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Phase Ⅱ | 2018-2020

2020 Korean Emissions Trading System Report

Ministry of Environment
Greenhouse Gas Inventory and Research Center

01 Notes for the Reader

❶ This report analyzes the implementation results (November 7, 2018 to August 9 , 2021) for the Korean Emissions Trading System (K-ETS) including 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 (hereafter "the Act").

❷ This report is based on entity-level data for emission permits provided by the National GHG Management System (NGMS), Emissions Trading Registry System (ETRS), Offset Registry System (ORS), and Korea Exchange (KRX):

- **National GHG Management System (NGMS)**: a database for the Greenhouse Gases (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 monitoring plans (http://ngms.gir.go.kr).
- **Emissions Trading Registry System (ETRS):** a computerized system for the registration and management of all data related to the allocation, trading, banking, borrowing of emission permits, certified GHG emissions and etc. (http://etrs.gir.go.kr).
- **Offset Registry System (ORS):** a computerized system for the registration and management of data related to external offset projects such as methodologies for the reduction, absorption, or removal of GHGs and certified reductions (http://ors.gir.go.kr).
- **Korea Exchange (KRX):** an emission permit Exchange designated in accordance with Article 22 of the Act.

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

❹ This report uses CO_2 equivalent ton ($tCO_2eq.$) based on the global warming potential (GWP) by 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 transactions for emission permits.

- **1 KAU, 1 KCU, 1 KOC : 1$tCO_2eq.$**
- **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 by 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 will also be referred to as one of the emission permits in the text).

❺ This report summarizes the operational results for 2020, which is the final compliance year for Phase Ⅱ of the K-ETS. For the implementation of Phase Ⅲ, the Act (which came into effect on June 1, 2020) and the Enforcement Decree of the Act (which came into effect on March 23, 2021) (hereinafter "the Enforcement Decree") were amended.

Type		Phase Ⅱ (2018-2020)	Phase Ⅲ (2021-2025)
Act		Act on the Allocation and Trading of Greenhouse gas Emission Permits (came into force on January 17, 2019) (Act No.15836, partially amended on October 16, 2018)	Act on the Allocation and Trading of Greenhouse gas Emission Permits (came into force on June 1, 2020) (Act No. 17104, partially amended on March 24, 2020)
Enforcement Decree		Enforcement Decree of the Act on the Allocation and Trading of Greenhouse gas Emission Permits (came into force on February 8, 2019) (Presidential Decree No. 29518, amended on February 8, 2019 upon the amendment of another Act)	Enforcement Decree of the Act on the Allocation and Trading of Greenhouse gas Emission Permits (came into force on March 23, 2021) (Presidential Decree No. 31548, partially amended on March 23, 2021)
Guidelines	Allocation of Emission Permits	Guidelines for the Allocation, Allocation Adjustment, and Allocation Revocation of GHG Emission Permits (came into force on July 31, 2018) (Ministry of Environment Notification No. 2018-126, partially amended on July 31, 2018)	Guidelines for the Allocation, Allocation Adjustment, and Allocation Revocation of GHG Emission Permits (came into force on December 24, 2020) (Ministry of Environment Notification No. 2020-270, wholly amended on December 24, 2020)
	Emissions Reporting and Certification	Guidelines for the Reporting and Certification of Emissions under the GHG Emissions Trading System (came into force on January 1, 2022) (Ministry of Environment Notification No. 2021-278, partially amended on December 21, 2021)	
	Verification	Guidelines for the Verification of the Operations of the GHG Emissions Trading System (came into force on June 8, 2021) (Ministry of Environment Notification No. 2021-112, partially amended on June 8, 2021)	
	Emissions Trading	Notification on GHG Emissions Trading (came into force on May 1, 2018) (Ministry of Environment Notification No. 2018-67, partially amended on May 1, 2018)	
		Regulations for the Additional Allocation of Emission Permits for Auctions and Market Stabilization Measures (came into force on May 8, 2020) (Ministry of Environment Notification No. 2020-108, partially amended on May 8, 2020)	
		Notification on the Supervision of the Emissions Exchange (came into force on May 1, 2018) (Ministry of Environment Notification No. 2018-68, partially amended on May 1, 2018)	
		Notification on Application Qualifications and Evaluation Standards for the Emissions Exchange (came into force on May 1, 2018) (Ministry of Environment Notification No. 2018-69, partially amended on May 1, 2018)	
		Notification on the Designation and Operations of Market Makers within the Emissions Trading Market (came into force on January 15, 2021) (Ministry of Environment Notification No. 2021-15, partially amended on January 15, 2021)	
		Notification on Emission trade brokerage companies (came into force on October 19, 2021) (Ministry of Environment Notification No. 2021-203, partially amended on October 19, 2021)	
	Offset Mechanism	Guidelines for the Feasibility Assessment of External Offset Projects and the Certification of Reductions (came into force on May 21, 2021) (Ministry of Environment Notification No. 2021-105, partially amended on May 21, 2021)	

❻ Following the amendment of the Enforcement Decree, changes were made to Phase Ⅱ and Phase Ⅲ, the main points of which are summarized in the table below. For Phase Ⅲ, provisions for the cancellation of the designation of covered entities and the succession of rights and obligations were newly enacted, while the business entity level subject to the allocation of emission permits was changed from facilities to business establishments and the percentage of auctioned emission permits was increased from 3% to 10%.

Type	Phase Ⅱ (2018-2020)	Phase Ⅲ (2021-2025)	Act	Enforce-ment Decree
Designation of Entities	-	Provision for the cancellation of the designation of entities is newly enacted	Art. 8	Art. 10
Succession of Rights and Obligations	-	Provision on the succession of rights and obligations is newly enacted	Art. 8-2	Art. 11
Sub-sectors Eligible for Free Allocation	Sub-sectors ①with a trade intensity[1] of no less than 30%, ②with production costs[2] of no less than 30%, ③with a trade intensity of no less than 10% and production costs of no less than 5% are eligible for free allocation	Sub-sectors are eligible for free allocation if their trade intensity multiplied by production costs is no less than 0.002 (0.2%)	Art. 12	Art. 19
Expansion of Auction	At least 3% of emission permits allocated to a covered entity subject to auction	At least 10% of emission permits allocated to a covered entity subject to auction	-	Art. 18
Allocation Application	Facility-level	Business establishment-level (allocation applications are prepared for all business establishments of an entity)	Art. 13	Art. 20
Reserves	Reserves are used to allocate additional emission permits for market stabilization measures	The use and purpose[3] of reserves are amended	Art. 18	Art. 30
Market Makers	-	Provisions for the roles, duties, and standards for the designation of market makers in the emissions trading market[4] are introduced	Art. 22-2	Art. 37

