The average trading price for KAUs continuously rose from 16,142 won (KAU15) to 32,104 won (KAU19). Since then, due to the impact of COVID-19, damage caused by Typhoon Hinnamno, and reduced production activity resulting from the global economic slowdown, the trading price has experienced sharp fluctuations, including both declines and increases, to 22,044 won (KAU20), 25,215 won (KAU21), and 14,209 won (KAU22). The average trading price for KAU23 was 9,267 won, 34.8% lower than the previous year.

During Phase I, 2.9 Mt of KCU15 and 0.5 Mt of KCU16 were traded. There was no record of the trading of KCUs during Phase II. The trading of KCUs resumed in Phase III, during which 0.6 Mt of KCU21 and 0.4 Mt of KCU22 were traded. The highest average trading price for KCUs was 20,501 won for KCU21, while the average trading price for KCU22 was 16,457 won, 19.7% lower than the previous year. No transactions were recorded for KCU23.

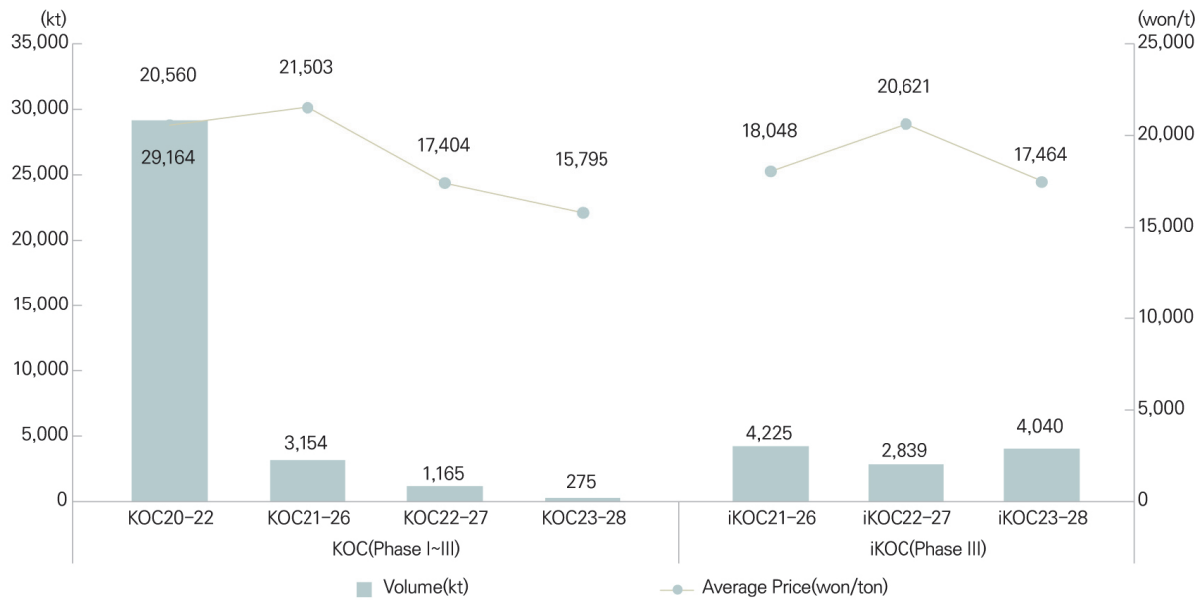
24) KAU23 refers to KAUs allocated for the 2023 compliance year, and, in the exchange market, they can be traded from the date of their listing on the KRX until the date of their surrender. Accordingly, KAU23 was traded from 4 January 2021 to 30 August 2024.



〈Figure III-2〉 Total Trading Volume and Average Trading Price(KAU, KCU)

Unlike KAUs and KCUs, KOCs are not used for the surrender of emission permits and can be traded by entities other than covered entities. Trends in the trading of KOCs could not be determined because, since June 2021, KOCs have been renamed²⁵⁾ so their trades are subject to fixed trading periods. Nevertheless, of note is that the trading volume for iKOCs (certified reductions from overseas offset projects) often exceeds the trading volume for KOCs (certified reductions from domestic offset projects) and it is notable that iKOCs have generally been traded at higher prices than KOCs, except for KOC21–26.

25) KOCs issued prior to the revision of the guidelines for KOC certification (2015–2021) were renamed KOC20–22.



〈Figure III-3〉 Total Trading Volume and Average Trading Price(KOC)

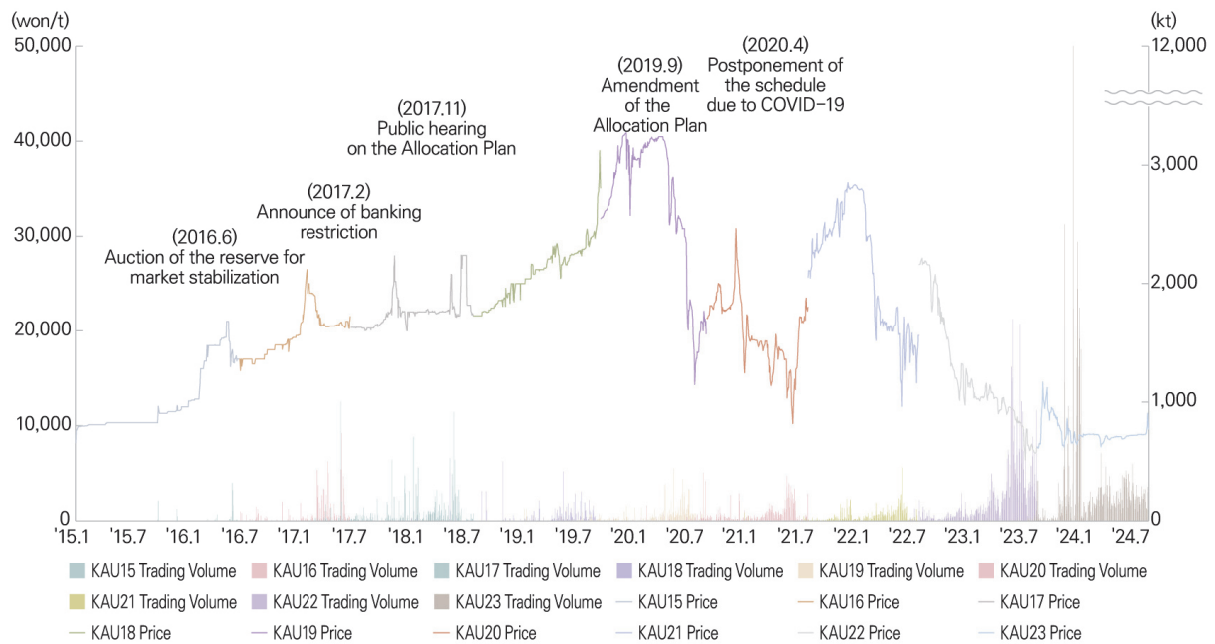
1.3. Changes in the Trading Records for Each Phase

In the K-ETS, the operational procedures and schedule often tend to serve as an incentive for the trading of emission permits. Covered entities determine their amount of GHG emissions by submitting emissions reports to the government by the end of March every year. It has been observed that covered entities tend to commence emission permit trading from this point on and trade emission permits most actively during a period of one to three months before completion of the surrender of emission permits. In addition, trading volumes and prices have tended to fluctuate in response to policy changes. In this section, factors contributing to changes in the exchange trading records for KAUs for each phase are analyzed.

The price for KAUs, which was 8,640 won on the first trading day of Phase I, exhibited an overall upward trajectory during this phase. It fluctuated sharply around the time emission permits from the reserve for market stabilization measures were auctioned (May 2016) and restrictions on the banking of emission permits were announced (February 2017) but stabilized thereafter. Ultimately, the price rose to reach 21,600 won on the last trading day (9 August 2018), representing a 2.5-fold increase compared to the price on the first trading day.

During Phase II, the trading volume and trading price for KAUs rose until the first quarter of 2020 due to increased demand for emission permits. The price temporarily declined after sub-sector meetings were held (May 2019) and the Allocation Plan was amended (September 2019) to reflect the amended Roadmap specifying the updated NDC. However, the price for KAUs continued to rise steadily until April 2020 to reach the 40,500 won range. Subsequently, it sharply decreased due to the impact of COVID-19, reaching 22,500 won on the last trading day of Phase II (11 August 2021).

At the beginning of Phase III, the price rose again to reach the 35,000 won range in early 2022. However, it steadily declined thereafter to reach 9,648 won on the last trading day of the 2023 compliance year (30 August 2024).



Note: For convenience, only the price and trading volume of the index emission permits for the corresponding periods are used. For example, although the trading of KAU21 began in 2020, the above graph is based the amount of KAU21 traded only in the 2021

〈Figure III-4〉 Trading Price and Volume for KAU15-KAU23 in the Exchange Market

2

Trading Records for the 2023 Compliance Year of Phase III

During the period in which KAU23 was listed on the KRX (January 2021–August 2024),²⁶⁾ KAU20–25, KCU21–23, and KOCs were traded in the exchange and OTC markets. In this section, trading records for KAU23 and KCU23 used for the surrender of emission permits for the 2023 compliance year and KOCs²⁷⁾ are analyzed, for which the total trading volume was 102.1 Mt.

2.1. Analysis of the Trading Volume

In the 2023 compliance year, the trading volume was 82.7 Mt for KAU23 and 19.4 Mt for KOCs, while no transactions were recorded for KCU23. These accounted for 81.0%, 19.0%, and 0% of the total trading volume, respectively.

The trading of KAU23 began in January 2021 but, until May 2023, KAU23 was traded sporadically only in the OTC market without any notable trends. In the first quarter of 2023, 0.5 Mt was traded, followed by 0.04 Mt in the second quarter. Full-scale trading of KAU23 commenced after the trading of KAU22 ended. In the third quarter of 2023, 4.5 Mt of KAU23 were traded, and the trading volume increased sharply in the fourth quarter of 2023, reaching a quarterly peak of 26.2 Mt, which accounted for 31.8% of the total trading volume for KAU23. This trend continued in the first quarter of 2024, with the trading volume reaching 21.9 Mt, which was equivalent to 26.4% of the total trading volume for KAU23. Subsequently, 16.8 Mt was traded in the second quarter and 11.0 Mt in the third quarter before the 2023 compliance year ended on 30 August 2024.

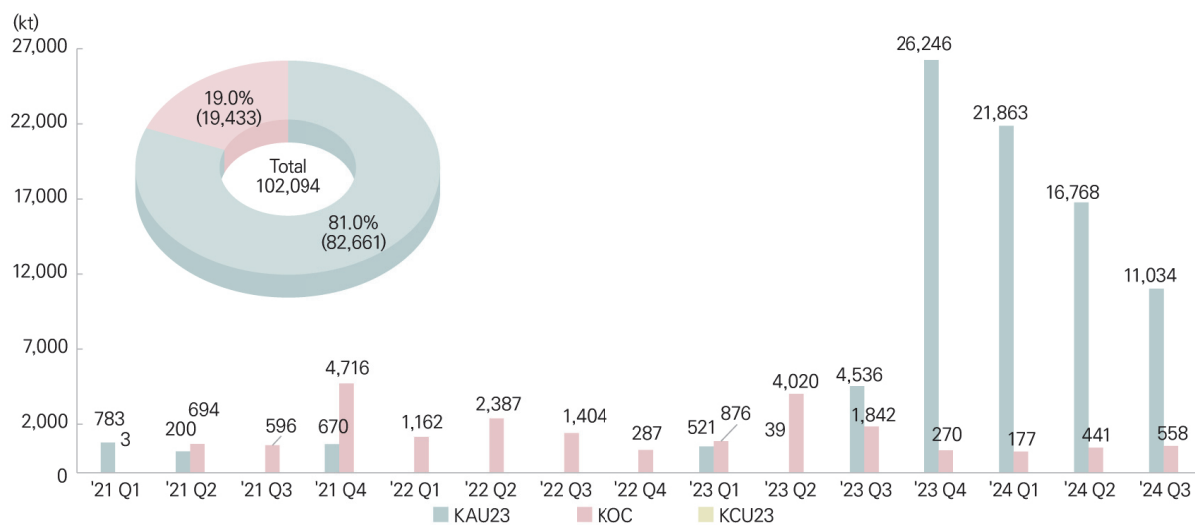
The trading volume for KOCs significantly increased in the fourth quarter of 2021, which was due to the fact that Certified Emission Reductions (CERs) issued in the past were only allowed to enter the K-ETS beginning in 2021. However, the trading volume for KOCs fell dramatically in the first to third quarters of 2024 compared to the same period in the previous year. This appears to be due to the exhaustion of KCUs converted from KOCs, the volume of which had increased following the imposition

26) KAU23 and KCU23 were traded from 4 January 2021 to 30 August 2024 and 8 March 2023 to 30 August 2024, respectively.

27) KOCs include KOC20–22, KOC21–26, KOC22–27, KOC23–28, KOC24–29, iKOC21–26, iKOC22–27, iKOC23–28, and iKOC24–29.

of restrictions on the KOC conversion and trading period, which was implemented after the amendment²⁸⁾ of the guidelines for GHG offset projects.

The trading volume for KOCs did not demonstrate any notable trends because KOCs consist of emission permits from different trading periods. The trading volume for KOCs reached a quarterly record of 4.7 Mt in the fourth quarter of 2021, which accounted for 24.3% of the total trading volume for KOCs. From the first to third quarters of 2022, it remained in the range of 1.2 Mt to 2.4 Mt. The trading volume for KOCs fell dramatically to 1.0 Mt in the fourth quarter of 2022 and the first quarter of 2023 and increased to 4.0 Mt in the second quarter and 1.8 Mt in the third quarter of 2023. Subsequently, from the fourth quarter of 2023 to the third quarter of 2024, it remained in the range of 0.3 Mt to 0.6 Mt.



Note: The third quarter of 2024 includes the trading volume until August.

〈Figure III-5〉 Quarterly Trading Volume by Emission Permit

28) Guidelines for the Feasibility Assessment of Offset Projects and the Certification of Reductions (partially amended and entered into force on 9 Nov. 2023).

The emissions trading market is largely divided into the exchange market and the OTC market. On the exchange market, emission permits are traded via real-time trading and block trading,²⁹⁾ which can be used by all covered entities, or via auctions.

Of the 82.7 Mt of KAU23 traded, 73.9 Mt was traded in the exchange market and 8.8 Mt was traded in the OTC market, accounting for 89.4% and 10.6%, respectively. Specifically, the amount of KAU23 traded via real-time exchange trading was 67.6 Mt, which accounted for the highest proportion of the trading volume for KAU23, followed by the amount traded via auction (5.9 Mt), OTC trading (8.8 Mt), and block exchange trading (0.4 Mt). Of note was that the proportion of exchange trading for KAU23 has grown compared to KAU22 (87.9% for the exchange market and 12.1% for the OTC market) due to a sharp increase in real-time exchange trading.

Full-scale real-time trading of KAU23 began in the second quarter of 2023 (0.04Mt) and continued to increase thereafter. The real-time trading volume for KAU23 was 1.5 Mt in the third quarter of 2023, and reached a quarterly record of 23.6 Mt in the fourth quarter of 2023. The real-time trading volume was 20.9 Mt in the first quarter, 13.3 Mt in the second quarter, and 8.2 Mt in the third quarter of 2024 (as of August).

Auctions for KAU23, which began in July 2023, exhibited a trend similar to that observed for the real-time trading of KAU23. The volume for valid bids was 2.5 Mt in the third quarter and 2.6 Mt in the fourth quarter of 2023 but fell sharply starting in the first quarter of 2024. The volume of valid bids was 0.5 Mt in the first quarter and 0.3 Mt in the second quarter of 2024. Auctions scheduled for April were canceled following the adjustment of bids pursuant to Article 7³⁰⁾ of the Regulations for the Additional

29) **Regulations on the Emissions Trading Market Operation Article 44 (Real-Time Trading as a Principle)** (1) In the emissions trading market, emission permits shall be traded independently through competitive real-time trading, which can be divided into real-time trading with a single price and real-time trading with multiple prices. (2) The priority of asking and bidding prices in real-time trading shall be as follows:

1. Selling orders with a lower asking price shall take precedence over selling orders with a higher asking price, and buying orders with a higher bidding price shall take precedence over buying orders with a lower bidding price;
2. Regarding orders with the same price, the order that was submitted earlier shall take precedence over the order that was submitted later.

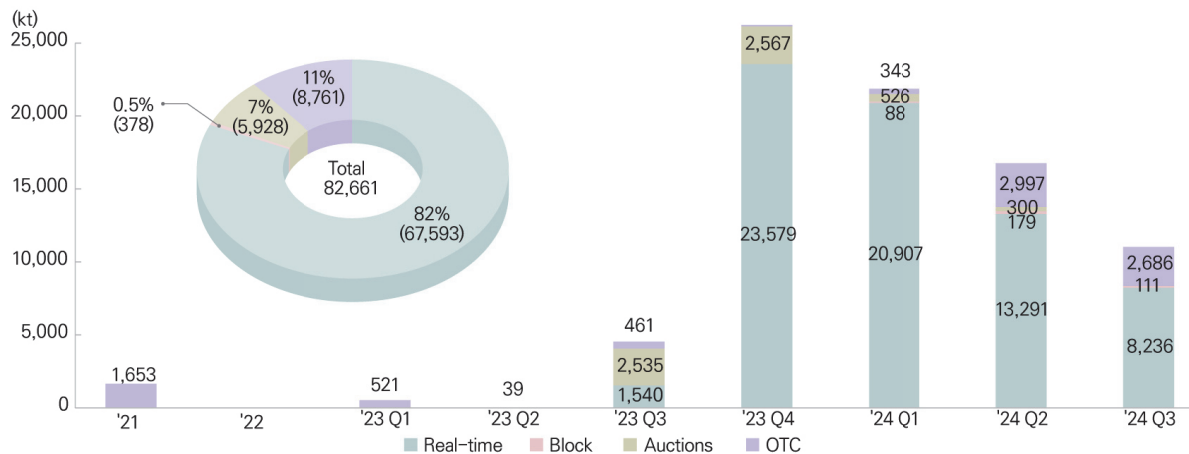
Article 47 (Block Trading) (1) Notwithstanding the provisions of Articles 44 to 46, the Exchange may allow general members and external members who are GHG reduction specialists to trade emission permits based on the conditions they have agreed on with other parties in terms of their type, price, and quantity. (2) The price at which the trading under paragraph 1 may be conducted shall not exceed the upper or lower price limits of the day the trading is to be conducted. (3) The time of submission of the order, the quantity of the order, and other necessary matters pertaining to block trading shall be provided for in the detailed rules.

30) **Article 7 (Adjustment or Cancellation of Bids)** The Minister of Environment may adjust or cancel bids in any of the following cases:

Allocation of Emission Permits for Auctions and Market Stabilization Measures. Ultimately, while the total volume of bids made for KAU23 was 16.2 Mt, the total volume of valid bids was 5.9 Mt, representing 32.6% of the total volume of bids made.

The OTC trading volume for KAU23 was 1.7 Mt from the first quarter of 2021 to the fourth quarter of 2022 without any particular trend. In 2023, a total of 1.1 Mt of KAU23 were traded in the OTC market. Although only 0.03 Mt was traded in the first quarter of 2024, the trading volume rebounded in the second quarter to reach 3.0 Mt, with 2.7 Mt recorded by August of the third quarter.

The trading volume for KOCs was 15.7 Mt (80.8%) in OTC trading, 2.5 Mt (13.0%) in real-time exchange trading, and 1.2 Mt (6.2%) in block exchange trading, which indicates that most KOCs were traded in the OTC market. The trend in the OTC trading of KOCs was the same as that in the overall KOC trades.



Note: The third quarter of 2024 includes the trading volume until August.

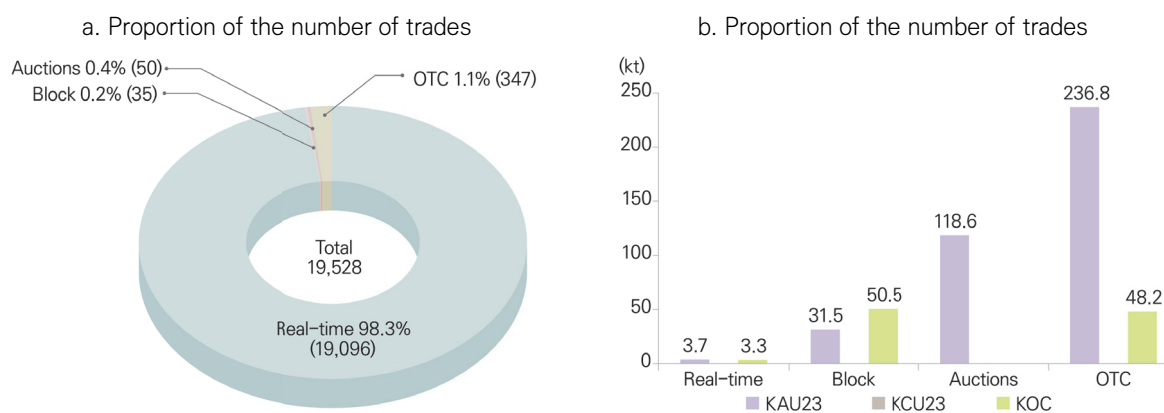
〈Figure III-6〉 Quarterly Trading Volume of KAU23 by Market Type

1. When the bidding rate is significantly low;
2. When the bid price is excessively high or low;
3. When it is difficult to set a fair auction price;
4. When it is deemed difficult to conduct normal bidding due to reasons such as market conditions, etc.