Type	Phase Ⅱ (2018-2020)	Phase Ⅲ (2021-2025)	Act	Enforce-ment Decree
Verification Bodies and Verifiers	-	Provisions for the duties of verification bodies and verifiers, standards for designation of verification bodies, and qualifications of verifiers are introduced	Arts. 24-2 and 24-3	Arts. 40 and 41
Penalties	-	Standards subject to penalties are amended	Art. 33	Art. 51
Condition Surveys	Status of allocation applications, early reduction results, additional allocation, and allocation revocation are surveyed	On-the-spot inspections of market makers and verification bodies are added	Art. 37	-

1) Trade Intensity: (annual average exports for the relevant sub-sector for the base period + annual average imports for the relevant sub-sector for the base period) ÷ (annual average sales for the relevant sub-sector for the base period + annual average imports for the relevant sub-sector for the base period)
2) Production Costs: (annual average GHG emissions for the relevant sub-sector for the base period × average market price of the emission permits for the base period) ÷ annual average value-added production volume for the relevant sub-sector for the base period
3) Reserves: The competent authority may possess allowance reserves after dividing them based on their use or purpose, and use them for the additional allocation of emission permits, market-making activities of market makers, the additional allocation of emission permits for market-stabilization measures, objection processing, and the allocation of emission permits to new entrants.
4) Market Makers in the Emissions Trading Market: Market makers are designated for the stable operation of the emissions trading market such as revitalizing emission permit transactions in the market established by an emissions exchange. (Details will be explained in 1.2 of Chapter I)

02 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 emissions allowances to business establishments that emit more than a certain amount of GHGs, meaning that they can emit GHGs up to the limit set by the emissions 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)[1] as an allocation method 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 level of reduction of GHG emissions by covered entities, the government raised emissions reduction targets so that they were higher than the level achieved in Phase Ⅰ. Auctions were introduced, with 3% of the emissions allowances designated for sub-sectors subject to auction permitted to use auctions, and market makers also began to participate in market transactions. In addition, in order to solve problems such as an imbalance in supply and demand for emission permits, standards restricting the banking of surplus emission permits within a phase were introduced[2].

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 the national GHG reduction targets. The Master Plan focuses on promoting strategies such as further developing allocation methods, encouraging a substantial reduction in GHG emissions, and expanding market functions.

1) Of the 26 sub-sectors, benchmarking was applied to three (cement, oil refining, and aviation), and grandfathering, a method of allocation based on past emissions, was applied to the others.

2) See "〈Table Ⅱ-5〉 Legal Grounds and Standards for the Flexibility Mechanisms in Phase Ⅱ" in Section 2.4 Flexibility Mechanisms in Part 2.

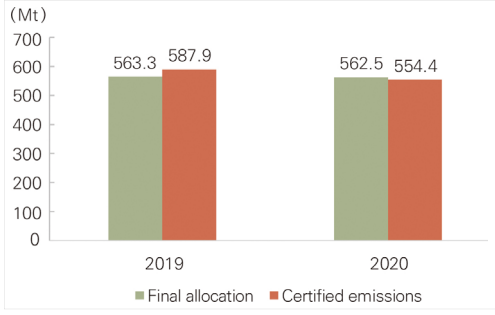
For the implementation of these strategies, the Allocation Plan for Phase Ⅲ (2021-2025), which contains detailed standards regarding total emissions allowances, standards for free allocations and auctions, and benchmark-based allocations, was established.

2) K-ETS Operational Results

For the 2020 compliance year, the pre-allocation amount was 530.7 Mt (604 entities), while the final allocation amount reflecting the changes (e.g., additional allocations, allocation revocations and the succession of rights and obligations) was 562.5 Mt (637 entities).[3] The final allocation in 2020 was 0.2% lower than the previous year (563.3 Mt), and consisted of 559.3 Mt from free allocations (99.4%) and 3.2 Mt from auctioned allowances (0.6%).

The certified emissions for 2020 amounted to 554.4 Mt (636 entities), which was 5.7% lower than the previous year (587.9 Mt, 610 entities). The amount of emission permits surrendered by covered entities in the 2020 compliance year was 554.4 Mt (635 entities), made up of 553.7 Mt from Korean Allowance Units (KAUs) (99.9%) and 0.7 Mt from Korean Credit Units (KCUs) (0.1%). Penalties will be imposed on one covered entity that failed to meet its obligation to surrender emission permits for 2020 (5.4 kt).

〈Free allocation and Certified emissions in 2019-2020〉



Covered entities surrendered or traded emission permits by utilizing emission permits carried over from the previous compliance year (2019), which amounted to 17.2 Mt. The amount of emission permits carried over to the next compliance year (2021) was 17.9 Mt. No emission permits were borrowed from the 2021 compliance year because, for the final compliance year within a phase, borrowing from the first compliance year in the subsequent phase is not permissible.

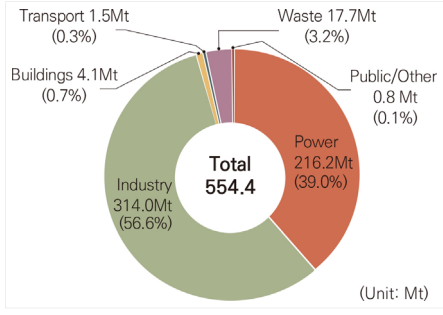
Broken down by sector, though the amount of certified emissions exceeded the final allocation amount for the power, buildings, and public services/other sectors, emissions targets (i.e., final allocations) were met in all sectors by trading and banking emission permits and utilizing offset mechanisms.

3) Thirty-three entities have been added due to the succession of rights and obligations and the designation of new covered entities.