Generally, many small trades occur in the exchange market, while fewer but larger trades occur in the OTC market. In particular, real-time exchange trading involves trades by an unspecified number of entities, including covered entities, market makers, and securities companies. Therefore, the number of emission permit trades conducted via real-time exchange trading tends to far exceed the number of block exchange and OTC trades, which involve one-on-one trades between specific entities, or auctions, which can only be used by covered entities from sub-sectors eligible for auctions, while the average trading volume per trade is the lowest in real-time exchange trading.

Accordingly, a total of 19,528 trades were conducted in the exchange and OTC markets, including 19,181 trades in the exchange market and 347 trades in the OTC market. In the exchange market, 19,096 trades were made via real-time trading, 35 were via block trading, and 50 were via auction. Broken down by the type of emission permit, there were 18,452 trades for KAU23, 0 trades for KCU23, and 1,109 trades for KOCs. In the fourth quarter of 2023 and the first quarter of 2024, a sharp increase in the exchange trading volume for KAU23 led to an increase in the number of KAU23 trades.

The average trading volume for KAU23 per trade was 236.8 kt in OTC trading, 118.6 kt in auctions, 31.5 kt in block exchange trading, and 3.7 kt in real-time exchange trading. Compared to KAU22, the average trading volume per trade has increased in OTC trading and decreased in auctions. The average trading volume for KOCs per trade was highest for block exchange trading, followed by OTC trading and real-time exchange trading.



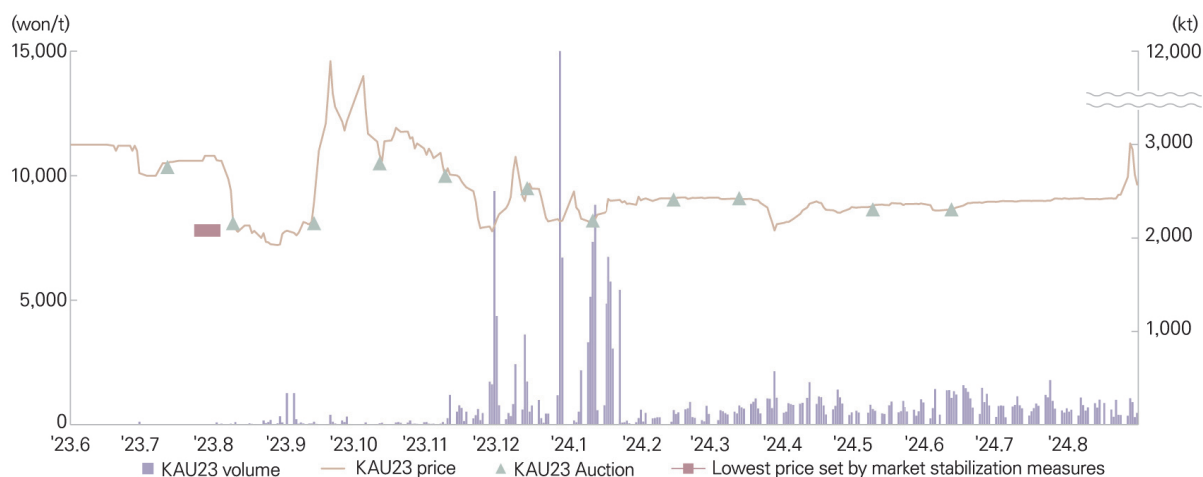
〈Figure III-7〉 Number of Trades and Average Trading Volume by Market in the 2023 Compliance Year

2.2. Analysis of the Trading Prices for KAUs

The exchange trading price of KAU23 ranged between 7,200 and 14,600 won. The monthly average trading price for KAU23 remained at 10,339 won in June and 10,500 won in July 2023 but fluctuated thereafter to 7,829 won in August, 9,271 won in September, and 11,485 won in October. Subsequently, the price fell dramatically to 8,423 won in November before stabilizing at 8,456 won in December.

In 2024, the average exchange trading price for KAU23 ranged between 8,500 won and 9,500 won from January to August. The average trading price on 28 August 2023 was 7,214 won, which was the lowest average exchange trading price for KAU23 during the exchange trading period. Ultimately, the average exchange trading period for KAU23 was 8,684 won.

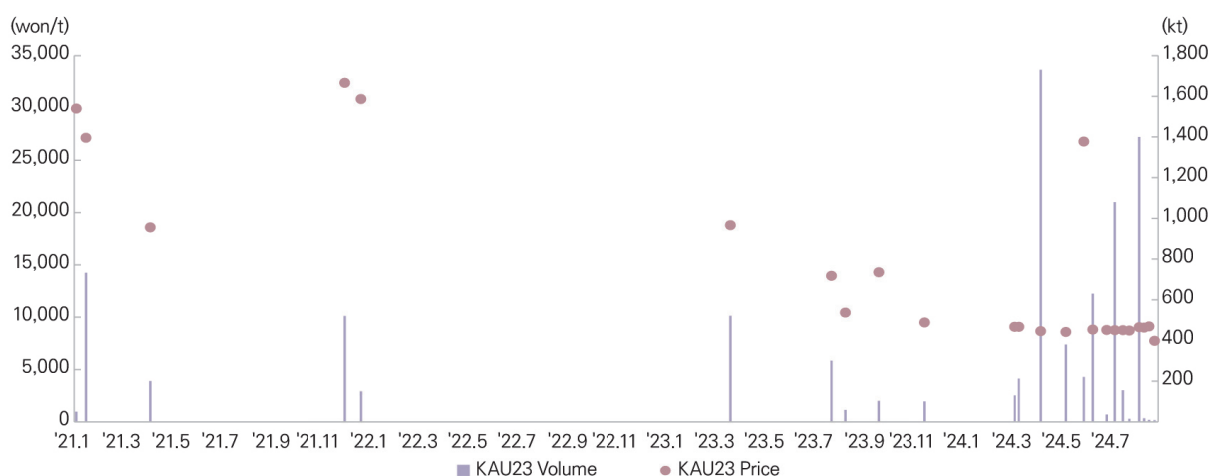
The auction price for KAU23 was 10,350 won in July 2023 when the auctions began, reaching 8,100 won in August and September and 10,500 won in October. However, the price began to fall to 10,000 won in November, 9,500 won in December, and 8,200 won in January 2024. It remained within the range of 8,650 won to 9,100 won between February and June. The average auction price for KAU23 was 9,351 won.



Note: The KAU23 price is weighted average on each trading day. In the absence of trading, the KRX closing price on the trading day was applied.

〈Figure III-8〉 Trading Volume and Price for KAU23 in the Exchange Market

OTC trading of KAU23 began on 6 January 2021. Until December 2021, trading occurred sporadically in a price range of 18,500 won to 32,000 won. The trading price of 32,400 won in December 2021 was the highest OTC trading price for KAU23. Subsequently, no transactions were recorded from January 2022 to February 2023. Although the price remained in the 18,000 won range in March 2023, it sharply fell to an average range of 10,400 won to 14,300 won between July and September 2023. Except for one transaction, KAU23 was traded in a price range between 8,500 won and 9,500 won from November 2023 to July 2024. The 2023 compliance year ended after a single transaction was recorded in August 2024 at 7,750 won, the lowest OTC trading price for KAU23. Ultimately, the average OTC trading price for KAU23 was 13,759 won, which was 58.4% higher than its average exchange trading price.



Note: The KAU23 price is weighted average on each trading day when trading was occurred in the OTC market.

〈Figure III-9〉 Trading Volume and Price for KAU23 in the Over-The-Counter Market

2.3. Analysis of Trading Records by Sector³¹⁾

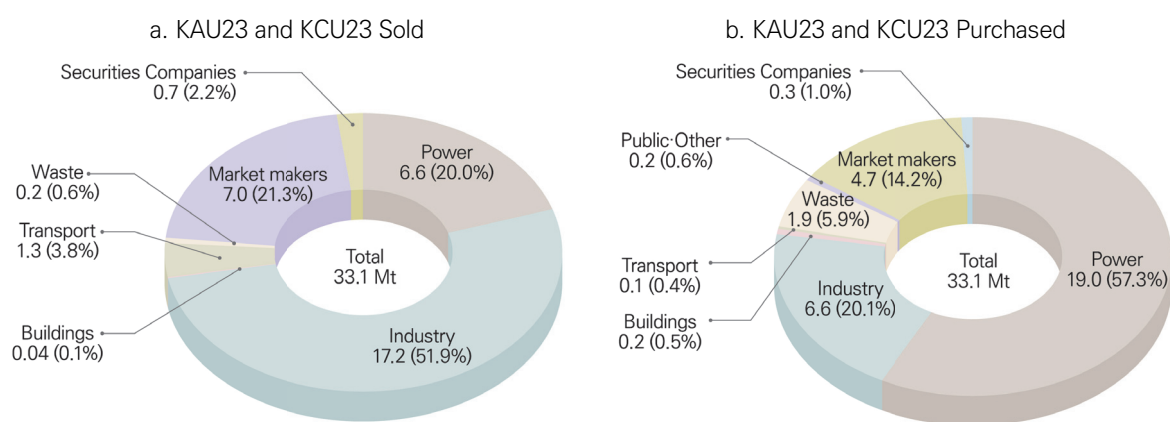
In this section, KAU23 and KCU23 traded in the exchange and OTC markets (excluding the amount auctioned) are analyzed for each sector. Of the total trading volume of 33.1 Mt (33.1 Mt of KAU23 and 0 Mt of KCU23), 24.3 Mt was traded in the exchange market and 8.8 Mt was traded in the OTC market, accounting for 73.5% and 26.5% of the total trading volume, respectively. Broken down by sector, the proportion of emission permits sold was highest in the industry sector and the proportion of emission permits purchased was highest in the power sector, while the proportion of market-maker trades and industry sector trades was second highest for sales and purchases, respectively.

Specifically, 17.2 Mt (51.9%) of KAU23 and KCU23 was sold by the industry sector, 7.0 Mt (21.3%) by market makers, 6.6 Mt (20.0%) by power, 1.3 Mt (3.8%) by transport, 0.7 Mt (2.2%) by securities companies, 0.2 Mt (0.6%) by waste, and 0.04 Mt (0.1%) by buildings. In addition, 19.0 Mt (57.3%) of KAU23 and KCU23 was purchased by the power sector, 6.6 Mt (20.1%) by industry, 4.7 Mt (14.2%) by market makers, 1.9 Mt (5.9%) by waste, 0.3 Mt (1.0%) by securities companies, 0.2 Mt (0.6%) by public services/other, 0.2 Mt (0.5%) by buildings, and 0.1 Mt (0.4%) by transport.

Compared to previous compliance years, in the industry sector, the amount of KAU23 and KCU23 sold for the 2023 compliance year was 7.7% lower compared to the amount sold for the 2022 compliance year (18.6 Mt), and the proportion of KAU23 and KCU23 sold from the total sales of KAU23 and KCU23 also decreased (58.6% → 51.9%). Conversely, the purchase volume and proportion for KAU23 and KCU23 in the industry sector increased (3.4 Mt [10.8%] in 2022 → 6.6 Mt [20.1%] in 2023). In the power sector, the amount of KAU23 and KCU23 sold for the 2023 compliance year was 35.7% higher compared to the amount sold for the 2022 compliance year (4.9 Mt), and the proportion of KAU23 and KCU23 sold from the total sales of KAU23 and KCU23 also increased (15.4% in 2022 → 20.0% in 2023). In the power sector, the amount of KAU23 and KCU23 purchased for the 2023 compliance year was 33.6% higher compared to the amount purchased for the 2022 compliance year (14.2 Mt), and the proportion of KAU23 and KCU23 purchased from the total purchases of KAU23 and KCU23 also increased (44.7% → 57.3%). Compared to the 2022 compliance year, the sales volume and proportion for market makers increased

31) This analysis was conducted based on the trading volume registered in the ETRS because the KRX does not provide data specific to each sector. The trading records provided in this section may thus be different from those provided in "2.1. Analysis of the Trading Volume."

(6.7 Mt [21.1%] in 2022 → 7.0 Mt [21.3%] in 2023), while their purchase volume and proportion decreased (9.6 Mt [30.2%] in 2022 → 4.7 Mt [14.2%] in 2023). In the case of securities companies, the sales volume and proportion increased (0.5 Mt [1.6%] in 2022 → 0.7 Mt [2.2%] in 2023), while the purchase volume and proportion significantly decreased (2.6 Mt [8.1%] in 2022 → 0.3 Mt [1.0%] in 2023). The trading records for market makers and securities companies are analyzed separately in Sections 2.5 and 2.6, respectively.



〈Figure III-10〉 Sales and Purchase Volume by Sector in the 2023 Compliance Year

2.4 Analysis of Trading Records by Sub-Sector³²⁾

In this section, KAU23 and KCU23 traded in the exchange and OTC markets (excluding the amount auctioned) are analyzed for each sub-sector.³³⁾ Of the total trading volume of 33.1 Mt, 7.0 Mt was sold by market makers, which accounted for the highest proportion (21.3%) of the total sales volume for KAU23 and KCU23, followed by 4.3 Mt sold by the power generation/energy sub-sector (13.0%), 3.7 Mt by steel (11.3%), 2.9 Mt by petrochemicals (8.9%), 2.7 Mt by cement (8.2%), and 2.3 Mt by integrated energy (7.0%).

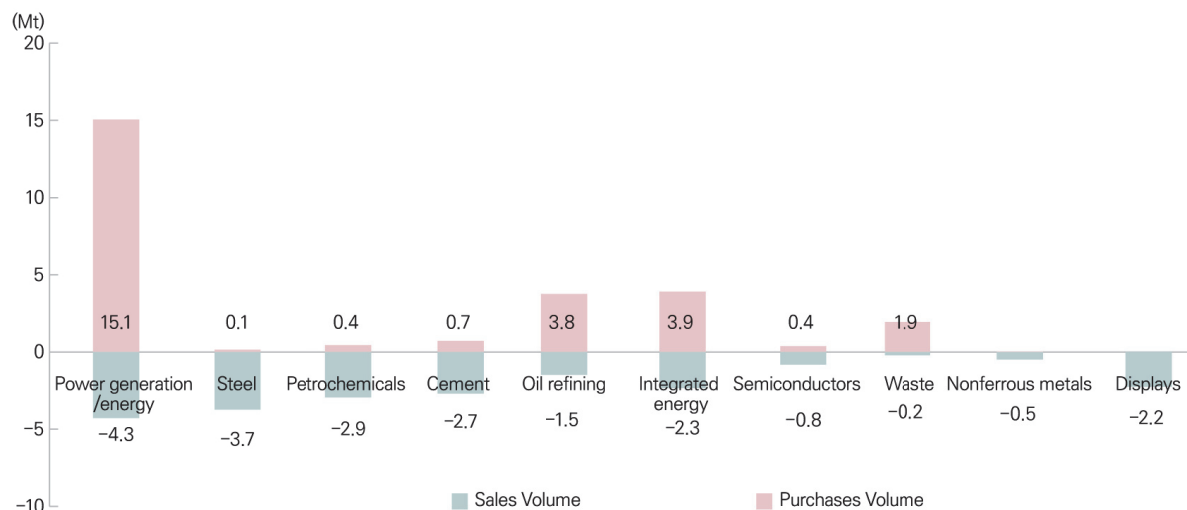
The amount of KAU23 and KCU23 purchased by the power generation/energy sub-sector was 15.1 Mt, which accounted for the highest proportion (45.5%) of the total purchase volume for KAU23 and KCU23, followed by 4.7 Mt purchased by market makers (14.2%), 3.9 Mt by integrated energy (11.8%), 3.8 Mt by oil refining (11.3%), 1.9 Mt by waste (5.9%), and 0.7 Mt by cement (2.2%).

According to the analysis of the trading volume for the 10 sub-sectors³⁴⁾ with the highest certified emissions in the 2023 compliance year, it was confirmed that the power generation/energy, oil refining, integrated energy, and waste sub-sectors were net buyers of emission permits. The net purchase of the power generation/energy, oil refining, integrated energy, and waste sub-sectors was 10.8 Mt, 2.3 Mt, 1.7 Mt, and 1.6 Mt, respectively; the covered entities in these sub-sectors purchased emission permits to make up for a deficit in their emission permits caused by excess certified emissions and thus comply with their obligation to surrender emission permits. In the steel, petrochemical, and cement sub-sectors, which ranked second to fourth in terms of certified emissions, respectively, the amount of emission permits sold exceeded the amount of those purchased by 3.6 Mt, 2.5 Mt, and 2.0 Mt, respectively.

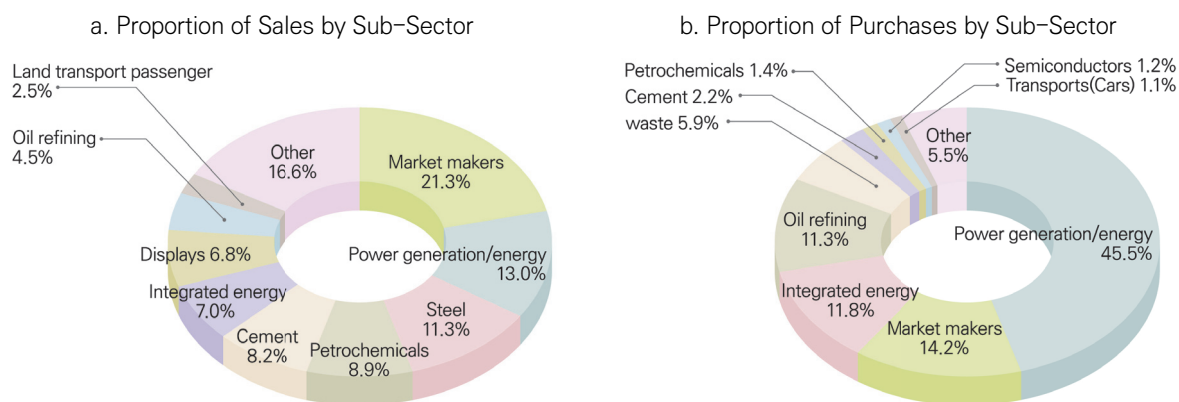
32) This analysis was conducted based on the trading volume registered in the ETRS because the KRX does not provide data specific to sub-sector trades. The trading records provided in this section may thus be different from those provided in “2.1. Analysis of the Trading Volume.”

33) A total of 31 sub-sectors, market makers, and securities companies.

34) The amount of certified emissions was the highest in the power generation/energy sub-sector, followed by steel, petrochemicals, cement, oil refining, integrated energy, semiconductors, waste, nonferrous metals, and displays.



〈Figure III-11〉 Sales and Purchases of the 10 Sub-Sectors with the Highest Certified Emissions in the 2023 Compliance Year



〈Figure III-12〉 Proportion of Sales and Purchases by Sub-Sector in the 2023 Compliance Year

2.5. Analysis of the Trading Records for Market Makers³⁵⁾

In accordance with Article 22-2 of the Act, the government introduced the market-making system in Phase II to revitalize emissions trading and ensure the stable operation of the emissions trading market. Under this system, the government lends emission permits to market makers every month from the reserve for market-making, and market makers are required to propose the asking or bidding price for emission permits in the exchange market and participate in emission permit transactions. In the 2018 and 2019 compliance years, the early stages of the introduction of the market-making system, two financial institutions were designated as market makers. The number of market makers participating in the system then increased to five in the 2020 compliance year, seven in the 2022 compliance year, and eight³⁶⁾ in the 2023 compliance year.

Market makers sold 7.0 Mt and purchased 4.7 Mt of KAU23. Unlike previous compliance years, the amount of KAUs sold by market makers exceeded the amount of KAUs that they purchased. The amount of KAU23 purchased by market makers decreased significantly compared to that of KAU22 (6.7 Mt was sold and 9.6 Mt was purchased).

Between September 2023 and August 2024, during which KAU23 was traded as the primary type of emission permit, the proportion of market-maker trades from the total exchange trading volume for KAU23 (excluding the amount auctioned) was 29.4% for sales and 19.6% for purchases. Considering that the proportion of market-maker trades from the total KAU22 trading volume during the period when KAU22 was traded as the primary type of emission permit (September 2022–August 2023) was 28.2% for sales and 43.1% for purchases, the proportion of market-maker trading in the exchange market has decreased.

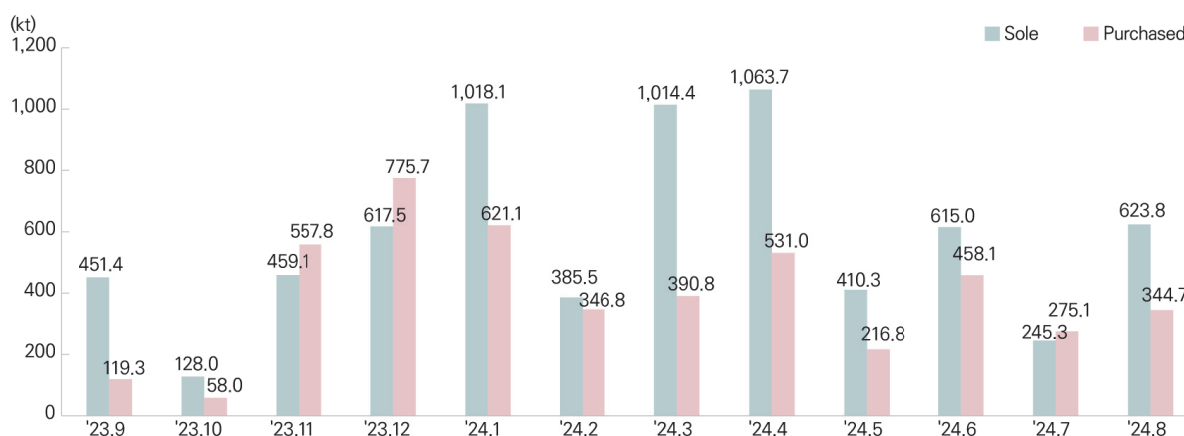
By month, September 2023 recorded the highest share of sales by market makers, accounting for 88.4% (451.4 kt) of the KAU23 trading volume on the exchange (510.8 kt). This was the highest proportion during the analysis period. The largest volume sold by market makers was in January 2024

35) This analysis was conducted based on the trading volume registered in the ETRS. The trading records provided in this section may thus be different from those provided in “2.1. Analysis of the Trading Volume.”