The amount of certified emissions was lower compared to the previous year in the power, industry, transport and buildings sectors. The certified emissions from the power sector were 216.2 Mt from 36 entities; though the number of entities increased by three compared to the previous year, the amount of emissions decreased by 29.3 Mt (11.9%) due to a decrease in electricity production. Due to a decrease in production caused by reasons such as the coronavirus disease pandemic (COVID-19), the amount of certified emissions from the industry sector decreased to 314.0 Mt (479 entities), which was lower than the previous year by 4.0 Mt (1.2%). The amount of emissions from the transport sector was 1.5 Mt (6 entities), which was lower than the previous year by 0.4 Mt (21.7%) due to the reduction in new airline services and the number of flights. The amount of emissions from the buildings sector was 4.1 Mt (39 entities), which was lower than the previous year by 4.4% due to reasons such as the decrease in the number of shopping mall customers and business hours, and the switch to online lectures at universities.

The amount of certified emissions from the waste sector and public services/other sectors increased slightly compared to the previous year. The amount of emissions from the waste sector was 17.7 Mt (74 entities), which was higher than the previous year by 1.7% due to reasons such as the increase in domestic waste caused by the effects of COVID-19. The amount of emissions from the public services/other sectors was 0.8 Mt (2 entities), which was 0.8% higher than the previous year.

〈Certified emissions by sector in 2020〉



3) Analysis of Emissions Trading Market Performance

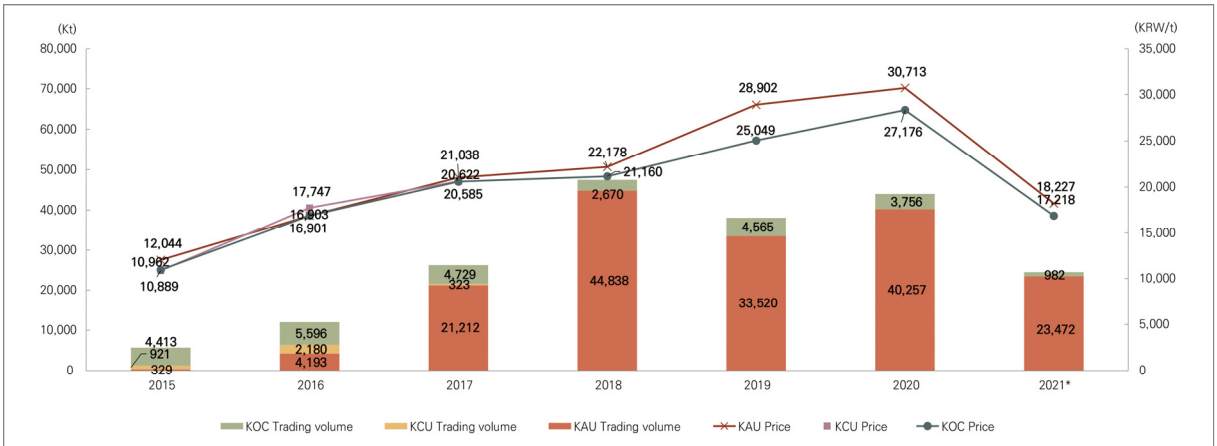
A total of 198.0 Mt of emission permits were traded through the exchange and over-the-counter during the trading period in Phases I and II (January 1, 2015-August 9, 2021). Of this, 167.8 Mt of KAUs (84.8%), 26.7 Mt of KOCs (13.5%), and 3.4 Mt of KCUs (1.7%) were traded. Broken down by type of market, the trading volume was 87.0 Mt (43.9%) in the exchange market and 111.0 Mt (56.1%) in the over-the-counter market; the trading volume in the over-the-counter market was higher by 27.5%.

The average trading price of the emission permits per ton during this period (January 1, 2015-August 9, 2021) was 23,914 won. The average trading price per ton rose continuously between 2015

and 2020, from 11,013 won to 17,056 won, 20,951 won, 22,120 won, 28,440 won, and 30,411 won.

The continuous increase in the trading price and trading volume from 2015 led to an increase in the total payments, from 62.4 billion won in 2015 to 204.1 billion won in 2016, 550.3 billion won in 2017, 1,050.9 billion won in 2018, 1,083.1 billion won in 2019, and 1,338.5 billion won in 2020. The total payments for emission permits as of the last trading day for KAU20 in 2021 were 444.8 billion won.

〈Trends in the Total trading volume and Price by Emission permit〉



* Trading records are until the last trading day for KAU20 in 2021 (August 9, 2021).

The total trading volume during the trading period (November 15, 2018–August 9, 2021) for emission permits in the 2020 compliance year was 41.3 Mt for KAU20 and 10.4 Mt for KOCs, accounting for 79.9% and 20.1% of the total, respectively.

With respect to KAU20, 17.2 Mt (41.7%) were traded through exchange trading and 24.1 Mt (58.3%) through over-the-counter trading. According to the analysis of the trading volume of the 10 sub-sectors with the highest certified emissions, the power generation and steel had the highest net purchase of 7.0 Mt and 4.1 Mt, respectively, and the cement and petrochemicals had the highest net sales of 2.1 Mt and 1.8 Mt, respectively.

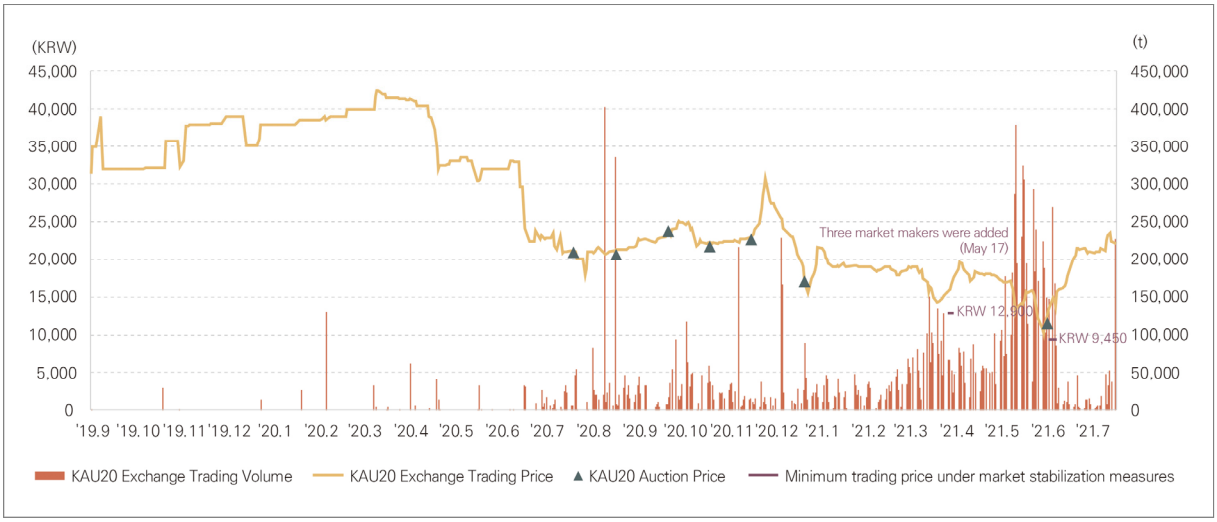
Between August 2020 and June 2021, a total of seven auctions were held for the allocation of KAU20. The planned volume for KAU20 auctions was 8.1 Mt. However, the total volume of bids made at the seven auctions was 7.1 Mt, and the total volume of valid bids was 3.2 Mt, representing 45.6% of the total volume of bids made. The total volume of valid bids was lower than the total volume of bids made at auctions because the government temporarily suspended the auctions for emission permits from February to May in 2021 in consideration of the price of emission permits and the