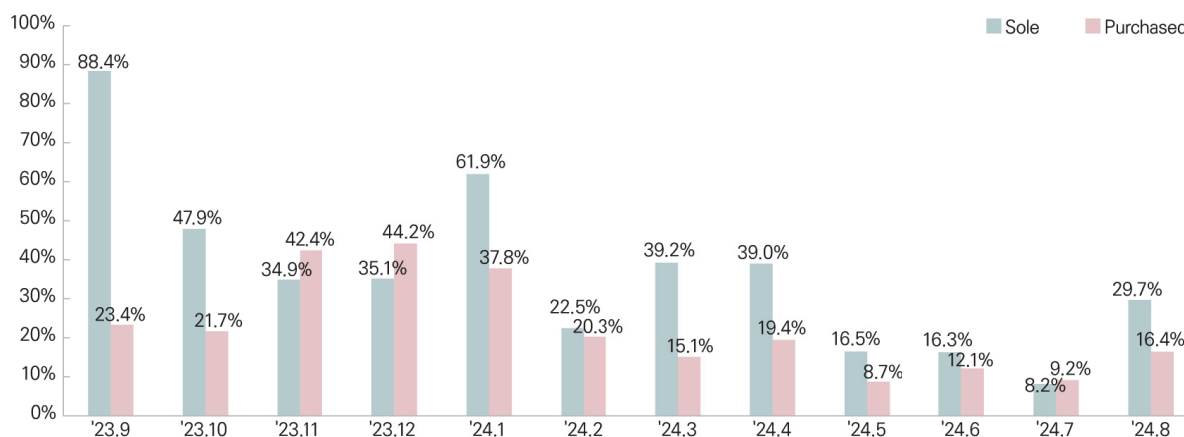
36) Before the 2023 compliance year, the designated market makers included the Korea Development Bank, the Industrial Bank of Korea, Hana Financial Investment, the Korea Investment & Securities, SK Securities, KB Securities, and Shinhan Securities. In the 2023 compliance year, NH Investment & Securities was also designated as a market maker.

at 1,018.1 kt, accounting for 61.9% of the KAU23 trading volume. July 2024 recorded the lowest share of market maker sales in KAU23 trading, with 245.3 kt, or 8.2%, out of a total trading volume of 3,002.5 kt. In October 2023, market makers sold the smallest volume of allowances, at 128.0 kt.

The highest volume of KAU23 purchases by market makers was 775.7 kt (December 2023), which accounted for 44.2% of the total exchange trading volume for KAU23, representing the highest proportion obtained during the analysis period. The purchase volume for KAU23 was 216.8 kt in May 2024, which accounted for 8.7% of the total exchange trading volume for KAU23. This was the lowest proportion obtained during the analysis period. The lowest purchase volume for KAU23 was 58.0 kt, recorded in October 2023.



〈Figure III-13〉 Trading Volume of Market Makers for KAU23



〈Figure II-14〉 Proportion of Market Makers for KAU23 in the Exchange Market

2.6. Analysis of Proprietary Trading by Securities Companies³⁷⁾

After the enactment and enforcement of the relevant notification³⁸⁾ in October 2021, 20 securities companies began to participate in the exchange emissions trading market from December 2021. In the 2023 compliance year, a total of 21 securities companies participated, selling 0.34 Mt and purchasing 0.35 Mt of KAU23. The trading volume for KAU23 has declined compared to KAU22 (0.5 Mt was sold and 2.5 Mt was purchased), and the amount of KAU23 sold was similar to the amount of KAU23 purchased.

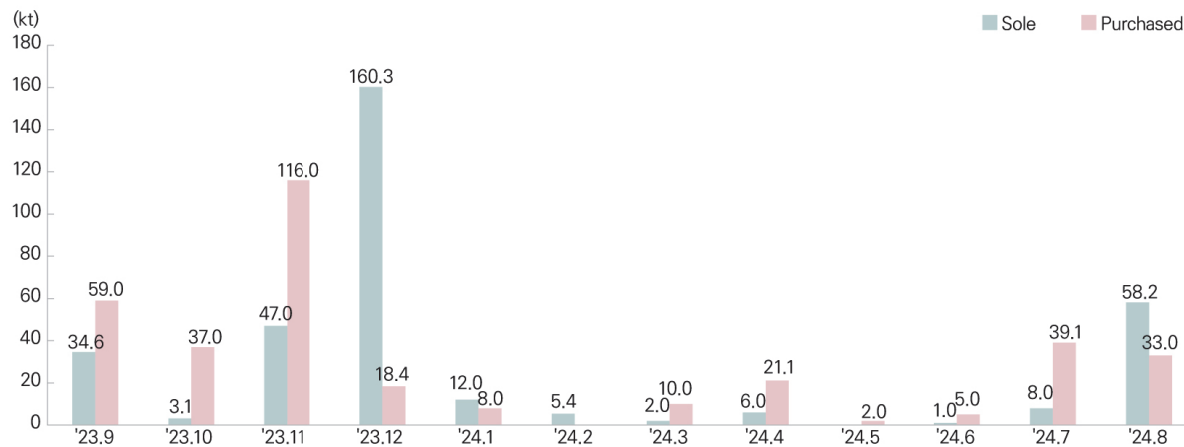
Between September 2023 and August 2024, during which KAU23 was traded as the primary type of emission permit, the proportion of securities company trades from the total exchange trading volume for KAU23 (excluding the amount auctioned) was 1.4% for sales and 1.5% for purchases. Considering that the proportion of securities company trades from the total KAU22 trading volume during the period when KAU22 was traded as the primary type of emission permit (September 2022–August 2023) was 2.1% for sales and 11.5% for purchases, the proportion of securities company trading in the exchange market decreased.

In terms of the monthly trading volume for sales, the amount of KAU23 sold by securities companies in the exchange market between February and June 2024 remained low at no more than 6 kt, and the proportion of KAU23 sold by securities companies from the total sales volume for KAU23 was also low (<0.3%). The amount of KAU23 sold by securities companies reached a record high of 160.3 kt in December 2023, which represented 9.1% of the total exchange trading volume for KAU23.

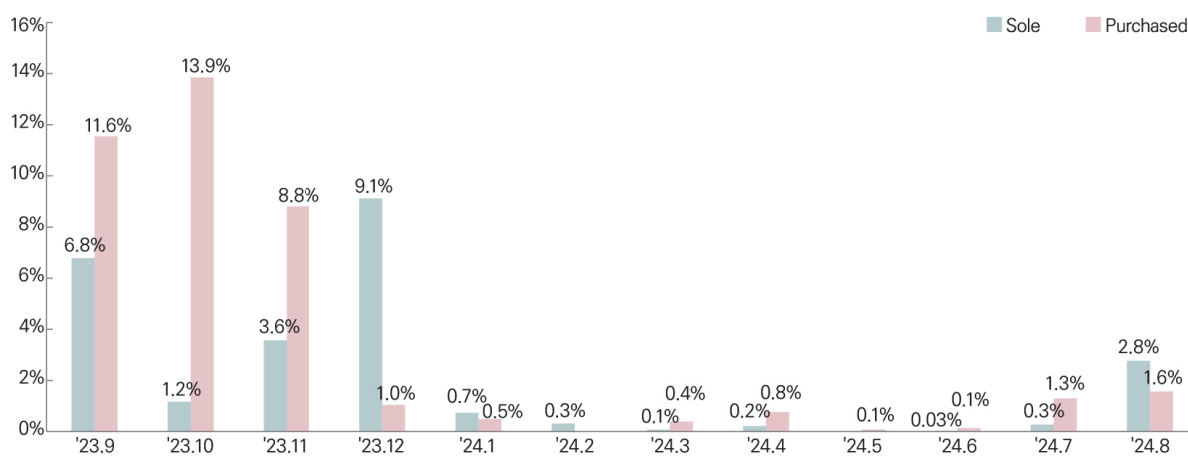
Both purchases and sales of KAU23 were concentrated in the second half of 2023. The amount of KAU23 purchased by securities companies was highest in November 2023 (116.0 kt), which accounted for 8.8% of the total purchase volume for KAU23.

37) This analysis was conducted based on the trading volume registered in the ETRS. The trading records provided in this section may thus be different from those provided in “2.1. Analysis of the Trading Volume.”

38) Notification on Emissions Trade Brokerage Companies (Ministry of Environment Notification No. 2021–203, enacted and entered into force on 19 October 2021).



〈Figure III-15〉 Trading Volume of Securities Companies for KAU23



〈Figure III-16〉 Proportion of Securities Companies for KAU23 in the Exchange Market

IV

Survey

1. Overview of the Survey
2. Views on and Response to the K-ETS
3. GHG Emission Reduction Efforts and Performance

1**Overview of the Survey**

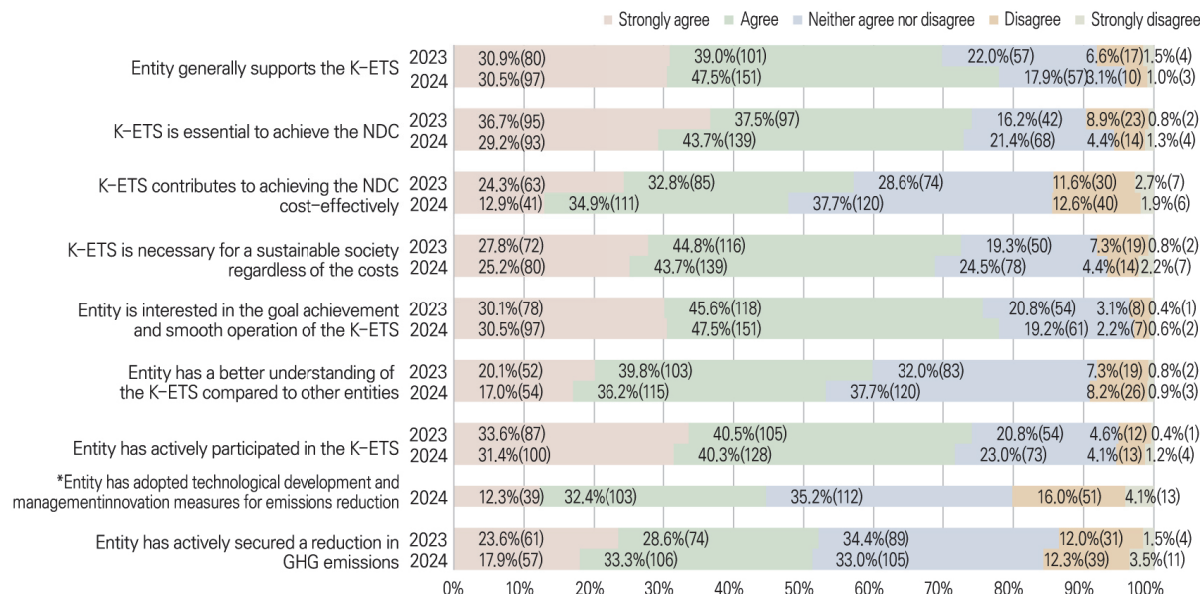
A survey was conducted with covered entities participating in the K-ETS regarding their views of the K-ETS and emissions trading market, the implementation of the K-ETS, the GHG emission reduction efforts and performance, and directions for improving the K-ETS for Phase IV. The survey was conducted for approximately three weeks from 25 September to 14 October 2024 by selecting covered entities that were able to meet their obligation to surrender emission permits for the 2023 compliance year.³⁹⁾ The total number of responses, excluding duplicates, was 318, with a response rate of 43.4%.

³⁹⁾ The survey was conducted by sending a questionnaire and an online survey link via email to the corporate contact of the covered entities. During the survey period, follow-up emails and text messages were sent twice to provide guidance on the survey and encourage participation.

2

Views on and Response to the K-ETS**2.1. Views on the K-ETS**

The views of covered entities on the K-ETS were analyzed. The survey results showed that covered entities were generally supportive of the K-ETS (positive: 78.0%, 248 responses; negative: 4.1%, 13 responses). The proportion of responding entities saying that the K-ETS is necessary to achieve Korea's NDC (positive: 72.9%, 232 responses; negative: 5.7%, 18 responses) and that the K-ETS is necessary for the transition to a sustainable society regardless of the costs of responding to it (positive: 68.9%, 219 responses; negative: 6.6%, 21 responses) was high. In addition, many respondents reported that the K-ETS contributes to achieving GHG reduction targets in a cost-effective manner (positive: 47.8%, 152 responses; negative: 14.5%, 46 responses). The proportion of responding entities saying that they are interested in the successful achievement of the goals and smooth operation of the K-ETS (78.0%, 248 responses) was significantly higher than the proportion of entities who claimed otherwise (2.8%, 9 responses). The responding entities also reported that they have actively participated in emissions trading (positive: 71.7%, 228 responses; negative: 5.3%, 17 responses), adopted technological development and management innovation measures for emissions reduction (positive: 44.7%, 142 responses; negative: 20.1%, 64 responses), and actively secured a reduction in GHG emissions (positive: 51.2%, 163 responses; negative: 15.8%, 50 responses). Of note was that the proportion of respondents responding positively about their participation in emissions trading was higher than the proportion of respondents responding positively about their attempts to secure a reduction in GHG emissions. These results corresponded closely with the results of the previous survey, and for most survey items, the positive response rate exceeded 50%.

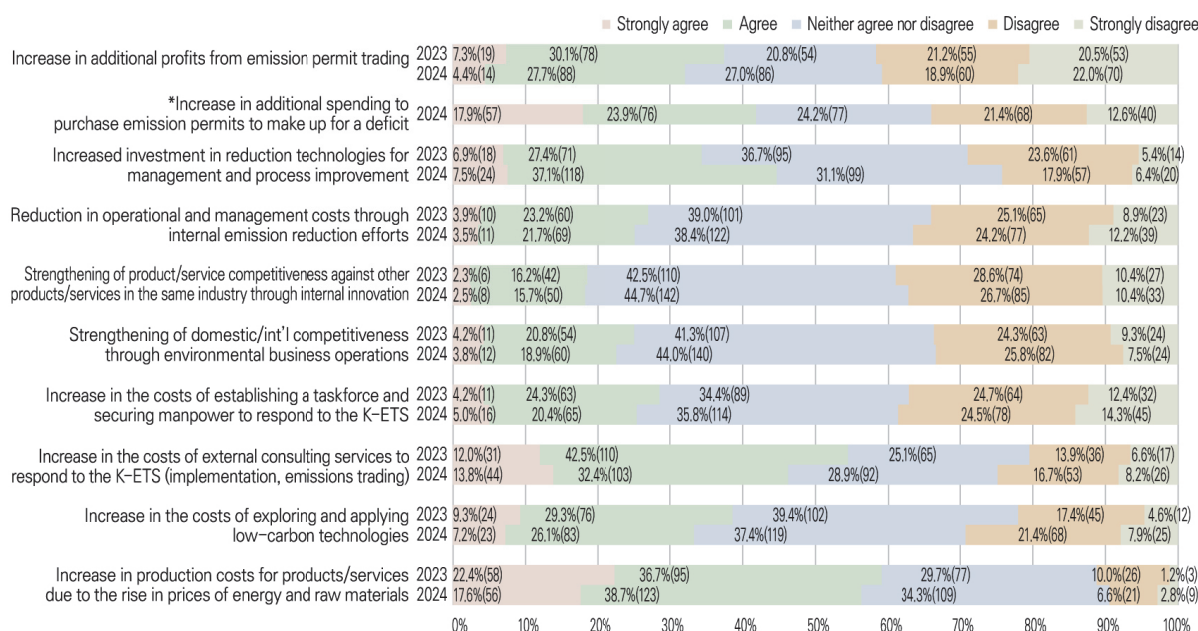


Note: Survey items marked with * have been newly introduced to the present survey.

〈Figure IV-1〉 Overall Views on and Responses to the K-ETS

In order to determine the impact of the K-ETS on the business operations of the covered entities, the extent of their investment in and the costs incurred by their participation in the K-ETS were analyzed. The survey results showed that the proportion of positive responses was higher for an increase in production costs for products/services due to the rise in prices of energy and raw materials (positive: 56.3%, 179 responses; negative: 9.4%, 30 responses), an increase in the costs of external consulting services to respond to the K-ETS (positive: 46.2%, 147 responses; negative: 24.9%, 79 responses), increased investment in reduction technologies for management and process improvement (positive: 44.6%, 142 responses; negative: 24.3%, 77 responses), an increase in the costs of exploring and applying low-carbon technologies (positive: 33.3%, 106 responses; negative: 29.3%, 93 responses), and an increase in the costs of establishing a taskforce and securing manpower to respond to the K-ETS (positive: 25.4%, 81 responses; negative: 38.8%, 123 responses). These results suggest that, despite the management burden caused by reasons such as an increase in production costs for products/services, the covered entities have made efforts to respond to the K-ETS with the application of low-carbon technologies and achieving a reduction in GHG emissions.

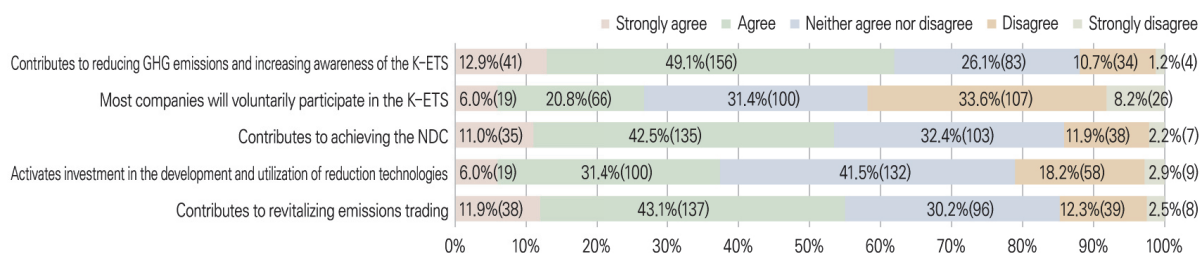
However, it appears that efforts to respond to the K-ETS and reduce GHG emissions have not yet led to a strengthening of corporate competitiveness or an increase in corporate profit. The proportion of negative responses was somewhat higher than that of positive responses regarding all of the following survey items: an increase in additional profits from emission permit trading (positive: 32.1%, 102 responses; negative: 40.9%, 130 responses), a reduction in operational and management costs through internal emission reduction efforts (positive: 25.2%, 80 responses; negative: 36.4%, 116 responses), the strengthening of corporate competitiveness at the domestic/international level through environmental business operations (positive: 22.7%, 72 responses; negative: 33.3%, 106 responses), and the strengthening of product/service competitiveness against other products/services in the same industry through internal innovation (positive: 18.2%, 58 responses; negative: 37.1%, 118 responses).



Note: Survey items marked with * have been newly introduced to the present survey.

◀(Figure IV-2) Impact of the K-ETS on the Business Operations of the Covered Entities

The anticipated impact of the expansion of entities voluntarily participating in the K-ETS⁴⁰⁾ was assessed. The proportion of responding entities saying that this expansion will contribute to reducing GHG emissions and increasing awareness of the K-ETS (62.0%, 197 responses) was higher than the proportion of entities who reported otherwise (11.9%, 38 responses). The responding entities also reported that it will contribute to achieving Korea's NDC (positive: 53.5%, 170 responses; negative: 14.1%, 45 responses) and revitalizing emissions trading (positive: 55.0%, 175 responses; negative: 14.8%, 47 responses). Regarding the activation of investment in the development and utilization of reduction technologies, the proportion of positive responses (37.4%, 119 responses) was slightly higher than that of negative responses (21.1%, 67 responses). However, the proportion of negative responses was higher than that of positive responses for the idea that most companies will voluntarily participate in the K-ETS (positive: 26.8%, 85 responses; negative: 41.8%, 133 responses).



〈Figure IV-3〉 Effect of the Expansion of Voluntary Participation in the K-ETS

The views of the covered entities on the performance of the market-making system⁴¹⁾ and third-party participation in emissions trading,⁴²⁾ which were introduced as measures to enhance the liquidity of the emissions trading market and strengthen market predictability, were examined. A high proportion of neutral responses for most of the survey items indicates that covered entities did not have a clear

40) A plan has been established to expand the scope of entities eligible for voluntary participation in the K-ETS to include entities whose annual average amount of GHG emissions produced during the immediately preceding three years is no less than 3,000 t CO₂eq, provided that they have certified these emission levels and have not violated relevant laws or been subject to administrative fines.

41) The market-making system, introduced in Phase II (2018–2020), is a system in which market makers enter into agreements with the emission permit exchange and are required to propose the asking or bidding price for emission permits and trade emission permits in the exchange market during on-exchange trading days.

42) Third-party emissions trading, introduced in Phase III (2021–2025) is a system that allows participation in the emissions trading market by entities other than covered entities and market makers (i.e., public financial institutions), which include emissions trade brokerage companies.

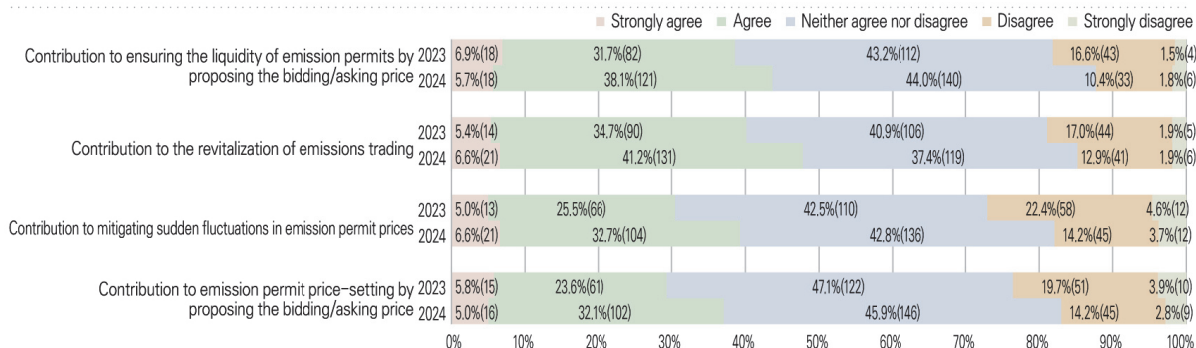
opinion on the performance of these measures. Nevertheless, the responding entities' views on these measures were analyzed, focusing on positive (strongly agree and agree) and negative (strongly disagree and disagree) responses.

Regarding the market impact of the market-making system, the proportion of positive responses was higher to a certain extent than that of negative responses for all survey items. Specifically, the entities responded positively regarding the market-making system's contribution to ensuring the liquidity of emission permits (positive: 43.8%, 139 responses; negative: 12.2%, 39 responses), revitalizing emissions trading (positive: 47.8%, 152 responses; negative: 14.8%, 47 responses), mitigating sudden fluctuations in emission permit prices (positive: 39.3%, 125 responses; negative: 17.9%, 57 responses), and establishing prices by proposing the bidding or asking price (positive: 37.1%, 118 responses; negative: 17.0%, 54 responses). In particular, the proportion of positive responses was highest for the system's contribution to the revitalization of emissions trading, while the proportion of negative responses was highest for its contribution to mitigating sudden fluctuations in emission permit prices. Compared to the results of the previous year's survey, the proportion of positive responses has increased for most survey items and the proportion of negative responses has decreased for all survey items.

Views on the market-making system's contributions were analyzed based on the entity size, and the results were converted into a 100-point scale.⁴³⁾ The results showed that entities of all sizes believed the market-making system has had a more positive impact on ensuring the liquidity of emission permits and revitalizing emissions trading than on mitigating sudden fluctuations in emission permit prices or establishing emission permit prices. In general, large companies gave lower scores (contribution to ensuring the liquidity of emission permits: 56.8 points; revitalizing emissions trading: 56.5 points; mitigating sudden fluctuations in emission permit prices: 53.3 points; establishing prices by proposing the bidding or asking price: 53.0 points), while other entities (public institutions) gave higher scores (contribution to ensuring the liquidity of emission permits: 67.0 points; revitalizing emissions trading: 66.1 points; mitigating sudden fluctuations in emission permit prices: 61.6 points; establishing prices by proposing the bidding or asking price: 67.0 points).

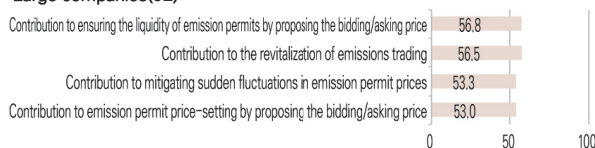
43) A 5-point Likert scale (ranging from strongly agree to strongly disagree) was used in the survey, and the results were converted into a 100-point scale for analysis, with 100 points representing "strongly agree," 75 points representing "agree," 50 points representing "neither agree nor disagree," 25 points representing "disagree," and 0 points representing "strongly disagree."

All respondents

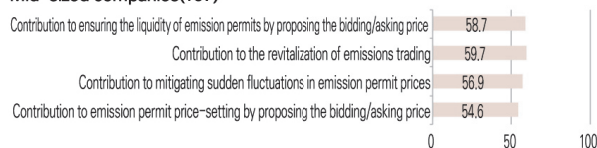


By entity size (on a 100-point scale)

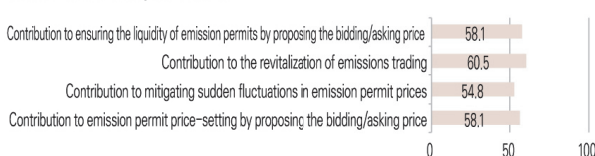
Large companies(92)



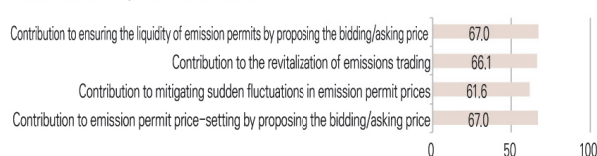
Mid-sized companies(167)



Small-sized companies (31)



Other entities (public institutions)(28)



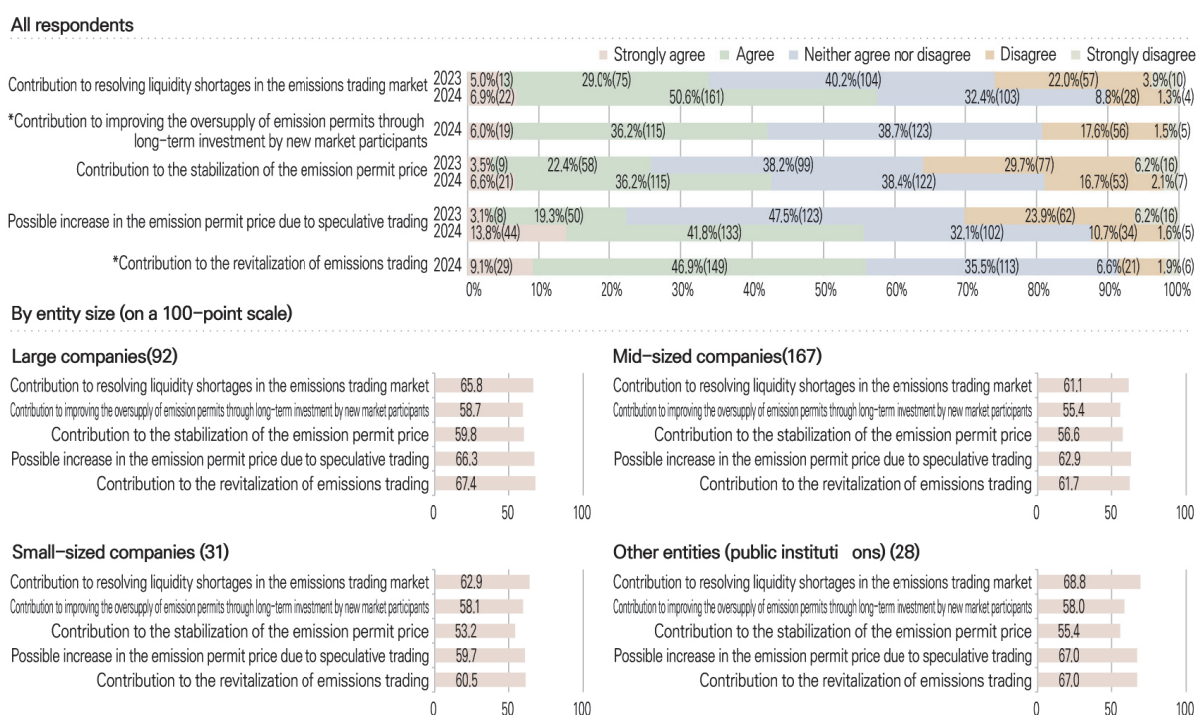
〈Figure IV-4〉 Performance of the Market-Making System

With regard to the impact of third-party trading in terms of improving the liquidity of the market,⁴⁴⁾ the proportion of positive responses (57.5%, 183 responses) was higher than that of negative responses (10.1%, 32 responses). Likewise, the proportion of positive responses for its contribution to stabilizing the emission permit price (42.8%, 136 responses) exceeded that of negative responses (18.8%, 60 responses). The proportion of entities saying that the emission permit price will increase due to speculative trading by third-party participants (55.6%, 177 responses) was higher than the proportion of entities that expected the opposite (12.3%, 39 responses). Compared to the results of the previous year's survey, the positive response rate has increased for all survey items. The findings of the present survey contrasted with those of the previous year's survey, where covered entities were concerned

44) A plan has been devised to expand the scope of market participants to include collective investment entities, trust companies, fund managers, banks, and insurance companies. Market participants are required to trade emission permits in the emissions trading market established by the emission permit exchange, provided that cases in which trading outside this market may be determined and announced by the Minister of Environment.

about the decline in the emission permit price caused by third-party trading. In addition, there were more positive responses than negative ones for the two survey items newly introduced to the present survey: contribution of third-party trading to improving the oversupply of emission permits (positive: 42.2%, 134 responses; negative: 19.1%, 61 responses) and revitalizing emissions trading (positive: 56.0%, 178 responses; 8.5%, 27 responses).

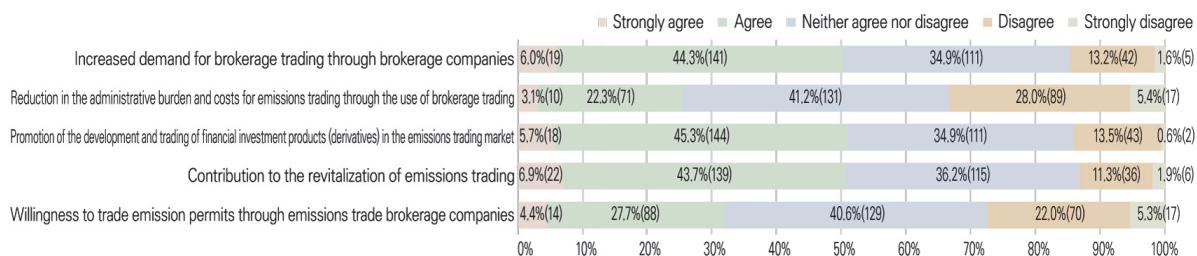
Views on the contribution of third-party trading were analyzed based on the entity size, with the results converted to a 100-point scale. The results showed that entities of all sizes believed third-party trading had a more positive impact on resolving the problem of liquidity shortages in the emissions trading market than stabilizing the emission permit price. For the contribution of third-party trading to resolving liquidity shortages in the emissions trading market, other entities (public institutions) gave the highest score (68.8 points), while mid-sized companies gave the lowest score (61.1 points). In terms of the contribution to stabilizing the emission permit price, large companies gave the highest score (59.8 points), while small-sized companies gave the lowest score (53.2 points).



Note: Survey items marked with * have been newly introduced to the present survey.

〈Figure IV-5〉 Performance of Third-Party Trading

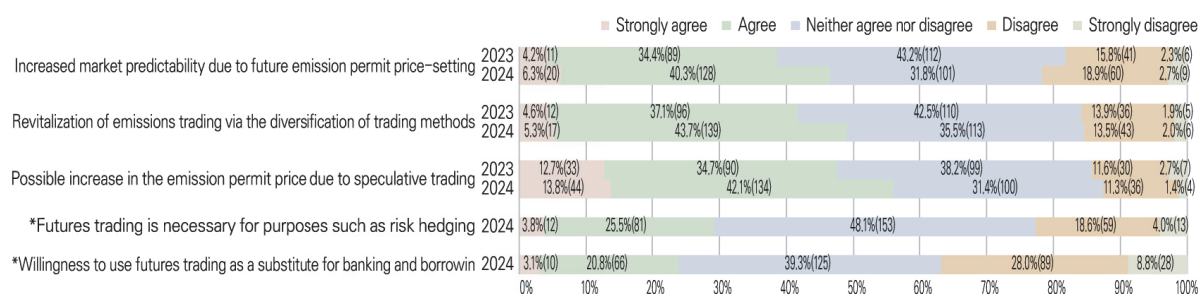
The views of covered entities on the introduction of brokerage-based emission permit trading were examined. The survey results showed that the proportion of responding entities saying that the introduction of brokerage trading⁴⁵⁾ will lead to an increase in the demand for brokerage services (50.3%, 160 responses) was higher than the proportion of entities that expected the opposite (14.8%, 47 responses). Moreover, the proportion of positive responses was higher than that of negative responses for the belief that brokerage trading will promote the development and trading of financial investment products (derivatives) in the emissions trading market (positive: 51.0%, 162 responses; negative: 14.1%, 45 responses) and will contribute to the revitalization of emissions trading (positive: 50.6%, 161 responses; negative: 13.2%, 42 responses). While the proportion of responding entities expressing a willingness to trade emission permits through emissions trade brokerage companies (32.1%, 102 responses) was slightly higher than the proportion of entities who claimed otherwise (27.3%, 87 responses), the proportion of responding entities saying that the use of brokerage trading will not reduce administrative burden and costs (33.4%, 106 responses) was higher than the proportion of entities saying the opposite (25.4%, 81 responses).



〈Figure IV-6〉 Effect of the Introduction of Brokerage-Based Emission Permit Trading

45) Brokerage-based emission permit trading is a system designed to establish an advanced emissions trading market framework comparable to that of a financial market by setting the conditions for the brokerage trading of emission permits by market participants. Under this system, emission permits are traded by emissions trade brokerage companies, such as collective investment entities, trust companies, fund managers, banks, and insurance companies.

In addition, the views of covered entities on on-exchange futures trading were surveyed. Regarding the impact of a fully established futures trading system⁴⁶⁾ on the emissions trading market, the proportion of respondents saying that it will contribute to an increase in market predictability (positive: 46.6%, 148 responses; negative: 21.6%, 69 responses) and to the revitalization of emissions trading (positive: 49.0%, 156 responses; negative: 15.5%, 49 responses) was higher than the proportion of respondents who claimed otherwise. On the other hand, it was found that the level of concern about an increase in the emission permit price due to the possibility of speculative trading was also high (positive: 55.9%, 178 responses; negative: 12.7%, 40 responses). Regarding the survey items newly introduced to the present survey, the proportion of positive responses was slightly higher than that of negative responses for the idea that futures trading is necessary for purposes such as risk hedging (positive: 29.3%, 93 responses; 22.6%, 72 responses), while the opposite was true for the response that the entity will use futures trading as a substitute for the banking and borrowing of emission permits (positive: 23.9%, 76 responses; negative: 36.8%, 117 responses). Compared to the results of the previous year's survey, the proportion of positive responses has increased for the contribution of futures trading to an increase in market predictability, while the positive responses has increased and negative responses has decreased for the contribution of futures trading to the revitalization of on-exchange emissions trading and a possible increase in the emission permit price.

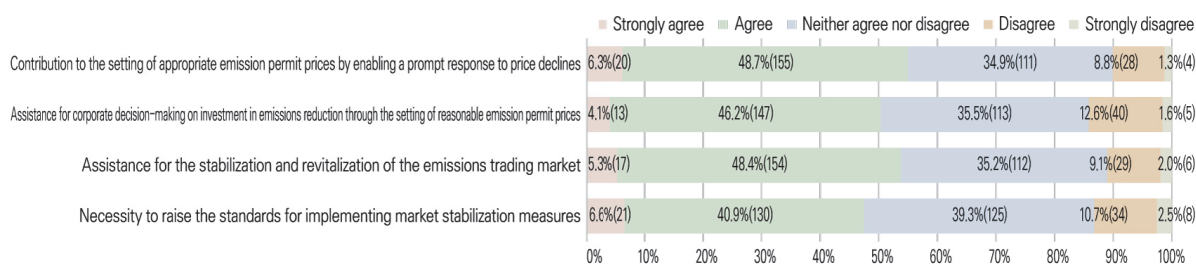


Note: Survey items marked with * have been newly introduced to the present survey.

〈Figure IV-7〉 Expected Effect of the Introduction of an On-Exchange Futures Trading System

46) In futures trading of emission permits, an agreement is concluded to buy or sell emission permits at a predetermined price at a future date. During Phase II, only spot trading was allowed for emission permit trades in the exchange market. However, on-exchange futures trading is planned to be introduced in Phase III (2021–2025).

Regarding the impact of improving the standards for implementing market stabilization measures⁴⁷⁾ on the K-ETS, the proportion of positive responses was higher than that of negative responses for all survey items. Specifically, the entities responded positively regarding the measure's contribution to the setting of appropriate emission permit prices by enabling a prompt response to price declines (positive: 55.0%, 175 responses; negative: 10.1%, 32 responses), assistance for corporate decision-making on investment in emissions reduction through the setting of reasonable emission permit prices (positive: 50.3%, 160 responses; negative: 14.2%, 45 responses), and assistance for the stabilization and revitalization of the emissions trading market (positive: 53.7%, 171 responses; negative: 11.1%, 35 responses). The entities also responded positively regarding the necessity to raise the standards for implementing market stabilization measures (positive: 47.5%, 151 responses; negative: 13.2%, 42 responses).



Note: Survey items marked with * have been newly introduced to the present survey.

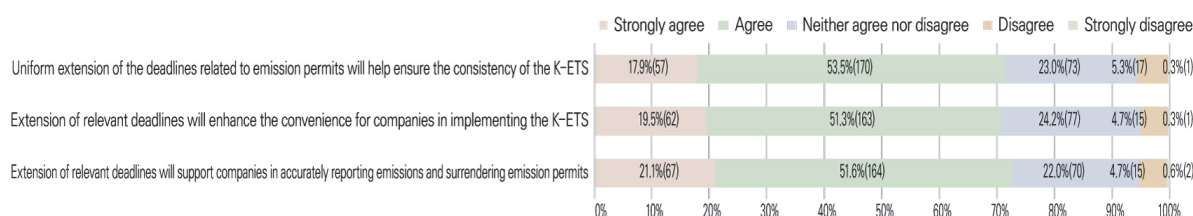
〈Figure IV-8〉 Effect of Improving the Standards for Implementing Market Stabilization Measures

Regarding the impact of the extension of the deadlines for the reporting and verification of changes in emission permits and the surrender of emission permits,⁴⁸⁾ the proportion of positive responses was higher than that of negative responses for all survey items. Specifically, the entities reported that the uniform extension of the deadlines related to emission permits will help ensure the K-ETS' consistency

47) The implementation standards will be revised from "if the average price of emission permits in the previous month does not exceed 60% of the average price in the immediately preceding two years" to "if the average price of emission permits in the previous month does not exceed 70% of the average price in the recent two years."

48) In order to alleviate the administrative burden on covered entities, the deadline for reporting changes to their emissions reports will be extended from 15 days to 30 days. Additionally, the deadlines for submitting a report on the surrender of emission permits, an application for the banking and borrowing of emission permits, and the validity period of KCUs are all planned to be uniformly extended to within eight months from the end of the compliance year.

(positive: 71.4%, 227 responses; negative: 5.6%, 18 responses) and that the extension of relevant deadlines will enhance the convenience for companies in implementing the K-ETS (positive: 70.8%, 225 responses; negative: 5.0%, 16 responses) and support companies to accurately report emissions and surrender emission permits (positive: 72.7%, 231 responses; negative: 5.3%, 17 responses).

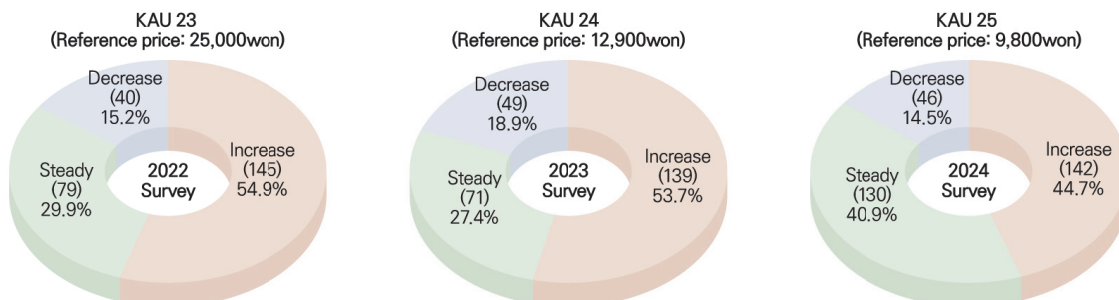


〈Figure IV-9〉 Effect of the Extension of the Deadline for the Surrender of Emission Permits

In terms of forecasting the price for KAUs in 2025, with reference to the closing price for KAU24 on 24 September 2024 (9,800 won), the highest proportion of the responding entities expected an increase (44.7%, 142 responses), followed by a steady price (40.9%, 130 responses) and a decrease (14.5%, 46 responses). This corresponds closely with the results of previous surveys. However, of note is that the number of entities anticipating an increase has declined since 2022. Considering that the reference price used for each survey gradually decreased from 28,500 won in 2021 (KAU22) to 25,000 won in 2022 (KAU23), 12,900 won in 2023 (KAU24), and to 9,800 won in this survey (KAU25), the entities' perception that the price of emission permits will increase has eased.

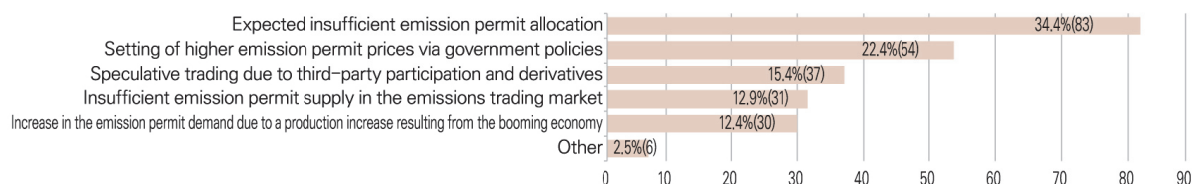
The main reasons for expecting an increase in emission permit prices were an expected insufficient emission permit allocation (34.4%, 83 responses) and the setting of higher emission permit prices via government policies (22.4%, 54 responses). The reasons for expecting steady emission permit prices were a stagnant economy (32.3%, 71 responses) and a steady trading volume in the emissions trading market (31.4%, 69 responses). In addition, the reasons for expecting a decrease in emission permit prices were a decrease in the demand for emission permits due to a decrease in production as a result of an economic downturn (54.2%, 39 responses), which accounted for the highest proportion of responses, followed by an increase in emission permit allocations, including additional allocations and auctions (16.7%, 12 responses).