amount of emission permits available on the market.

The exchange trading price of a KAU20 during the trading period (September 24, 2019–August 9, 2021) rose from 31,000 won to 42,500 won (closing price) in early April 2020 but fell to 20,995 won in August 2020 due to the effects of COVID-19. The average exchange trading price of a KAU20 ultimately reached 18,510 won. The auction prices for KAU20 were 11,450–23,700 won, which were similar to its exchange trading price.

The over-the-counter price of a KAU20 rose from 23,200 won to 40,100 won by May 2020. As with the exchange trading price, the over-the-counter trading price subsequently fell to 15,000–25,000 won. During the trading period for KAU20, the lowest price for a KAU20 was 12,700 won (June, 2021), and the final closing price was won 21,900 (August, 2021).

〈Trading Volume and Price Trends for KAU20 in the Exchange Market〉



4) Analysis of a Survey of Covered Entities

A survey was conducted to examine the overall views on the K-ETS among covered entities, their responses to Phase Ⅱ, GHG emission reduction performance, and responses and prospects for Phase Ⅲ. A total of 636 covered entities were selected for the survey, of which 260 (40.9%) responded.

According to the survey results, 84.2% of the responding entities responded positively regarding the K-ETS, representing a positive increase from 63.9% in 2018 and 68.0% in 2019.

The internal interest in the environmental, social, and governance (ESG) management and Renewable Energy 100 (RE100) within the covered entities increased (positive: 70.0%; negative: 8.5%), and this increased interest was found to serve as an opportunity for internal innovation for new product development and process improvement.

In terms of the strategies necessary for the improvement of the K-ETS, the responding entities emphasized the expansion of allocation incentives for entities pursuing GHG reduction efforts (53.1%), presentation of consistent policies from a long-term perspective (40.0%), and financial support for the introduction of technologies for reducing GHG emissions (26.9%). This suggests that supporting covered entities to preemptively respond to the emissions trading system by expanding the institutional basis for GHG reduction and maintaining policy consistency is necessary.

The measures taken in response to the K-ETS included participation in emission permit trading (61.9%), internal investment in facilities and technologies for reducing GHG emissions (50.4%), the establishment of response strategies for reducing GHG emissions and the K-ETS (22.7%), and the use of external consulting services (21.2%). In terms of how covered entities met their obligations to surrender emission permits, the most common response was that they had met their obligation through emission permits allocated free of charge combined with other additional measures (85.8%). Other measures used included the promotion of internal emissions reduction activities (47.5%), purchase of emission permits (37.7%), and reduction in production (32.3%). The percentage of responding entities who stated that they had met their obligation to surrender emission permits through allocated emission permits alone was 9.6%.

The principal motivation of the covered entities in participating in GHG emissions reduction activities included the reduction in the purchase expenses for emission permits (68.5%) and the reduction in energy-related costs (63.8%), both of which were related to the short-term goal of reducing costs. Long-term motivations such as increasing the long-term competitiveness of the company (17.3%), improving the image of the company (15.8%), and discovering a new growth engine (4.6%) were found to be relatively low.

In terms of the actions that will be taken by the covered entities in response to the K-ETS during Phase Ⅲ, the most common response was that they will meet their obligations to surrender emission permits through the purchase of emission permits (68.0%), followed by internal emissions reduction

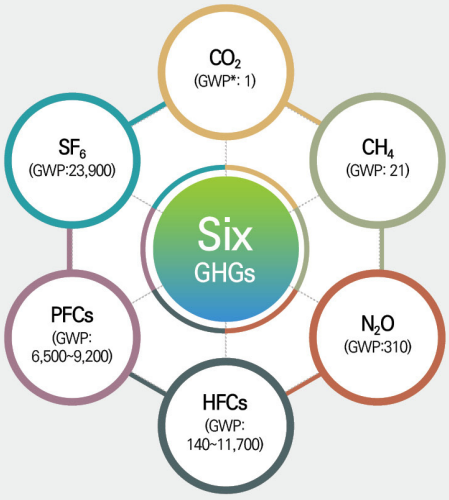
activities (39.9%) and the use of KAUs (22.4%). With respect to their plan for GHG reduction activities, the most common response was that, as in Phase Ⅱ, the responding entities will install high-efficiency facilities and improve facility performance (55.0%). Other measures included the generation of electricity using renewable energy for self-consumption (30.0%), conversion of energy sources to low-carbon fuels (26.4%), recovery and utilization of unused thermal energy (18.6%), and implementation of CCUS (5.0%).

In terms of forecasting the average emission permit price for 2022, with reference to the closing price for KAU21 on 15 September 2021 (28,500 won), 73.5% of the responding entities expected an increase, 22.3% expected a steady price, and 4.2% expected a decrease. The specific reasons for expecting an increase in the emission permit price were an insufficient emission permit allocation (61.3%) and the increase in the demand for emission permits due to an increase in production due to a booming economy (55.5%).