Forecasts for emission permit prices

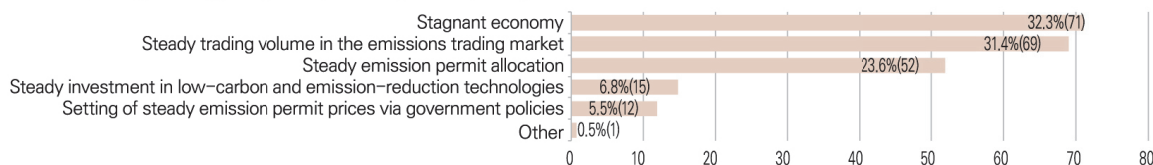


Reasons for price forecasts (up to two responses allowed)

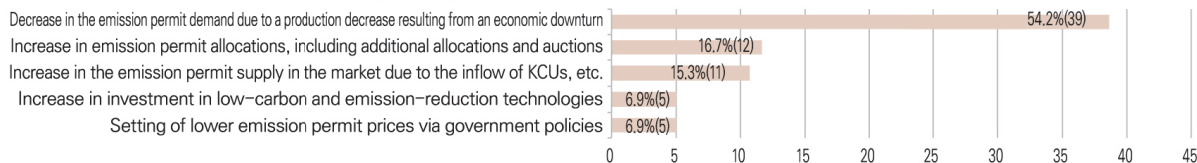
Reasons for expecting a price increase (142 respondents, 241 responses)



Reasons for expecting a steady price (130 respondents, 220 responses)



Reasons for expecting a price decrease (46 respondents, 72 responses)



〈Figure IV-10〉 Forecasts for the Trading Price of Emission Permits

2.2. Response to the K-ETS

Regarding the positions held by employees within covered entities who have the authority to make decisions regarding the K-ETS, the largest proportion were the highest decision-makers (36.2%, 115 responses), followed by those holding an executive-level position (32.7%, 104 responses), deputy section heads or general employees (11.0%, 35 responses), department heads (10.7%, 34 responses), and section heads or deputy department heads (9.4%, 30 responses). This indicates that those holding a department head position or higher (79.6%, 253 responses) tend to make decisions regarding how their affiliated entity should respond to the K-ETS.

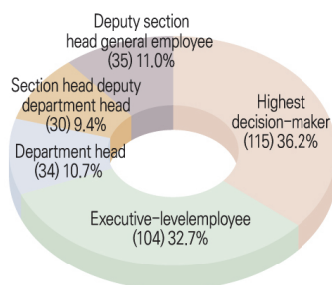
In terms of the most preferred strategy to comply with the obligation to surrender emission permits, these decision-makers chose the banking of emission permits (124 responses), internal emission reduction activities (102 responses), and the purchase of emission permits (75 responses). In terms of the three most preferred strategies, the decision-makers chose internal emission reduction activities (267 responses), the purchase of emission permits (264 responses), and the banking of emission permits (252 responses). Of note was that the number of decision-makers who chose to secure a reduction in emissions through participation in external projects (114 responses) has increased.

Broken down by entity size, while large (banking of emission permits: 42 responses; internal emission reduction activities: 27 responses) and mid-sized companies (banking of emission permits: 67 responses; internal emission reduction activities: 56 responses) chose internal emission reduction activities and banking of emission permits as the most preferred strategy, small-sized companies (internal emission reduction activities: 11 responses; purchase of emission permits: 10 responses) and other entities (public institutions) (purchase of emission permits: 12 responses; internal emission reduction activities: 8 responses) chose internal emission reduction activities and the purchase of emission permits.

In terms of the three most preferred strategies, large companies preferred internal emission reduction activities (82 responses) and the banking of emission permits (76 responses), while mid-sized companies (internal emission reduction activities: 140 responses; purchase of emission permits: 138 responses) and other entities (public institutions) (purchase of emission permits: 27 responses; internal emission reduction activities: 20 responses) preferred internal emission reduction activities and the purchase of emission permits. Small-sized companies preferred the banking of emission permits (27

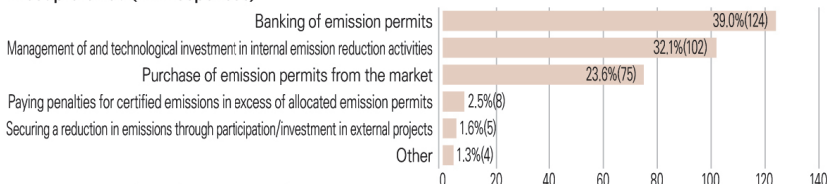
responses), internal emission reduction activities (25 responses), and the purchase of emission permits (25 responses).

Positions of K-ETS decision-makers

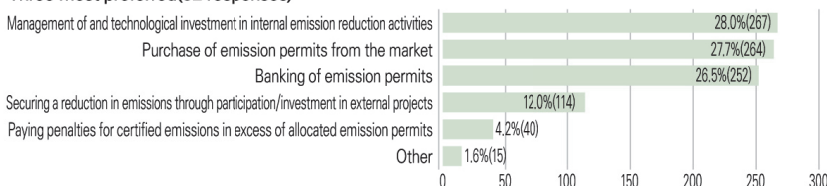


Strategies to comply with the obligation to surrender emission permits

Most preferred (318 responses)

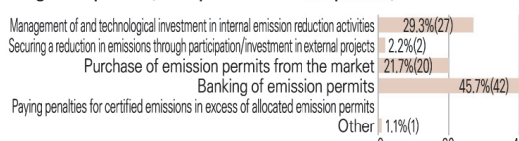


Three most preferred (52 responses)

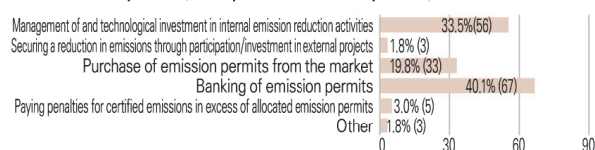


By entity size

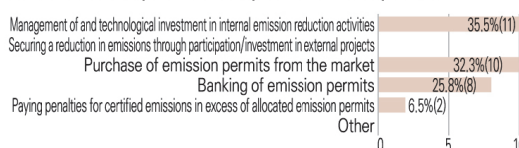
Large companies (Most preferred : 92 responses)



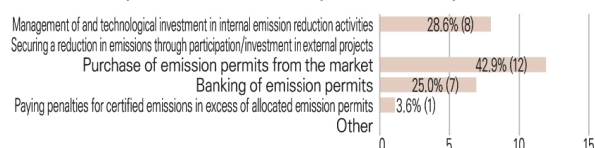
Mid-sized companies (Most preferred : 167 responses)



Small-sized companies (Most preferred : 31 responses)

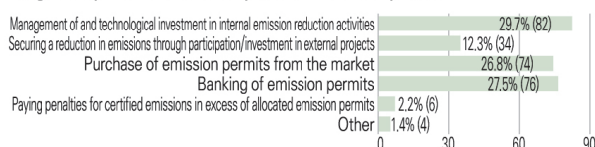


Other entities (public institutions) (Most preferred : 28 responses)

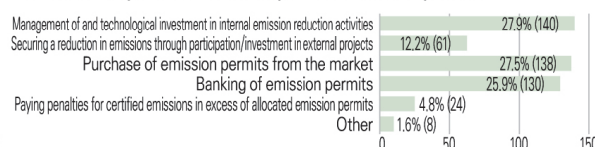


By sector

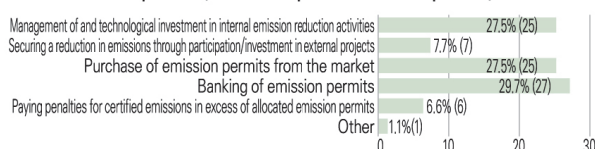
Large companies (three most preferred : 276 responses)



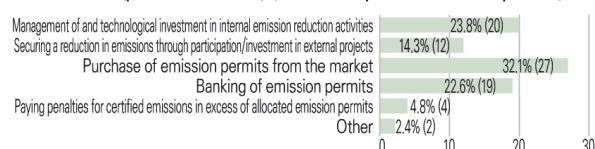
Mid-sized companies (three most preferred : 501 responses)



Small-sized companies (three most preferred : 91 responses)

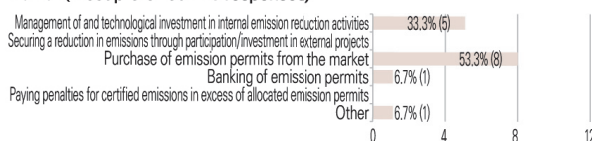
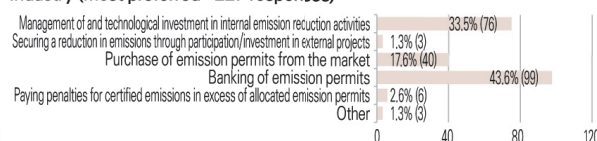
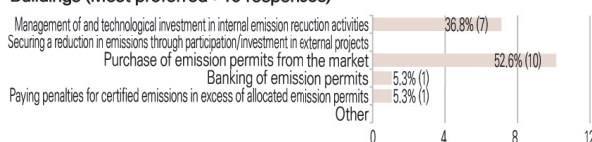
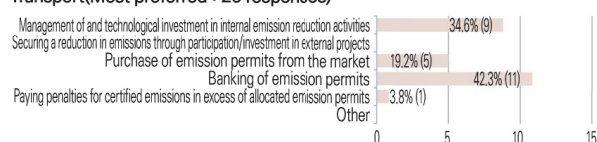
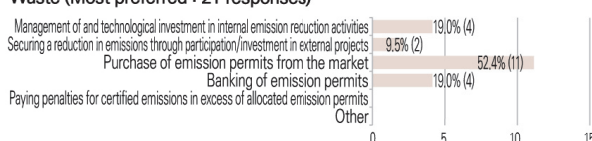
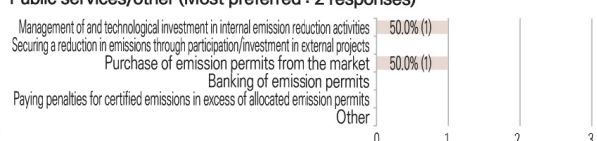
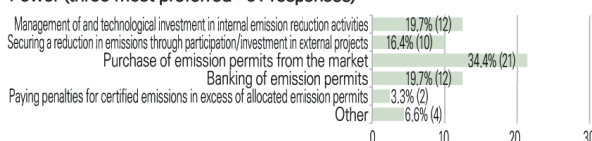
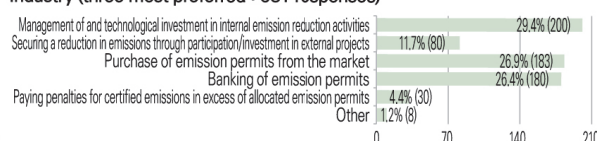
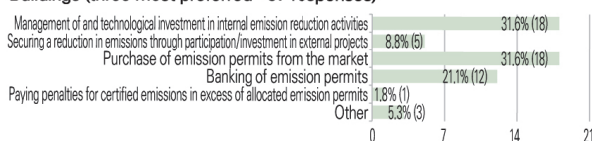
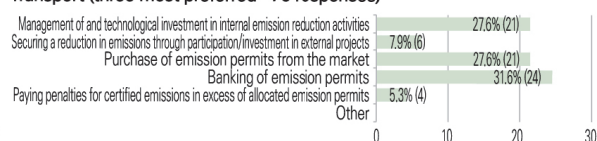
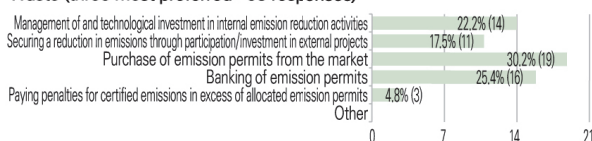
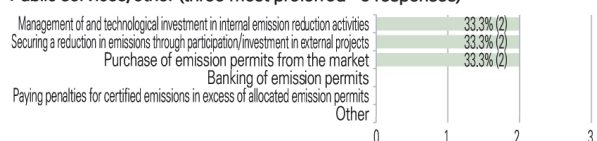


Other entities (public institutions) (three most preferred : 84 responses)



〈Figure IV-11〉 Strategies Preferred by Decision-Makers to Comply with the Obligation to Surrender Emission Permits

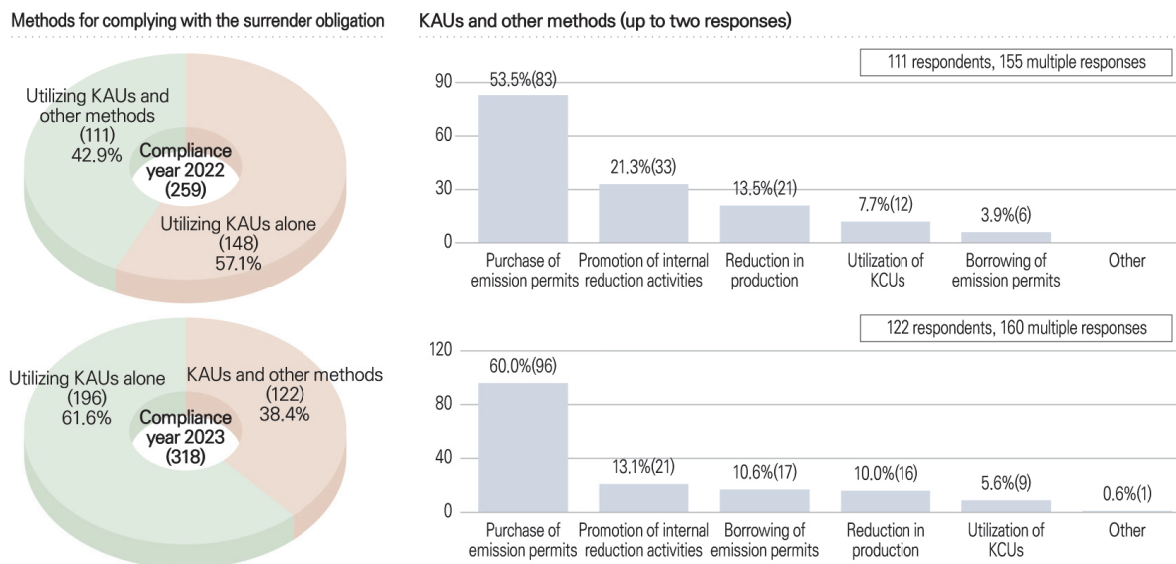
By sector

Power (Most preferred : 15 responses)**Industry (Most preferred : 227 responses)****Buildings (Most preferred : 19 responses)****Transport (Most preferred : 26 responses)****Waste (Most preferred : 21 responses)****Public services/other (Most preferred : 2 responses)****Power (three most preferred : 61 responses)****Industry (three most preferred : 681 responses)****Buildings (three most preferred : 57 responses)****Transport (three most preferred : 76 responses)****Waste (three most preferred : 63 responses)****Public services/other (three most preferred : 6 responses)**

(Figure IV–12) Strategies Preferred by Decision-Makers to Comply with the Obligation to Surrender Emission Permits

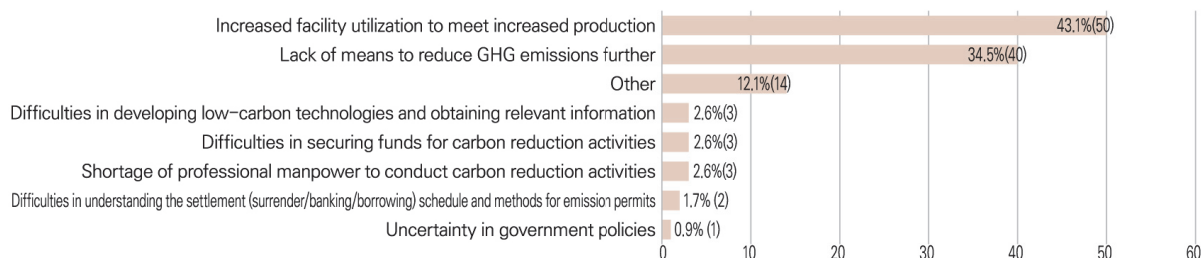
With regard to the methods used by covered entities to surrender emission permits in the third compliance year of Phase III, 61.6% of covered entities (196 responses) reported that they were able to meet their obligation to surrender emission permits using KAUs alone, which was somewhat higher than the proportion of entities that responded that they met their obligation using other methods (38.4%, 122 responses). Compared to the results of the surveys regarding the methods used by covered entities to surrender emission permits for Phase II, the proportion of entities reporting that they met their obligation using KAUs alone has increased, and the methods they used to meet the obligation were similar to those used for the 2022 compliance year.

Regarding methods other than using KAUs employed by covered entities to comply with the obligation to surrender emission permits, the purchase of emission permits was the most commonly used method (60.0%, 96 responses), followed by the promotion of technological investment and internal emission reduction activities (13.1%, 21 responses) and the borrowing of emission permits (10.6%, 17 responses). It was found that the two most widely used additional methods remained unchanged from the results of the previous year's survey. Of particular note was that an overwhelming number of respondents chose the purchase of emission permits as the most commonly used method for two consecutive years. This finding differs from the results of the surveys conducted during Phase II, where the highest response rate was observed for the promotion of internal emission reduction activities.



〈Figure IV-13〉 Methods for Complying with the Surrender Obligation

When asked to select up to two reasons for the emission of GHGs in excess of the amount of emission permits allocated to them, an overwhelming majority of the responding entities that reported they had used additional methods other than using KAUs chose increased facility utilization to meet increased production (43.1%, 50 responses) and the lack of means to reduce GHG emissions further (34.5%, 40 responses). Other reasons included other (12.1%, 14 responses), difficulties in developing low-carbon technologies and obtaining relevant information (2.6%, 3 responses), difficulties in securing funds for carbon reduction activities (2.6%, 3 responses), a shortage of professional manpower to conduct carbon reduction activities (2.6%, 3 responses), difficulties in understanding the settlement schedule and methods for emission permits (1.7%, 2 responses), and uncertainty in government policies (0.9%, 1 response).



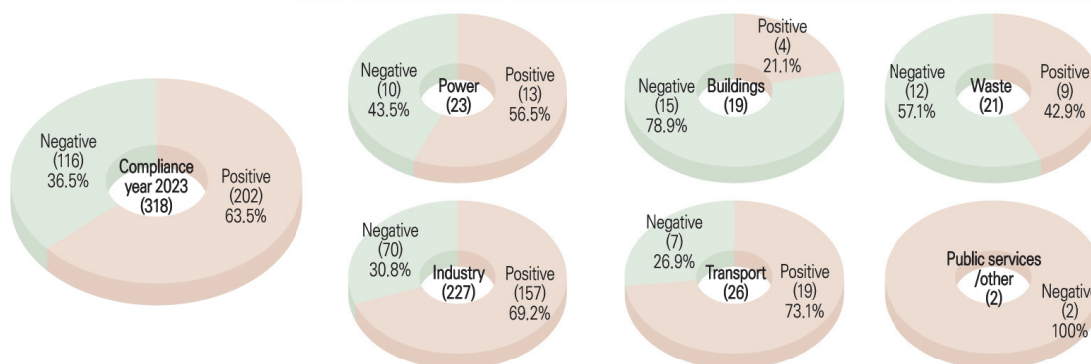
〈Figure IV-14〉 Reasons for Emissions Exceeding Allocated Emission Permits

In the 2023 compliance year, 63.5% of the responding entities (202 responses) reported that they had surplus emission permits and 36.5% (116 responses) reported the opposite, indicating that the number of entities with surplus emission permits outnumbered the number of entities that did not. Broken down by sector, the proportion of entities that had surplus emission permits was higher than the proportion of entities that reported otherwise for power (positive: 56.5%, 13 responses; negative: 43.5%, 10 responses), industry (positive: 69.2%, 157 responses; negative: 30.8%, 70 responses), and transport (positive: 73.1%, 19 responses; negative: 26.9%, 7 response), while the opposite was true for buildings (positive: 21.1%, 4 responses; negative: 78.9%, 15 responses), waste (positive: 42.9%, 9 responses; negative: 57.1%, 12 responses), and public services/other (negative: 100.0%, 2 responses).

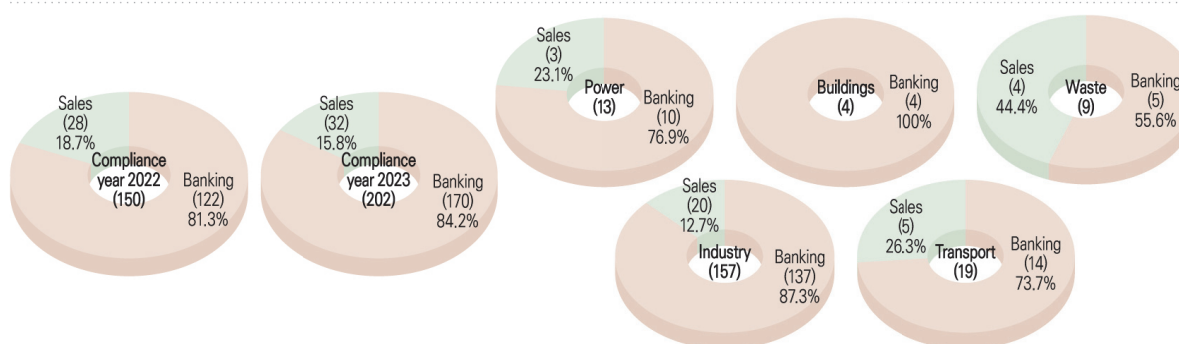
It was found that the tendency of decision-makers to favor the banking of emission permits as a means to secure these permits has affected the methods for dealing with surplus emission permits. In the 2023 compliance year, of the entities that reported having surplus emission permits (202 responses), 84.2% (170 responses) reported that carrying the permits over to the next compliance year was their primary option, while 15.8% (32 responses) stated that the sale of these permits in the exchange or OTC market was their primary option, indicating an overwhelming preference for the banking of surplus emission permits. This finding is in alignment with the fact that there were far more entities that preferred the banking of surplus emission permits (81.3%, 122 responses) than those who preferred the sale of these permits (18.7%, 28 responses) in the 2022 compliance year.

Broken down by sector, entities from all sectors preferred to bank surplus emission permits (power: 76.9%, 10 responses; industry: 87.3%, 137 responses; buildings: 100.0%, 4 responses; transport: 73.7%, 14 responses; waste: 55.6%, 5 responses).

Preference of surplus emission permits



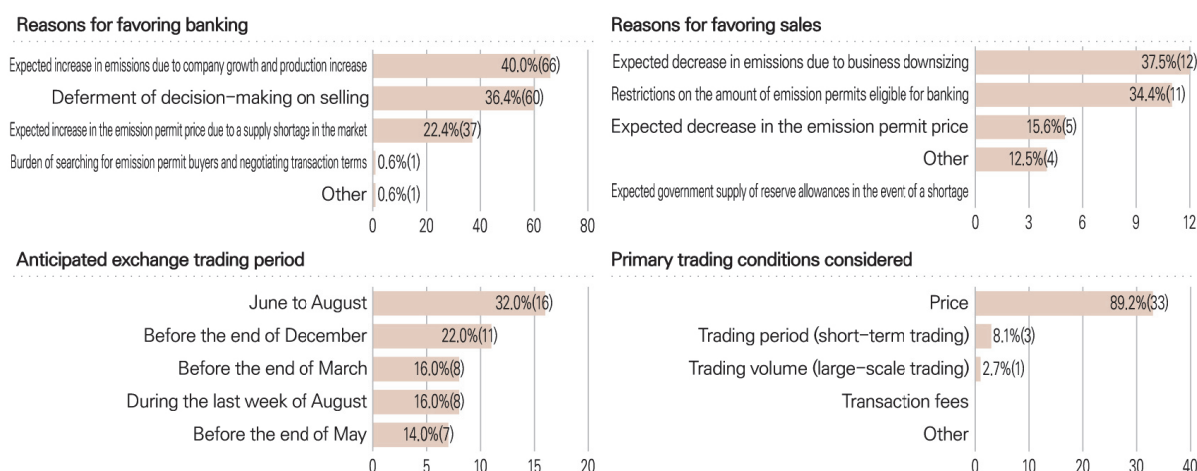
Methods for dealing with surplus emission permits



〈Figure IV-15〉 Methods for Dealing with Surplus Emission Permits

The reasons for favoring the banking of surplus emission permits over their sale in the exchange or OTC market included an expected increase in emissions due to the growth of the company and an increase in production (40.0%, 66 responses), the deferment of decision-making on selling due to uncertainty regarding the market and policy (36.4%, 60 responses), and an expected increase in the emission permit price due to a supply shortage of permits on the market (22.4%, 37 responses). The reasons for favoring the sale of surplus emission permits in the exchange or OTC market over the banking of these permits included an expected decrease in emissions due to business downsizing (37.5%, 12 responses), restrictions on the amount of emission permits eligible for banking (34.4%, 11 responses), and an expected decrease in the emission permit price (15.6%, 5 responses). Regarding the anticipated exchange trading period for surplus emission permits, June to August attracted the highest proportion of responses (32.0%, 16 responses), followed by before the end of December (22.0%, 11 responses), before the end of March (16.0%, 8 responses), during the last week of August (16.0%, 8

responses), and before the end of May (14.0%, 7 responses). Regarding the primary conditions considered in the exchange or OTC trading of surplus emission permits, an overwhelming number of respondents chose price as the most important factor (89.2%, 33 responses), followed by trading period (short-term trading) (8.1%, 3 responses) and trading volume (large-scale trading) (2.7%, 1 response).



〈Figure IV-16〉 Reasons for Choosing the Methods for Dealing with Surplus Emission Permits

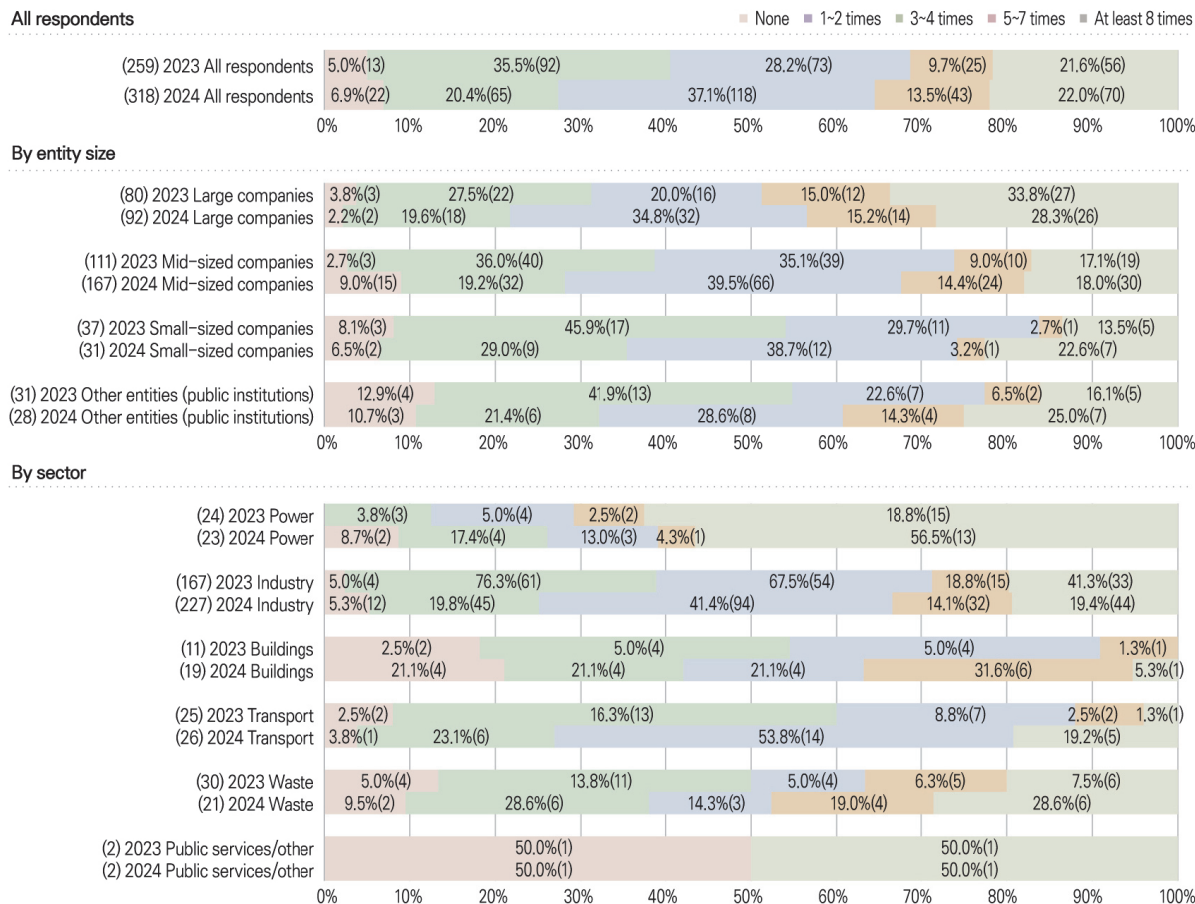
In the 2023 compliance year, 22 responding entities (6.9%) reported that they had not engaged in emissions trading, the proportion of which was similar to that from the previous year's survey. Broken down by entity size, 10.7% (3 responses) of other entities (public institution) reported that they had not engaged in emissions trading, followed by mid-sized companies (9.0%, 15 responses), small-sized companies (6.5%, 2 responses), and large companies (2.2%, 2 responses). Of note was that, except for mid-sized companies, the proportion of entities not having engaged in emissions trading has slightly increased compared to the results of the previous year's survey. Broken down by sector, the proportion of entities that had not engaged in emissions trading was highest for the public services/other sector (50.0%, 1 response), followed by buildings (21.1%, 4 responses), waste (9.5%, 2 responses), power (8.7%, 2 responses), industry (5.3%, 12 responses), and transport (3.8%, 1 response). The proportion of entities that had not engaged in emissions trading has increased compared to the previous year in the power, industry, and buildings sectors.

In the 2023 compliance year, 37.1% of the responding entities (118 responses) reported that they had engaged in emissions trading 3–4 times, while 22.0% (70 responses) had engaged in trading at least 8 times, 20.4% (65 responses) 1–2 times, 13.5% (43 responses) 5–7 times, and 6.9% (22 responses) 0 times. The proportion of entities that had engaged in emissions trading at least 3 times (72.6%, 231 responses), 5 times (35.5%, 113 responses), and 8 times (22.0%, 70 responses) has all increased, indicating an overall increase in the frequency of emission permit transactions.

In terms of entity size, engagement in emissions trading 3–4 times accounted for the highest proportion of responses for entities of all sizes (large companies: 34.8%, 32 responses; mid-sized companies: 39.5%, 66 responses; small-sized companies: 38.7%, 12 responses; other entities (public institutions): 28.6%, 8 responses).

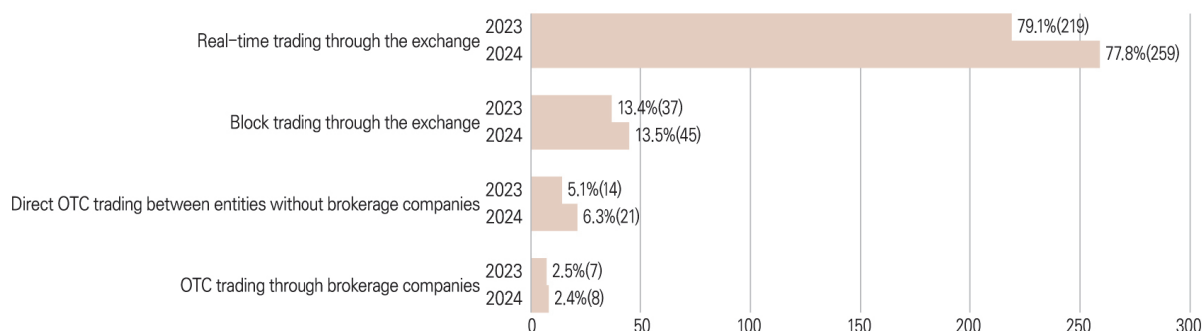
Compared to the previous year, the proportion of entities that had engaged in emissions trading at least 3 times has increased for entities of all sizes, with large companies showing the highest response rate (78.3%, 72 responses), followed by mid-sized companies (71.9%, 120 responses), other entities (public institutions) (67.9%, 19 responses), and small-sized companies (64.5%, 20 responses).

Broken down by sector, the number of entities that had engaged in emissions trading at least 8 times accounted for the highest proportion of responses in the power sector (56.5%, 13 responses), while the number of entities that had engaged in emissions trading 3–4 times accounted for the highest proportion of responses in the industry (41.4%, 94 responses) and transport (53.8%, 14 responses) sectors. In the buildings sector, the number of entities that had engaged in emissions trading 5–7 times accounted for the highest proportion of responses (31.6%, 6 responses). In the waste sector, the response rates for 1–2 times and at least 8 times were the same (28.6%, 6 responses), and in the public sectors/other sector, the response rate was the same for 0 times and at least 8 times (50.0%, 1 response). Compared to the previous year, the proportion of entities that had engaged in emissions trading at least 3 times has increased for the industry, buildings, transport, and waste sectors, while it has decreased for the power sector. In the industry sector, the proportion of entities that had engaged in emissions trading at least 3 and 5 times reached 74.9% (170 responses) and 33.5% (76 responses), respectively.



〈Figure IV-17〉 Participation in Emissions Trading

In terms of the methods for the trading of emission permits used primarily by 296 entities that had participated in emissions trading in the 2023 compliance year, a large proportion of entities stated that they traded emission permits via real-time trading through the exchange (77.8%, 259 responses), followed by those who reported that they used block trading through the exchange (13.5%, 45 responses), direct OTC trading between entities without brokerage companies (6.3%, 21 responses), and OTC trading through brokerage companies (2.4%, 8 responses). This corresponds closely with the results of the previous survey, where the number of entities reporting that they traded emission permits via real-time trading through the emission permit exchange accounted for the highest proportion of responses.

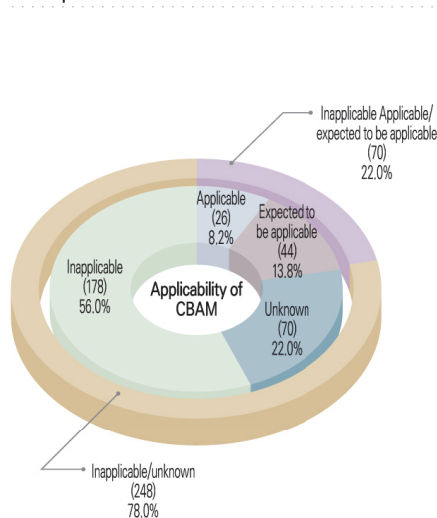


〈Figure IV-18〉 Methods for Trading Emission Permits in Phase III

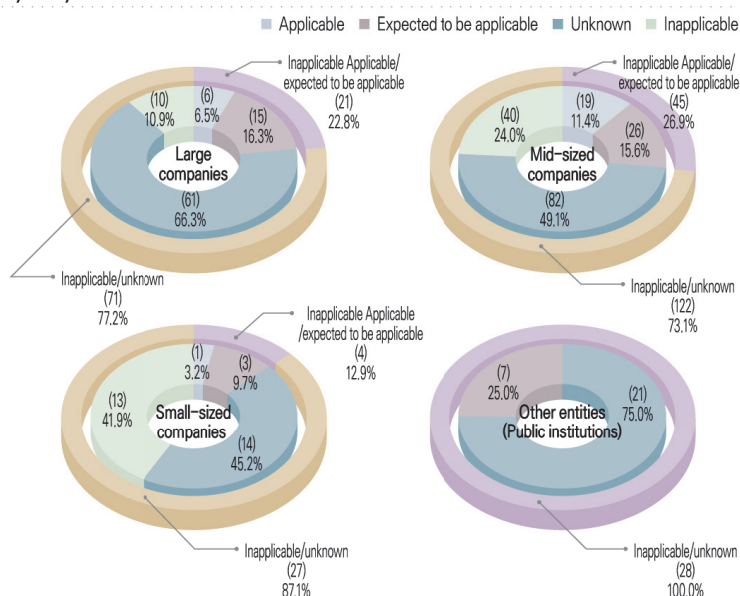
Meanwhile, the applicability of the EU CBAM to covered entities was examined. The survey results showed that 56.0% of the responding entities reported that it is inapplicable (178 responses), followed by those saying that its applicability is unknown (22.0%, 70 responses), it is expected to be applicable in the future (13.8%, 44 responses), and it is applicable (8.2%, 26 responses). The combined response rate for applicable and expected to be applicable was 22.0% (70 responses). Broken down by entity size, the proportion of responding entities saying that the CBAM is applicable and expected to be applicable was 22.8% for large companies (21 responses), 26.9% for mid-sized companies (45 responses), 12.9% for small-sized companies (4 responses), and 0% for other entities (public institutions).

Regarding the proportion of exports to the EU, the response rate was the highest for 10% or more but less than 30% (35.7%, 25 responses), followed by 0% or more but less than 10% (25.7%, 18 responses), 30% or more but less than 50% (12.9%, 9 responses), 0% (no export plans) (11.4%, 8 responses), 0% (with export plans) (10.0%, 7 responses), and 50% or more but less than 70% (4.3%, 3 responses). The proportion of the responding entities reporting export plans of 50% or more was 4.3% (3 responses). Broken down by entity size, large companies (33.3%, 7 responses) and mid-sized companies (40.0%, 18 responses) showed the highest response rate for 10% or more but less than 30%, while small-sized companies (50.0%, 2 responses) showed the highest response rate for 0% or more but less than 10%.

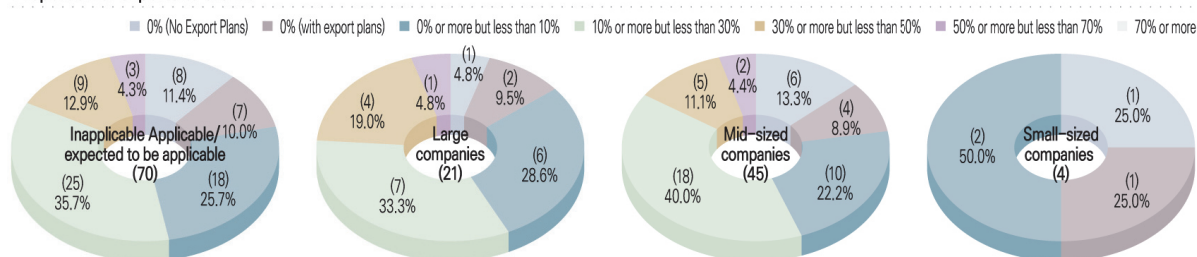
All respondents



By entity size



Proportion of exports to the EU

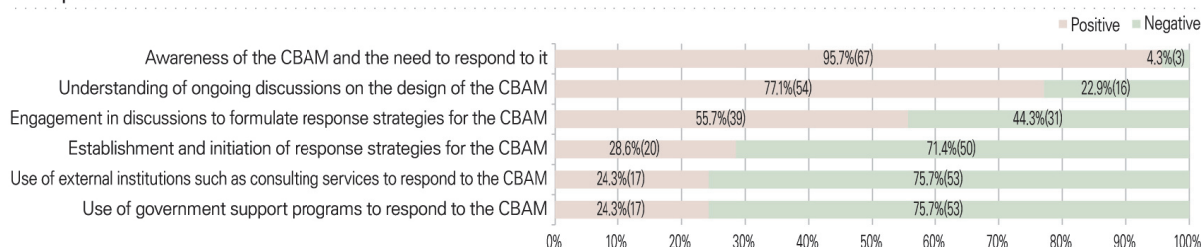


〈Figure IV-19〉 Applicability of the CBAM and Proportion of Exports to the EU

The views of entities that were identified as either subject to or expected to be subject to the CBAM towards the mechanism were analyzed. The survey results showed that most of the responding entities were aware of the CBAM and the need to respond to it (positive: 95.7%, 67 responses; negative: 4.3%, 3 responses). The respondents stated that they have monitored ongoing discussions on the design of the CBAM (positive: 77.1%, 54 responses; negative: 22.9%, 16 responses) and are currently engaged in discussions to formulate response strategies (positive: 55.7%, 39 responses; negative: 44.3%, 31 responses). Conversely, the proportion of negative responses was higher than that of positive responses regarding the following survey items: establishment and initiation of response strategies (positive: 28.6%, 20 responses; negative: 71.4%, 50 responses), the use of external institutions such as consulting services to respond to the CBAM (positive: 24.3%, 17 responses; negative: 75.7%, 53

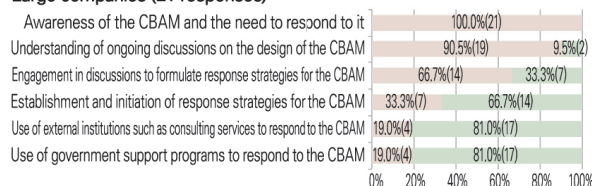
responses), and the use of government support programs to respond to the CBAM (positive: 24.3%, 17 responses; negative: 75.7%, 53 responses). Broken down by entity size, the response patterns for large and mid-sized companies were similar to the overall survey results, while for small-sized companies, the proportion of positive responses was higher than that of negative responses for all survey items.