K-ETS at a Glance

1. K-ETS Overview

Gas Coverage



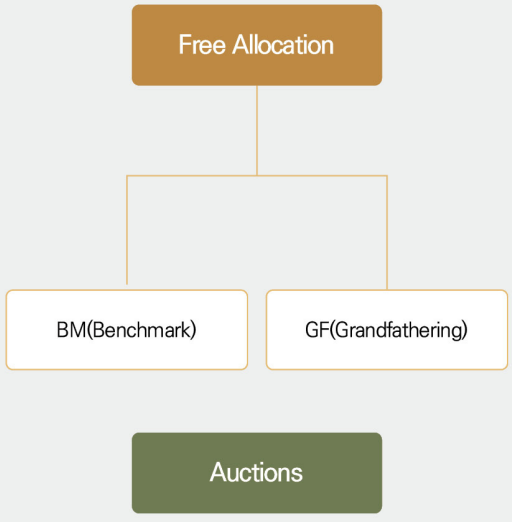
GHG emissions: direct + indirect emissions

- Direct emissions from six GHGs
- Indirect emissions from electricity consumption

* Global Warming Potential

Sector Coverage

Allocation Methods

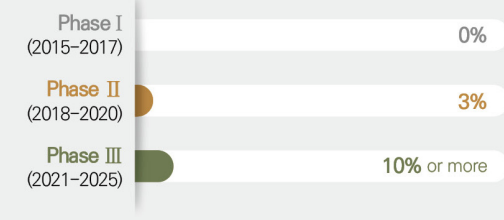


Covered Entities

Total average annual GHG emissions for the past three years

- **125,000t** or more for entities
- **25,000t** or more for business establishments

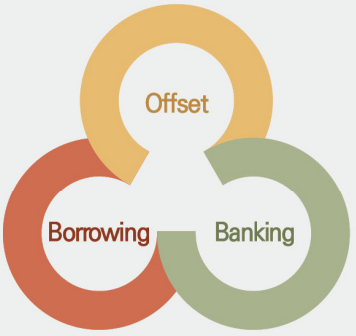
Percentage of Auctioned Emission Permits for Sectors Subject to Auctions for Each Phase



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* (Power and Other)	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



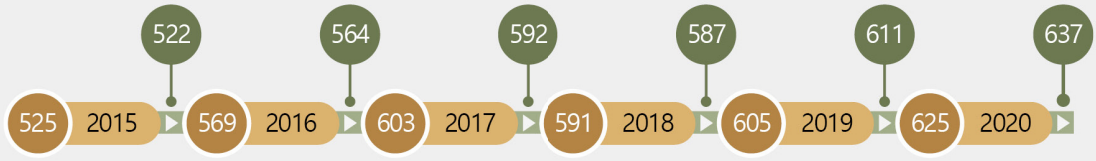
Offset	If a covered entity possesses or acquires GHG reduction credits generated outside the scope of business operations monitored by the K-ETS, it may convert all or part of them into emission permits, which can be used for trading or compliance
Banking	Surplus emission permits may be carried over to the next compliance year
Borrowing	If emission permits are insufficient to meet the surrender obligation, a portion of allocated emission permits may be borrowed from the next compliance year within a single phase

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 the 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 × 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 Entities subject to Pre-allocation and Final allocation by Compliance Year

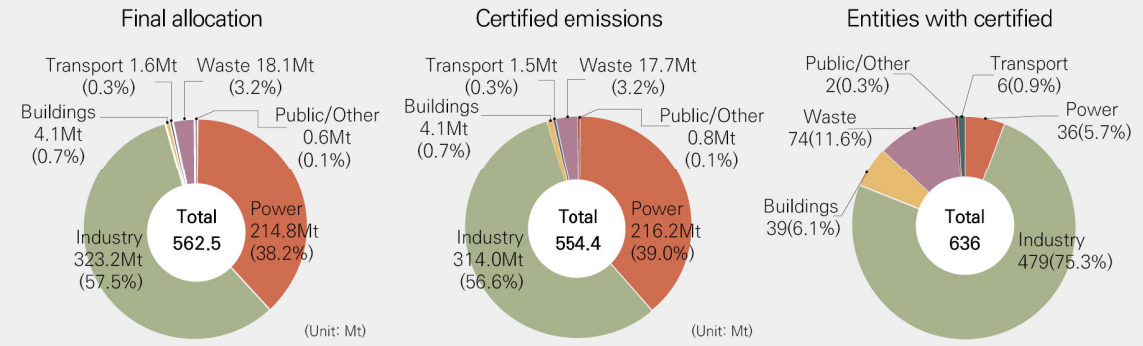


Pre-allocation entities Pre-allocation entities: number of entities designated for pre-allocation and new entry allocation before the commencement of a compliance year

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

* Refers to cases where the obligation to surrender emission permits no longer exists due to allocation revocation or mergers according to succession of rights and obligations

Distribution by Sector



Compliance Results

2015	2016	2017	2018	2019	2020
99.8% (521/522)	100% (560/560)	99.7% (589/591)	99.8% (585/586)	99.8% (609/610)	99.8% (635/636)

Trading Market Performance

Total Trading Volume grew 7 x / Average Trading Price grew 2 x / Total Payments grew 21 x from 2015 to 2020

	2015	2016	2017	2018	2019	2020
Total Trading Volume (Mt)	5.7	12.0	26.3	47.5	38.1	44.0
Average Trading Price (KRW/t)	11,013	17,056	20,951	22,120	28,440	30,411
Total Payments (100 million KRW)	624	2,041	5,503	10,509	10,831	13,385

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2020 Korean Emissions Trading System Report

PART I

K-ETS Overview

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

1 Overview of the K-ETS and Operational Direction

1.1. Overview

An emissions trading system is a market-based greenhouse gas (GHG) reduction scheme in which the government sets an emissions cap and allocates annual emissions allowances to business establishments emitting more than a certain amount of GHGs so that they can emit GHGs up to the limit set by the emissions allowances they hold. If a covered entity emits less GHG than the emission permits it secures, it can sell the surplus through market transactions. If a covered entity emits more 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 emissions allowances that were connected with the national GHG reduction targets and provided details of the operation of the K-ETS.

▶ Summary of the K-ETS Operational Results for the Second Compliance Year of Phase Ⅱ (2019)

During the 2019 compliance year in Phase Ⅱ, a total of 563.2 Mt of emissions allowances (554.7 Mt from free allocation and 8.6 Mt from auctioned allowances) were allocated to 610 entities from 62 sub-sectors. The final amount of certified emissions was 587.9 Mt, which was 24.6 Mt higher than the allocated amount. The amount of emission permits (KAU19, KCU19, and KOCs) traded in the emissions trading market until the surrender of the emission permits for 2019 (November 7, 2018-November 5, 2020) was 45.2 Mt, with a transaction value of 1,390.5 billion won. The final amount of emission permits surrendered by covered entities was 587.8 Mt (587.6 Mt of KAU19 and 0.3 Mt of KCU19). Penalties were imposed on one covered entity that failed to meet its obligation to surrender its emission permits (32.6 kt). In addition, 17.2 Mt of emission permits were carried over into the next compliance year (2020).