All respondents

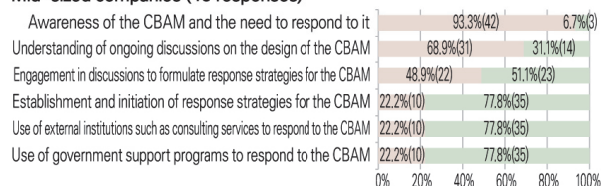


By entity size

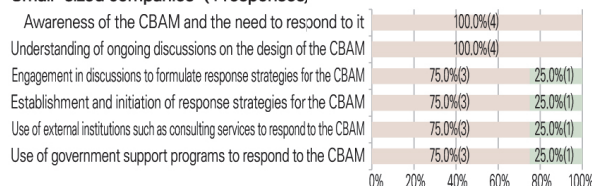
Large companies (21 responses)



Mid-sized companies (45 responses)



Small-sized companies (4 responses)

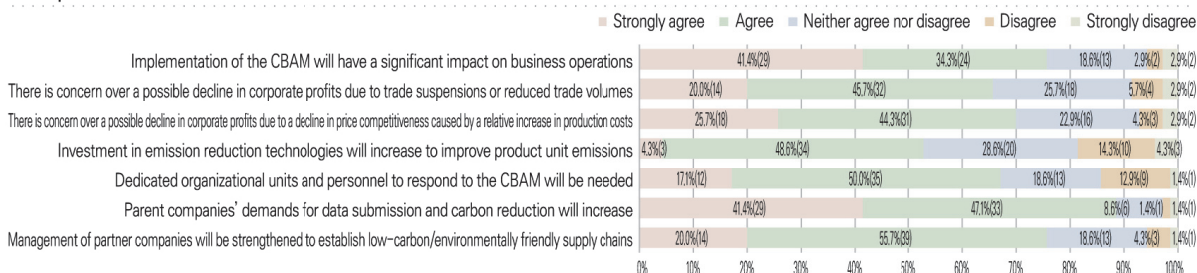


⟨Figure IV-20⟩ Current Status of the Response to the CBAM

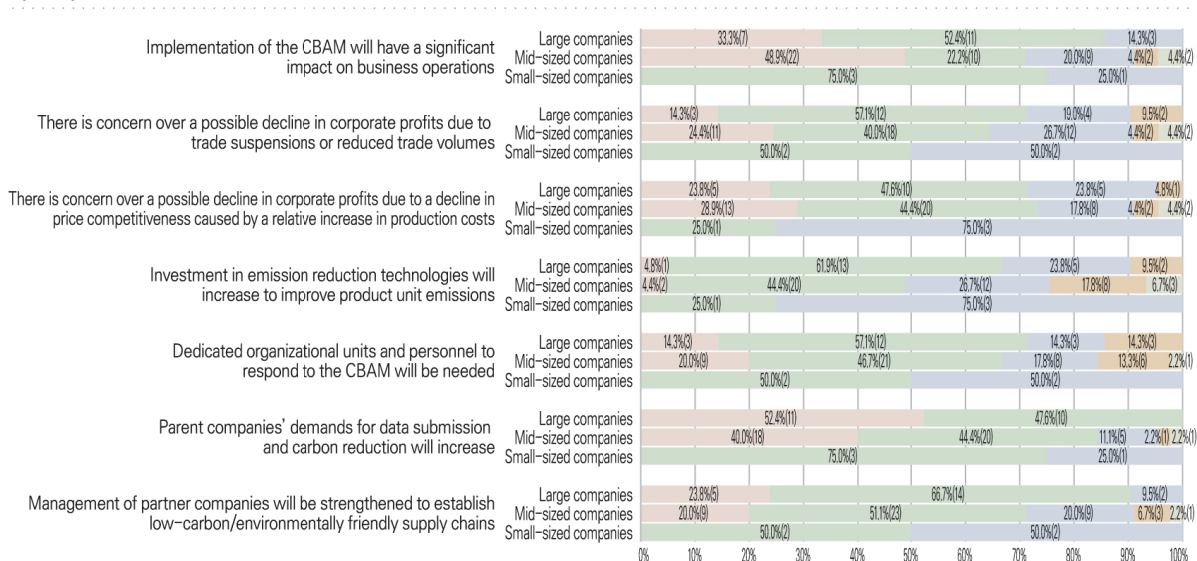
The anticipated impact of the CBAM on the business operations of the covered entities was assessed. The respondents reported that they believed the implementation of the CBAM will have a significant impact on business operations (positive: 75.7%, 53 responses; negative: 5.7%, 4 responses), were concerned about a possible decline in corporate profits due to trade suspensions or reduced trade volumes (positive: 65.7%, 46 responses; negative: 8.6%, 6 responses), and were concerned about a possible decline in corporate profits due to a decline in price competitiveness (positive: 70.0%, 49 responses; negative: 7.1%, 5 responses). In addition, they anticipated that investment in emission reduction technologies will increase (positive: 52.9%, 37 responses; negative: 18.6%, 13 responses),

dedicated organizational units and personnel to respond to the CBAM will be needed (positive: 67.1%, 47 responses; negative: 14.3%, 10 responses), parent companies' demands for data submission and carbon reduction will increase (positive: 88.6%, 62 responses; negative: 2.9%, 2 responses), and the management of partner companies will be strengthened (positive: 75.7%, 53 responses; negative: 5.7%, 4 responses). Broken down by entity size, the expectation of increased demands from parent companies regarding data submission and carbon reduction accounted for the highest proportion of responses for entities of all sizes (large companies: 100.0%, 21 responses; mid-sized companies: 84.4%, 38 responses; small-sized companies: 75.0%, 3 responses). Among large and medium-sized companies, the highest response rate was observed for the expectation of strengthened partner company management (large companies: 90.5%, 19 responses; mid-sized companies: 71.7%, 32 responses).

All respondents



By entity size

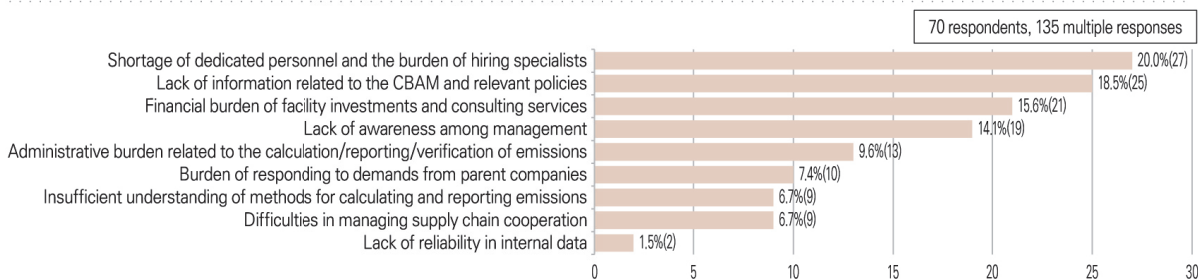


〈Figure IV-21〉 Anticipated Impact of the CBAM on Business Operations

The top three challenges in responding to the CBAM identified by covered entities were the shortage of dedicated personnel and the burden of hiring specialists (20.0%, 27 responses), the lack of information related to the CBAM and relevant policies (18.5%, 25 responses), and the financial burden of facility investments and consulting services (15.6%, 21 responses).

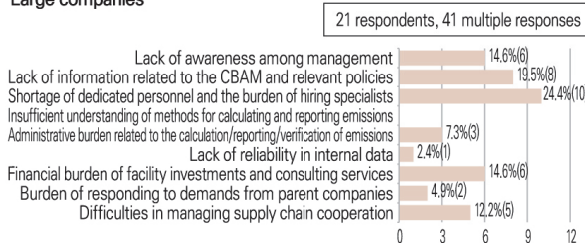
Broken down by entity size, the top two challenges in responding to the CBAM for large companies were the shortage of dedicated personnel and the burden of hiring specialists (24.4%, 10 responses) and the lack of information related to the CBAM and relevant policies (19.5%, 8 responses), while that for mid-sized companies were the shortage of dedicated personnel and the burden of hiring specialists (18.6%, 16 responses) and the financial burden of facility investments and consulting services (17.4%, 15 responses). For small-sized companies, the top two challenges were the lack of information related to the CBAM and relevant policies (37.5%, 3 responses) and difficulties in managing supply chain cooperation (25.0%, 2 responses).

All respondents

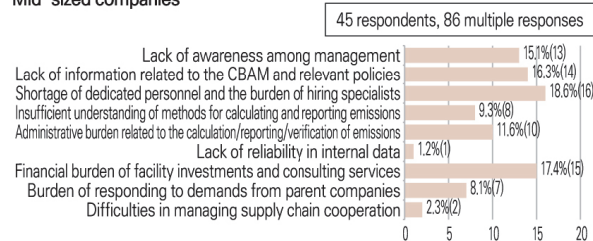


By entity size

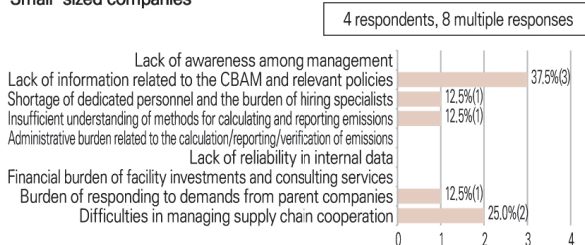
Large companies



Mid-sized companies



Small-sized companies



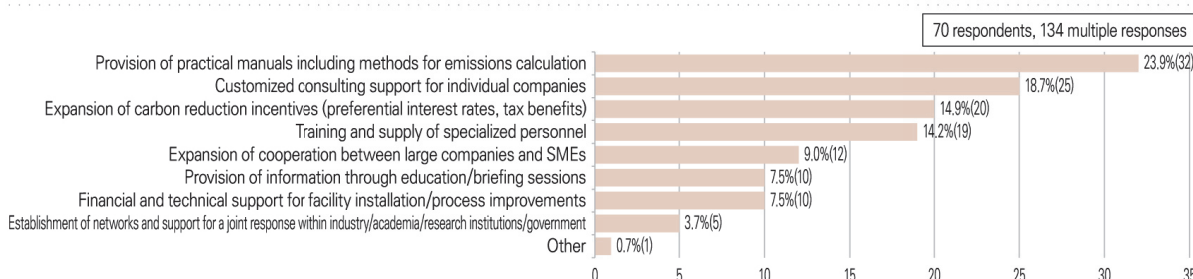
〈Figure IV-22〉 Challenges in Responding to the CBAM

The types of government support deemed necessary for responding to the CBAM were assessed. The top three types of government support identified by covered entities were the provision of practical manuals including methods for emissions calculation (23.9%, 32 responses), customized consulting support for individual companies (18.7%, 25 responses), and the expansion of carbon reduction incentives (14.9%, 20 responses).

Broken down by entity size, the top two types of government support deemed necessary for responding to the CBAM for large companies were the provision of practical manuals including methods for emissions calculation (28.2%, 11 responses) and the expansion of carbon reduction incentives (17.9%, 7 responses), while that for mid-sized companies were the provision of practical manuals

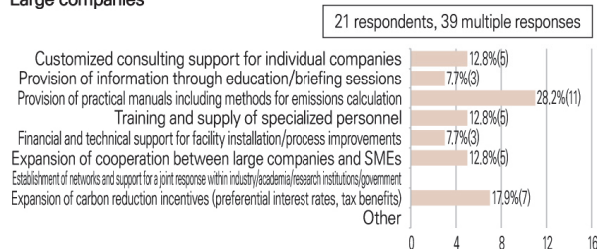
including methods for emissions calculation (23.0%, 20 responses) and customized consulting support for individual companies (21.8%, 19 responses). For small-sized companies, the most needed type of government support was the expansion of cooperation between large companies and SMEs (37.5%, 3 responses), followed by all other survey items (12.5%, 1 response, respectively) except for training and supply of specialized personnel and the expansion of carbon reduction incentives.

All respondents

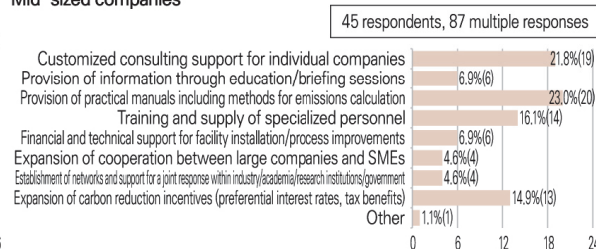


By entity size

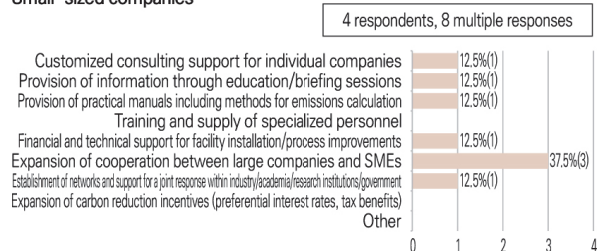
Large companies



Mid-sized companies



Small-sized companies



〈Figure IV-23〉 Government Support Needed for Responding to the CBAM

3

GHG Emission Reduction Efforts and Performance

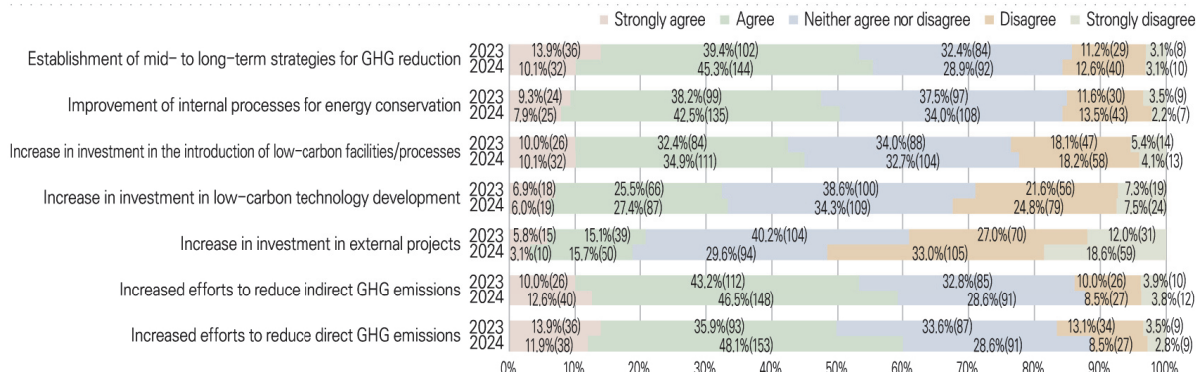
The impact of the covered entities' participation in the K-ETS on their GHG emission reduction activities was analyzed, with the survey results showing that the proportion of positive responses was higher than the proportion of negative responses for most survey items. The responding entities reported that their participation in the K-ETS has contributed to the establishment of mid- to long-term strategies for GHG reduction (positive: 55.3%, 176 responses; negative: 15.7%, 50 responses) and the improvement of internal processes for energy conservation (positive: 50.3%, 160 responses; negative: 15.7%, 50 responses) and has led to an increase in investment for introducing low-carbon facilities or processes (positive: 45.0%, 143 responses; negative: 22.3%, 71 responses) and in investment for low-carbon technology development (positive: 33.3%, 106 responses; negative: 32.4%, 103 responses). The responding entities also stated that their participation has led to an increase in efforts to reduce indirect (Scope 2) GHG emissions (positive: 59.1%, 188 responses; negative: 12.3%, 39 responses) and direct GHG emissions (positive: 60.1%, 191 responses; negative: 11.3%, 36 responses). Conversely, the proportion of negative responses was higher than that of positive responses for an increase in investment for implementing external projects (positive: 18.9%, 60 responses; negative: 51.6%, 164 responses). In terms of the impact of the K-ETS on GHG emission reduction activities, an increase in efforts to reduce direct GHG emissions (60.1%, 191 responses) accounted for the highest proportion of responses.

Broken down by entity size, regarding most survey items, the proportion of positive responses was higher than that of negative responses for entities of all sizes, and, in general, the proportion of positive responses was higher in the order of large companies, other entities (public institutions), mid-sized companies, and small-sized companies. The proportion of positive responses regarding the K-ETS's contribution to the establishment of mid- to long-term strategies for GHG reduction was 65.2% (60 responses) for large companies, 57.1% (16 responses) for other entities (public institutions), 50.9% (85 responses) for mid-sized companies, and 48.4% (15 responses) for small-sized companies, and the proportion of positive responses regarding the K-ETS's contribution to the improvement of internal processes for energy conservation was 60.9% (56 responses) for large companies, 42.9% (12

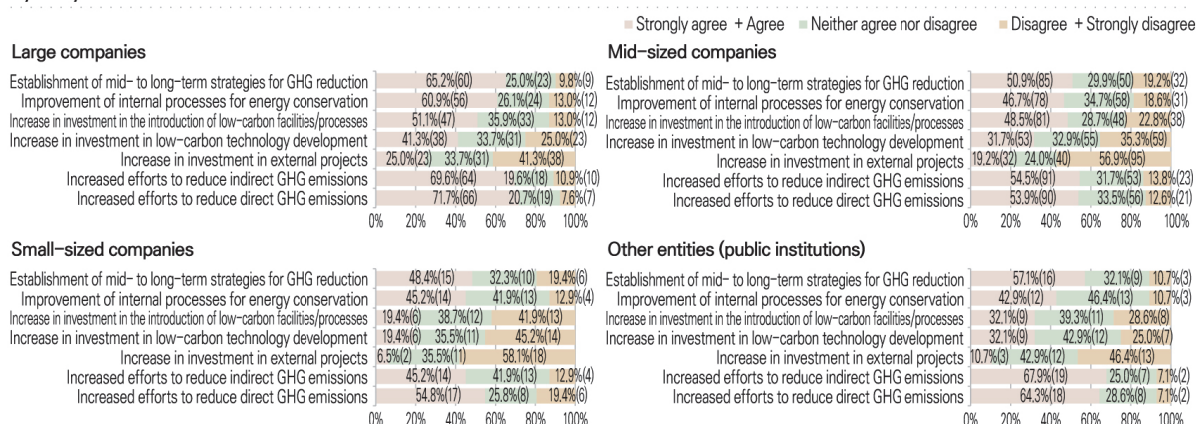
responses) for other entities (public institutions), 46.7% (78 responses) for mid-sized companies, and 45.2% (14 responses) for small-sized companies. The proportion of positive responses for an increase in investment for introducing low-carbon facilities or processes was 51.1% (47 responses) for large companies, 48.5% (81 responses) for mid-sized companies, 32.1% (9 responses) for other entities (public institutions), and 19.4% (6 responses) for small-sized companies. The proportion of positive responses for an increase in investment for low-carbon technology development was 41.3% (38 responses) for large companies, 32.1% (9 responses) for other entities (public institutions), 31.7% (53 responses) for mid-sized companies, and 19.4% (6 responses) for small-sized companies. The proportion of positive responses for an increase in efforts to reduce indirect (Scope 2) GHG emissions was 69.6% (64 response) for large companies, 67.9% (19 responses) for other entities (public institutions), 54.5% (91 responses) for mid-sized companies, and 45.2% (14 responses) for small-sized companies. The proportion of positive responses for an increase in efforts to reduce direct GHG emissions was 71.7% (66 responses) for large companies, 64.3% (18 responses) for other entities (public institutions), 54.8% (17 responses) for small-sized companies, and 53.9% (90 responses) for mid-sized companies. Consistent with the overall response distribution, the proportion of positive responses for an increase in investment for implementing external projects remained low for entities of all sizes. Specifically, the positive response rate was 25.0% (23 responses) for large companies, 19.2% (32 responses) for mid-sized companies, 10.7% (3 responses) for other entities (public institutions), and 6.5% (2 responses) for small-sized companies. Of note is that, for small-sized companies, the proportion of positive responses did not exceed 50% for any of the survey items except for an increase in efforts to reduce direct GHG emissions.

Broken down by sector, the proportion of positive responses for an increase in efforts to reduce indirect (Scope 2) GHG emissions was the highest for the public services/other and industry sectors, and that for an increase in efforts to reduce direct GHG emissions was the highest for the industry and waste sectors. In the waste sector, the response rates for an increase in efforts to reduce direct and indirect (Scope 2) GHG emissions were found to be identical.

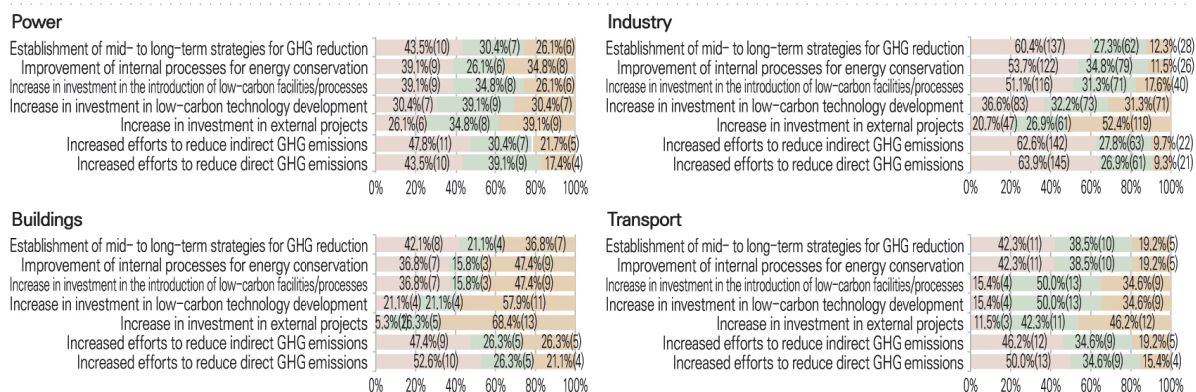
All respondents



By entity size



By sector



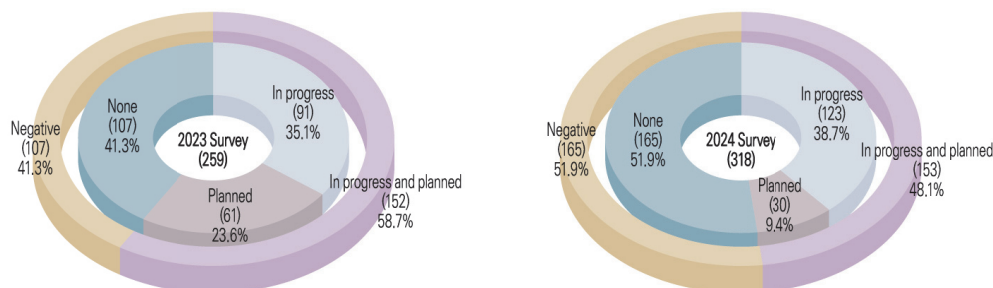
〈Figure IV-24〉 Impact of Participation in the K-ETS on GHG Emission Reduction Activities

In terms of internal emission reduction activities in Phase III, 123 entities (38.7%) reported that they were currently implementing these activities, while 30 entities (9.4%) reported having plans to implement these activities, and 165 entities (51.9%) reported that they have not implemented these activities. The proportion of entities reporting to have implemented internal reduction activities in the 2023 compliance year (38.7%, 123 responses) was slightly higher compared to that in the 2022 compliance year (35.1%, 91 responses). However, the proportion of entities reporting to have plans to implement these activities during Phase III has decreased from 23.6% (61 responses) in the previous year's survey to 9.4% (30 responses) in the present survey.

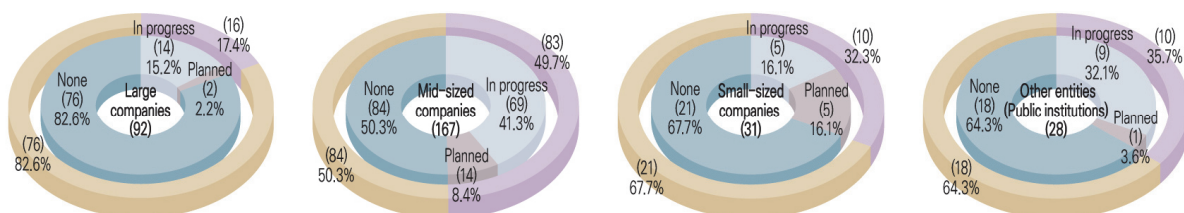
Broken down by entity size, the proportion of entities currently implementing or having plans to implement internal reduction activities during Phase III was the highest for large companies (54.3%, 50 responses), followed by mid-sized companies (49.7%, 83 responses), other entities (public institutions) (35.7%, 10 responses), and small-sized companies (32.3%, 10 responses).

Broken down by sector, the proportion was highest for the industry sector (55.5%, 126 responses), followed by public services/other (50.0%, 1 response) and waste (33.3%, 7 responses), and lowest for the transport sector (23.1%, 6 responses).

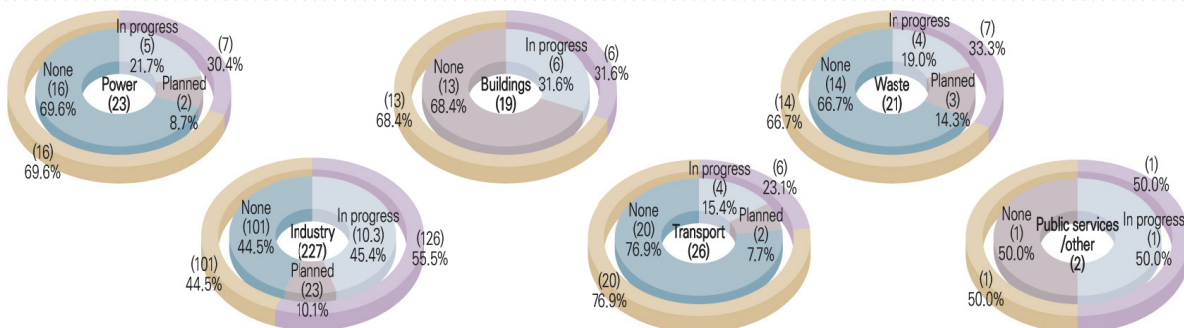
All respondents



By entity size



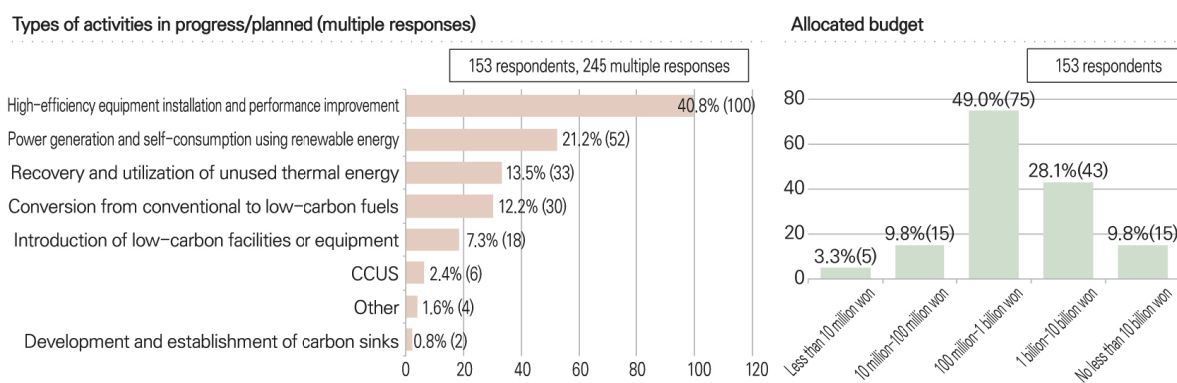
By sector



〈Figure IV-25〉 Implementation of Internal Reduction Activities during Phase III

According to the 153 responding entities that reported they are currently implementing or have plans to implement internal reduction activities, the most common type of activity in progress or planned was the installation of high-efficiency equipment and the improvement of equipment performance (40.8%, 100 responses), followed by power generation and self-consumption using renewable energy (21.2%, 52 responses), the recovery and utilization of unused thermal energy (13.5%, 33 responses), and conversion to low-carbon fuels (12.2%, 30 responses). These activities are the same as the four main actions selected by the responding entities in the previous year's survey regarding the internal reduction activities that they implemented in the 2022 compliance year and planned for Phase III.

Regarding the budget allocated for internal reduction activities, the response rate was the highest for 100 million to 1 billion won (49.0%, 75 responses), followed by 1 billion to 10 billion won (28.1%, 43 responses), 10 million to 100 million (9.8%, 15 responses), no less than 10 billion won (9.8%, 15 responses), and less than 10 million won (3.3%, 5 responses).



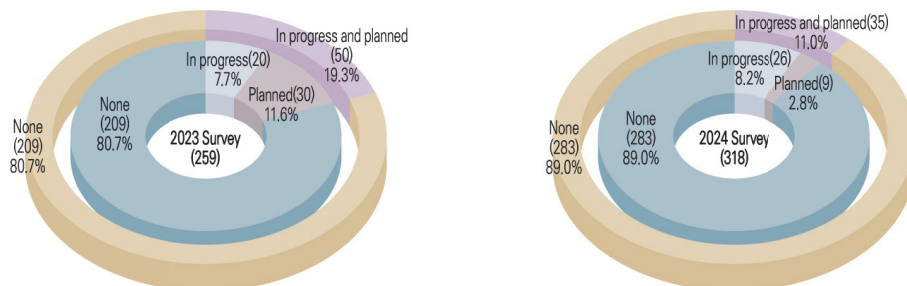
〈Figure IV-26〉 Types of Internal Emission Reduction Activities in Progress/Planned for Phase III and Allocated Budget

In terms of external emission reduction activities for Phase III, 26 entities (8.2%) claimed that they are currently implementing these activities and 9 entities (2.8%) claimed that they have plans to implement these activities, while 283 entities (89.0%), representing an overwhelming majority of the responding entities, reported that they do not have a plan to implement these activities. In addition, the proportion of entities with plans to implement external reduction projects during Phase III (2.8%, 9 response) is lower compared to the previous year's survey, where the proportion of entities with external emission reduction activities in progress in the 2022 compliance year was 7.7% (20 responses), and those with plans to implement these activities in the future was 11.6% (30 responses).

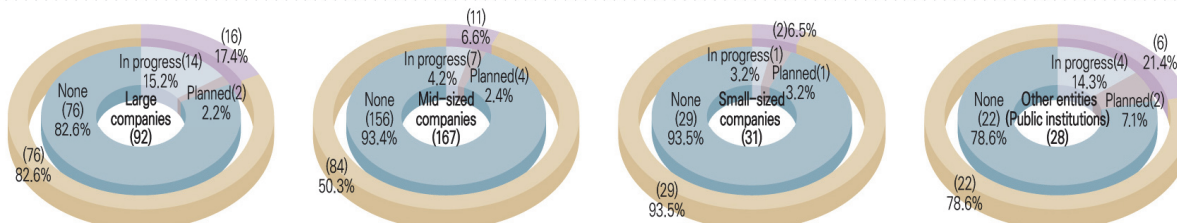
Broken down by entity size, the proportion of entities currently implementing or with plans to implement external reduction activities during Phase III was the highest for other entities (public institutions) (21.4%, 6 responses), followed by large companies (17.4%, 16 responses), mid-sized companies (6.6%, 11 responses), and small-sized companies (6.5%, 2 responses).

Broken down by sector, the proportion of entities with plans to implement external reduction activities during Phase III was highest in the public services/other sector (50.0%, 1 response), followed by power (26.1%, 6 responses) and waste (23.8%, 5 responses), and the proportion of entities currently implementing these activities was highest in the public services/other sector (50.0%, 1 response), followed by power (26.1%, 6 responses), waste (14.3%, 3 responses), and industry (7.0%, 16 responses).

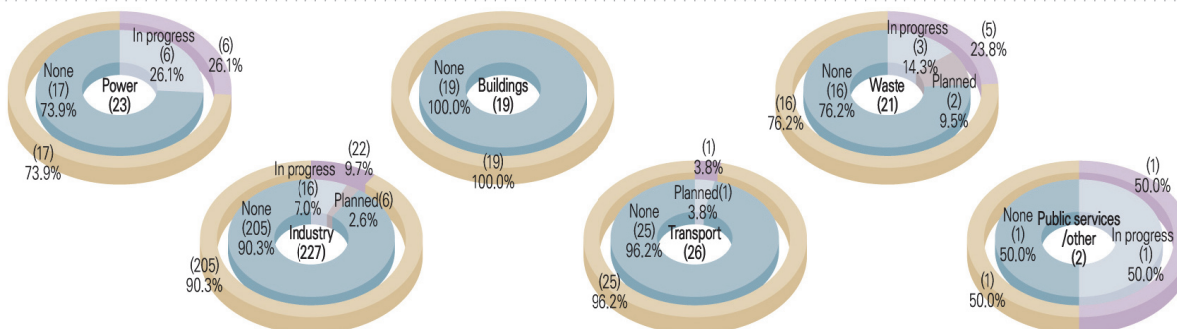
All respondents



By entity size



By sector

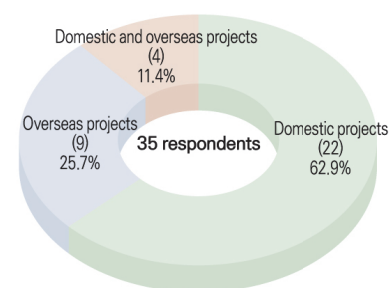


〈Figure IV-27〉 Implementation of External Reduction Activities during Phase III

Of the 35 responding entities reporting that they are currently implementing or have plans to implement external reduction activities, the majority selected domestic projects (62.9%, 22 responses) as the category of activities primarily implemented or planned to be implemented, followed by those who selected overseas projects (25.7%, 9 responses) and domestic and overseas projects (11.4%, 4 responses). For domestic projects, projects promoted by medium-sized companies accounted for the highest proportion of responses (40.9%, 9 responses), while projects promoted by large companies accounted for the highest proportion for overseas projects (88.9%, 8 responses) and domestic and overseas projects (50.0%, 2 responses). The reasons for implementing external reduction activities

included the use of KOCs for the K-ETS by converting them into KCUs (52.3%, 23 responses), the implementation of a project as part of ESG management (29.5%, 13 responses), and the trading of KOCs in the emissions trading market or the voluntary carbon market (VCM) (15.9%, 7 responses).

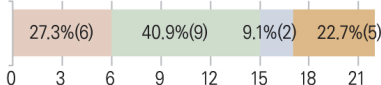
Categories of activities in progress/planned



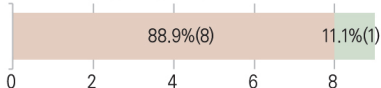
By activity category

Large companies (brown), Mid-sized companies (green), Small-sized companies (blue), Other entities (Public institutions) (orange)

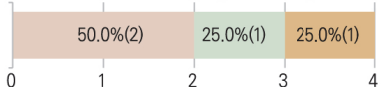
Domestic projects (22 responses)



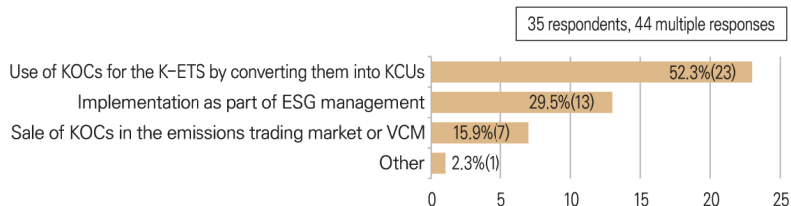
Overseas projects (9 responses)



Domestic and overseas projects (4 projects)

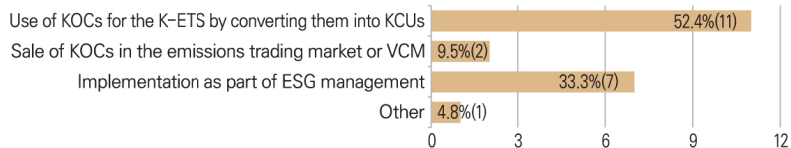


Reasons for implementing external activities (up to two responses)

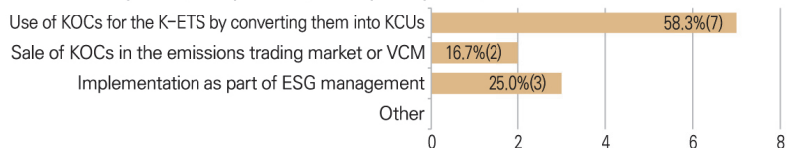


Reasons for implementing external activities (up to two responses)

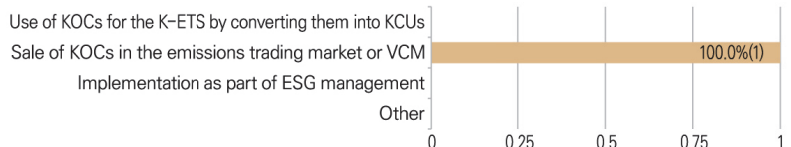
Large companies (16 respondents, 21 multiple responses)



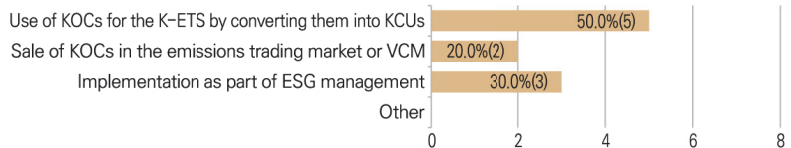
Mid-sized companies (11 respondents, 1 multiple responses)



Small-sized companies (1 respondents, 1 multiple responses)



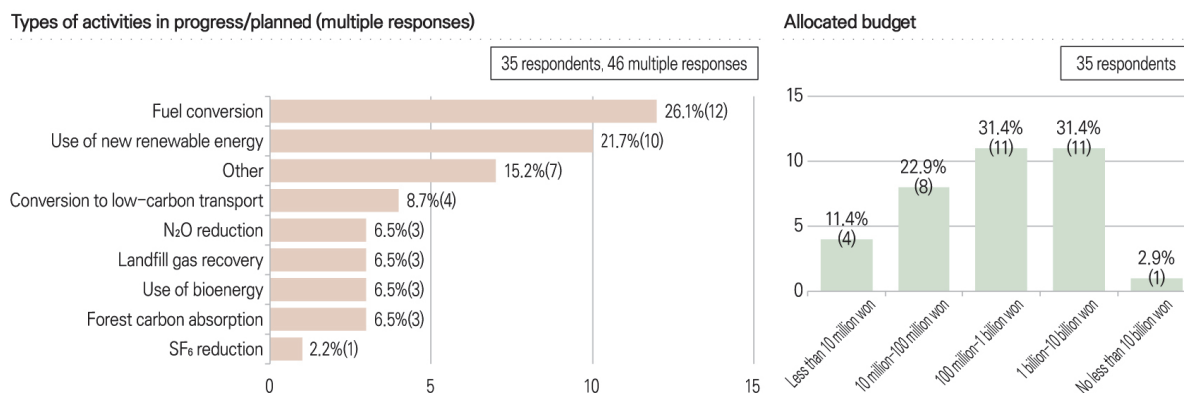
Other entities (public institutions) (6 respondents, 10 multiple responses)



〈Figure IV-28〉 Categories of External Reduction Activities in Progress/
Planned for Phase III and Reasons for Implementing them

In terms of specific types of external reduction activities, the most common activity in progress or planned was fuel conversion projects (26.1%, 12 responses), followed by the use of new renewable energy (21.7%, 10 responses). This is consistent with the results of the previous year's survey, where 40.3% of the responding entities (25 responses) selected the use of new renewable energy and 16.1% (10 responses) selected fuel conversion projects as the key external projects pursued in the 2022 compliance year, indicating that covered entities have primarily been interested in projects that involve fuel conversion or the utilization of new renewable energy.

Regarding the budget allocated for external reduction activities, the response rate was the highest for 100 million to 1 billion won and 1 billion to 10 billion won (31.4%, 11 responses, respectively), followed by 10 million to 100 million won (22.9%, 8 responses), less than 10 million won (11.4%, 4 responses), and no less than 10 billion won (2.9%, 1 response).

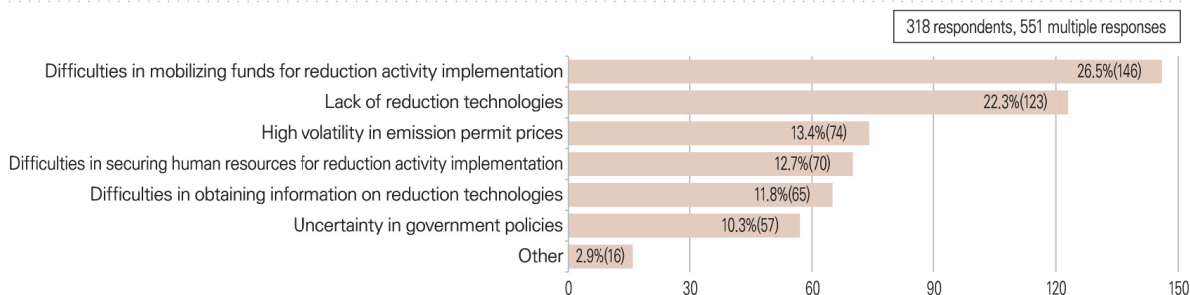


〈Figure IV-29〉 Types of External Reduction Activities in Progress/Planned for Phase III and Allocated Budget

In addition, the top three factors hindering the implementation of internal and external GHG emission reduction activities identified by covered entities were difficulties in mobilizing funds for the implementation of reduction activities (26.5%, 146 responses), the lack of reduction technologies (22.3%, 123 responses), and high volatility in emission permit prices (13.4%, 74 responses). Other factors included the lack of managerial interest in reduction activities, the need to ease certification procedures and standards for micro-scale external projects, and difficulties in implementing reduction activities due to the diversification of related organizations.

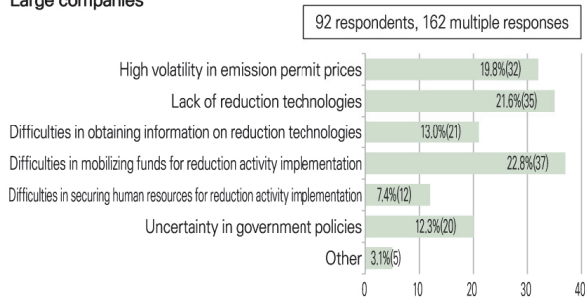
Broken down by entity size, the top two factors hindering the implementation of reduction activities for large companies were difficulties in mobilizing funds for the implementation of reduction activities (22.8%, 37 responses) and the lack of reduction technologies (21.6%, 35 responses), while that for mid-sized and small-sized companies and other entities (public institutions) were (although in a different order) difficulties in mobilizing funds for the implementation of reduction activities (mid-sized companies: 28.4%, 83 responses; small-sized companies: 28.6%, 14 responses; other entities (public institutions): 25.0%, 12 responses) and the lack of reduction technologies (mid-sized companies: 22.9%, 67 responses; small-sized companies: 26.5%, 13 responses; other entities (public institutions): 16.7%, 8 responses).

All respondents

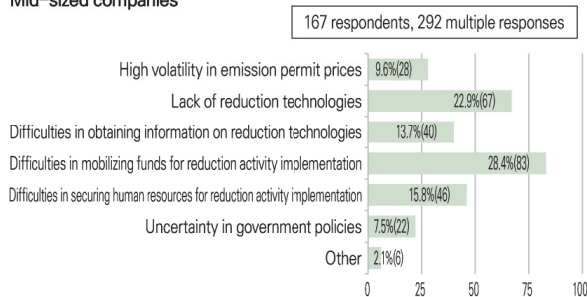


By entity size

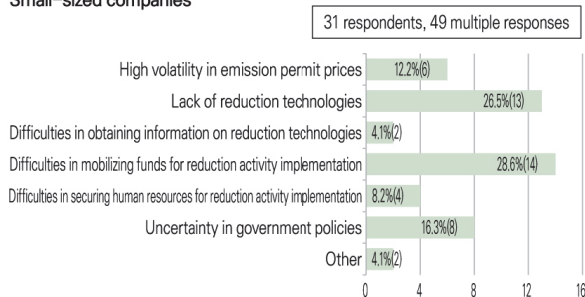
Large companies



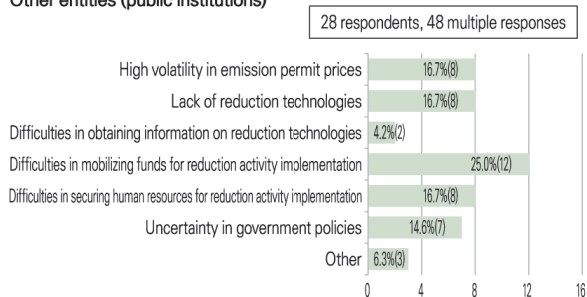
Mid-sized companies



Small-sized companies



Other entities (public institutions)



〈Figure IV-30〉 Factors Hindering GHG Emission Reduction Activities

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