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

Type	Phase Ⅰ (2015-2017)	Phase Ⅱ (2018-2020)	Phase Ⅱ (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

(Source: Master Plan for the Emissions Trading System (Ministry of Economy and Finance, 2017)

For Phase Ⅱ (2018-2020), the government raised emissions reduction targets so that they were higher than the level achieved in Phase Ⅰ and gradually increased the level of reduction of GHG emissions by covered entities by expanding the scope of the K-ETS and adjusting specific emissions reduction targets to be consistent with national GHG reduction targets. 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 and announce detailed regulations for the K-ETS, including those related to 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 reflecting the new government's environmental and energy policies, and the new government subsequently announced the Allocation Plan for Phase Ⅱ: Step 2 (2018-2020) (July 2018), which reflected the amended Roadmap and added further detail to the standards, such as total emissions allowances (1,796.1 Mt), standards for auctions, and benchmark-based (hereafter "BM") 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 reasons such as the unrestricted permission for the banking of surplus emission permits within a phase. In order to solve this problem, the government

amended the Allocation Plan for Phase Ⅱ: Step 2 (2018-2020) (June 2019) and newly introduced 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 established strategies to further develop allocation methods, substantially reduce GHG emissions, and expand market functions, to further 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 emissions allowances (3,082.3 Mt), standards for free allocations and auctions, and BM allocations, was established for the implementation of these strategies.

〈Table Ⅰ-2〉 National Policies for GHG Reductions and the K-ETS

<table>
<tr><th colspan="2">Type</th><th colspan="3">Phase Ⅱ (2018-2020)</th><th>Phase Ⅲ (2021-2025)</th></tr>
<tr><td rowspan="2">National Policies for GHG Reductions</td><td>National GHG Reduction Target</td><td colspan="3">• Reduction by 37% from BAU (Business-as-usual) levels in 2030 (June 2015)</td><td>• Reduction by 24.4% of the total GHG emissions in 2017 by 2030 (December 2019)</td></tr>
<tr><td>Sectoral Implementation Plan</td><td>• Basic Roadmap for Achieving 2030 National GHG Reduction Targets (December 2016)</td><td colspan="3">• Amendment to the Basic Roadmap for Achieving 2030 National GHG Reduction Targets (July 2018)</td></tr>
<tr><td rowspan="2">GHG Emissions Trading System</td><td>Master Plan</td><td colspan="3">• Master Plan for the Emissions Trading System for Phase Ⅱ (January 2017)</td><td>• Master Plan for the Emissions Trading System for Phase Ⅲ (December 2019)</td></tr>
<tr><td>Allocation Plan</td><td>• Allocation Plan for Phase Ⅱ: Step 1 (2018-2020) (December 2017)[1)]</td><td>• Allocation Plan for Phase Ⅱ: Step 2 (2018-2020) (July 2018) [2)]</td><td>• Allocation Plan for Phase Ⅱ: Step 2 (2018-2020) amended (June 2019)[3)]</td><td>• Allocation Plan for Phase Ⅲ (2021-2025) (September 2020)[4)]</td></tr>
</table>

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 2018 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.

〈Table Ⅰ-3〉 Guidelines for the K-ETS

Type	Guidelines
Allocation· Revocation	• Guidelines for the Allocation and Allocation Revocation of GHG Emission Permits (Ministry of Environment, wholly amended in December 2020)
Reporting· Certification	• Guidelines for the Reporting and Certification of Emissions under the GHG Emissions Trading System (Ministry of Environment, partially amended in December 2021)
Verification	• Guidelines for the Verification of the Operations of the GHG Emissions Trading System (Ministry of Environment, partially amended in June 2021)
Emissions Trading	• Regulations for the Additional Allocation of Emission Permits for Auctions and Market Stabilization Measures (Ministry of Environment, partially amended in May 2020) • Notification on GHG Emissions Trading (Ministry of Environment, partially amended in May 2018) • Notification on Application Qualifications and Evaluation Standards for the Emissions Exchange (Ministry of Environment, partially amended in May 2018) • Notification on the Supervision of the Emissions Exchange (Ministry of Environment, partially amended in May 2018) • Notification on the Designation and Operations of Market Makers in the Emissions Trading Market (Ministry of Environment, partially amended January 2021) • Notification on the Designation of Market Makers for the Emissions Trading Market in 2021 (Ministry of Environment, partially amended April 2021)
Offset Mechanisms	• Guidelines for the Feasibility Assessment of External Offset Projects and the Certification of Reductions (Ministry of Environment, partially amended in May 2021)

1.2. Operation of the K-ETS in the 2020 Compliance Year

This report provides the results of an analysis of the annual emission activities of the covered entities in 2020, which was the final compliance year[4] of Phase Ⅱ, and data on the allocation and trading of emission permits until August 9, 2021. Several changes were made compared to the previous compliance year of 2019, including the implementation of market stabilization measures to stabilize the emissions trading market, designation of additional market makers, and the introduction of criteria for the conversion of KOCs into KCUs.

In accordance with Article 23 of the Act and Article 38 of the Enforcement Decree, the government may take market stabilization measures in the event concerns arise regarding the formation of stable prices for emission permits[5] through the deliberation by the Allocation Committee; these market

4) A compliance year refers to each year within a phase designated to annually allocate emission permits to entities that emit large amount of GHGs in order to achieve the national GHG reduction targets for each phase and manage the implementation of these targets.

stabilization measures include additional allocations and the establishment of the minimum and maximum number of emission permits that an entity can hold and the minimum trading price for emission permits. In the event that the average price for emission permits for the last month is less than 60% of the average price for emission permits over the immediately preceding two years, the government may establish a temporary minimum trading price for emission permits as a market stabilization measure.[6] Because the price for KAU20 sharply decreased in 2021 due to the effects of the coronavirus disease pandemic (hereafter "COVID-19"), the government set the minimum trading price for emission permits in April and June 2021 to stabilize the emissions trading market. The results of the implementation of these market stabilization measures on KAU20 are summarized in 〈Table Ⅰ-4〉. These measures were lifted after five business days, and the price of emission permits gradually increased.

〈Table Ⅰ-4〉 KAU20 Market Stabilization Measures

Type	Date	Closing Price (won/t)	Details of the Measures
1st	04-19-2021	15,700	Setting of a minimum trading price for emission permits: 12,900 won * A 10% price range limit was applied to the minimum trading price (14,300 won) between 12-16 April 2021 - (End Date) If the actual trading price of emission permits is higher than the set price by at least 10% for five consecutive days, the application of the set price ends on the following day
	04-20-2021	16,000	
	04-21-2021	16,700	
	04-22-2021	17,050	
	04-23-2021	17,750	
	04-26-2021	18,800	The application of the set minimum trading price was lifted
2nd	06-25-2021	13,700	Setting of a minimum trading price for emission permits: 9,450 won * A 10% price range limit was applied to the minimum trading price (10,500 won) between 18-24 June 2021
	06-28-2021	15,050	
	06-29-2021	14,700	
	06-30-2021	15,800	
	07-01-2021	16,000	
	07-02-2021	16,100	The application of the set minimum trading price was lifted

Source: KRX Market Information Platform for Emission permit prices (www.ets.krx.co.kr)

5) (i) If the price of emission permits exceeds for six consecutive months the average price for emission permits for the immediately preceding two years at a rate prescribed by Presidential Decree, (ii) if the trading volume substantially increases in a short period of time due to a cause or event prescribed by Presidential Decree, such as a rapid increase in demand for emission permits, (iii) if it is deemed necessary to take market stabilization measures due to any other cause or event prescribed by Presidential Decree in order to maintain order in the emissions trading market or protect the public interest.

6) If the conditions that invoke the setting of the minimum trading price are maintained for at least five consecutive days, the minimum trading price is set based on the minimum trading prices (closing prices) at which emission permits were sold for those five consecutive days (with the application of a 10% price range limit). If, after the setting of a minimum trading price, emission permits are sold at prices lower than the set minimum trading price for at least five consecutive days, the minimum trading price is adjusted based on the minimum trading prices (closing prices) at which emission permits were sold for those five consecutive days.

For the stable operation of the emissions trading market, the government introduced the market maker system from Phase Ⅱ in accordance with Article 22-2 of the Act. In May 2021, three additional financial institutions were designated as market makers, and a total of five institutions[7] participate in the emissions trading market.

The government lends emission permits (5,000-100,000t) to market makers every month from the reserve for market-making, and market makers are required to suggest the asking or bidding price for emission permits and participate in emission permit transactions.

After completing the transactions, the market makers return[8] the emission permits they have borrowed from the government in the form of cash or emission permits every month. This process was applied even in the last month of a compliance year. However, because the banking of emission permits was permitted starting in the 2020 compliance year, 1.4 Mt of emission permits were carried over to Phase Ⅲ.

〈Table Ⅰ-5〉 Legal Grounds and Standards for the Market-Making System in Phase Ⅱ

Type	Legal Grounds	Methods and Standards
Purpose	Art. 22-2 of the Act Art. 37 of the Enforcement Decree	• The competent authority designates market makers for the stable operation of the emissions trading market, such as revitalizing emissions trading, and designated market makers perform the following tasks: - Suggest asking and bidding prices for emission permits and trade emission permits.
Designa-tion	Art. 3 of the Notification	• Any entity that intends to be designated as a market maker must submit an application to the Minister of Environment no later than three months before the commencement of each compliance year (if a market maker must be designated during a compliance year, no later than two months before the date notified by the Minister of Environment on which the market-making tasks commence). • The effective period for the designation of a market maker must be one year from the date of designation. However, if a market maker is designated during a compliance year, the effective period may be extended until 31 December of the following compliance year.

7) The Korea Development Bank and the Industrial Bank of Korea were designated in 2019. SK Securities Co., Ltd., Hana Financial Investment Co., Ltd., and Korea Investment & Securities Co., Ltd. were designated in 2021.

8) If returned in the form of emission permits, they are transferred from the market maker's account to the reserve account for market-making.

Type	Legal Grounds	Methods and Standards
Assess-ment	Art. 22-2 of the Act, Art. 37 of the Enforcement Decree, Arts. 5 & 6 of the Notification	• Market makers are required to deliver to the competent authority monthly reports on their performance including the following information, and the competent authority evaluates these reports: - The amount of emission permits retained and traded by emission type. - The number and volume of transactions undertaken at the asking and bidding prices, the time of submission for the asking and bidding prices, the price range between the asking and bidding prices, and etc.
Lending and Return	Art. 7 of the Notification	• Market makers may rent all or part of the emission permits necessary for market-making from the reserve for market-making, and the competent authority may lend emission permits in different amounts taking into consideration the results of the performance assessment. • Market makers must return borrowed emission permits in the form of emission permits or equivalent cash at the end of the lending period.

Source: Act on the Allocation and Trading of Greenhouse-Gas Emission Permits and its Enforcement Decree (Ministry of Environment, Ministry of Economy and Finance, Office for Government Policy Coordination, all partially amended on March 24, 2020 and March 23, 2021), Notification on the Designation and Operations of Market Makers in the Emissions Trading Market (Ministry of Environment, partially amended on January 15, 2021)

KOCs, which are issued as a result of the certification of GHG reductions from external projects, can be converted into KCUs for surrender. Unlike KAUs and KCUs, there had been no restrictions on the trading period for KOCs. However, the relevant Notification was amended[9] in 2021 so that KOCs were tradable only for two years from the end of the year they were issued, and they should then be converted into KCUs.

9) Guidelines for the Feasibility Assessment of External Offset Projects and the Certification of Reductions (Ministry of Environment Notification No. 2021-105, partially amended on May 21, 2021).

2 Operation of the K-ETS

2.1. Cap

The cap is the total amount of GHG emissions all covered entities are allowed to emit during a phase, and this is managed by the K-ETS as the emissions target. The cap is established based on the Basic Roadmap for Achieving National GHG Reduction Targets as provided under Article 5(1) of the Act. The method of calculation used to establish the cap for Phase Ⅱ is as illustrated in 〈Figure Ⅰ-1〉. The cap for Phase Ⅱ was calculated by sector in order to ensure consistency between the K-ETS and the Basic Roadmap.[10] However, for some emission activities, the categorization was comprehensively reassessed to set separate allowances for some sub-sectors.[11]

〈Figure Ⅰ-1〉 Calculation Method for the Cap for Phase Ⅱ

Step 1	Calculate the average sectoral GHG reduction targets(the amended Roadmap, 2018) for Phase Ⅱ (2018-2020)
Step 2	Calculate the sectoral emissions coverage from the ETS* for the base years (2014-2016) * ETS emissions coverage (2014-2016) = average emissions of the covered entities (2014-2016) / average national emissions (2014-2016)
Step 3	Calculate the sectoral ETS cap* for Phase Ⅱ (2018-2020) * Sectoral ETS cap (2018-2020) = average sectoral reduction targets (2018-2020) × ETS emissions coverage (2014-2016)
Step 4	Calculate the overall ETS cap for Phase Ⅱ (2018-2020) (i.e., summing the cap for each sector)

Total emissions allowances consist of the cap and a reserve established separately from the cap. The reserve is divided into (ⅰ) market stabilization measures, (ⅱ) market-making and liquidity management, and (ⅲ) other purposes (power and other than power).[12] The reserve for market

10) Sub-sectors: Power generation, integrated energy supply (residential), integrated energy supply (industrial), food and beverages, textiles, wood, pulp, oil refining, petrochemicals, glass, ceramics, cement, steel, nonferrous metals, machinery, semiconductors, displays, electrical and electronics, automobiles, shipbuilding, telecommunications, buildings, aviation, waste, and water. Sectors: Industry, power, buildings, transport, waste, and public services/other sectors.

11) Factors such as the scale of emissions for a relevant emission activity, differences in emission characteristics or reduction capacities between sectors, the proportion of a relevant activity's emissions in comparison to total emissions for a relevant entity, and the possibility of categorization as specified in Article 24 of the Act and Article 44 of the Framework Act on Low Carbon and Green Growth were comprehensively considered

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

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.

The reserve for (ⅰ) market stabilization measures and (ⅱ) market-making and liquidity management are set aside for the purpose of lending emission permits to market makers or when abnormalities occur in the emissions trading market. The reserve for (ⅲ) other purposes is allocated for new entry, additional allocation, and objection applications. The total emissions allowances for Phase Ⅱ were set at 1,796.1 Mt, made up of the cap (1,777.1 Mt) and a reserve (19.0 Mt).[13)]

〈Table Ⅰ-6〉 Total Emissions Allowances for Phase Ⅱ

(Unit: Mt)

Type			2018	2019	2020	Total Amount (2018-2020)
Total Emissions Allowances			-	-	-	1,796.1
Reserve	Market Stabilization Measures		-	-	-	14.0
	Market Making		-	-	-	5.0
	Reserve for Other Purposes	Power	-	-	-	78.3
		Other than Power	-	-	-	55.8
Pre-Allocation			547.7	547.7	547.7	1,643.0
Power Sector	Subtotal		228.1	228.1	228.1	684.2
	Power sector in general		199.9	199.9	199.9	599.7
	Steam, chilled, or hot water and air conditioning supply (Power sector)[1)]		10.8	10.8	10.8	32.4
	By-product gas-generating business establishment (electric power generation, transmission, and distribution)		17.1	17.1	17.1	51.2
	Fugitive emissions (manufacture of gas and distribution of gaseous fuel through the mains)[2)]		0.3	0.3	0.3	0.8
Industry Sector	Subtotal		296.9	296.9	296.9	890.7
	Industry sector in general		274.4	274.4	274.4	823.3
	Steam, chilled, or hot water and air conditioning supply (industry sector)[1)]		13.3	13.3	13.3	40.0
	Fugitive emissions (mining of coal)[3)]		0.4	0.4	0.4	1.2

those that are non-power-related.

13) Cap (1,777.1 Mt) = Pre-allocation (1,643.0 Mt) + Reserve for Other Purposes (Power: 78.3 Mt, Other than Power: 55.8 Mt)
Reserve Separate from Cap = Market Stabilization Measures (14.0 Mt) + Market-Making (5.0 Mt)

Type		2018	2019	2020	Total Amount (2018–2020)
	Process emissions from lime production (manufacture of ceramics and other ceramic products, and manufacture of cement, lime, and plaster)[4]	2.9	2.9	2.9	8.8
	Process emissions of F-gas related to magnesium production (manufacture of basic iron and steel)[5]	0.1	0.1	0.1	0.3
	Process emissions of F-gas related to semiconductor and photoelectric cell productions (manufacture of semiconductors, manufacture of electronic components, and manufacture of domestic appliances)[6]	3.2	3.2	3.2	9.7
	Process emissions of F-gas related to display production (manufacture of semiconductors, and manufacture of electronic components)[7]	2.5	2.5	2.5	7.4
Buildings Sector		4.0	4.0	4.0	12.1
Transport Sector		2.0	2.0	2.0	6.0
Waste Sector		16.0	16.0	16.0	48.0
Public Services/Other Sectors		0.7	0.7	0.7	2.0

1) In accordance with the objectives of the revision of the First Allocation Plan of 2017, separate allowances are set and maintained for the "Integrated energy supply (residential)" and "Integrated energy supply (industrial)" sub-sectors.
   - To set the allowances, business entities falling under "Steam, chilled, or hot water and air conditioning supply" (KSIC code 353) in the power sector are categorized as "Integrated energy supply (residential)," and those falling under "Steam, chilled, or hot water and air conditioning supply" (KSIC code 353) in the industrial sector are categorized as "Integrated energy supply (industrial)."

2)–7) Refer to the Annex 16 Form of the Guidelines on GHG and Energy Target Management and the Annex 10 Form of the Guidelines on Certification of Emissions.

2) Emission activities falling under "Fugitive emissions (natural gas system)" (Emission activity code 3003).

3) Emission activities falling under "Fugitive emissions (extraction of coal)" (Emission activity code 3001) and "Fugitive emissions (processing and storage of coal)" (Emission activity code 3002).

4) Emission activities falling under "Mining industry (lime production)" (Emission activity code 4002).

5) Emissions arising from the use of F-gas from those emission activities falling under "Metal industry (magnesium production)" (Emission activity code 4098).

6) Emission activities falling under "Electronics industry (semiconductor)" (Emission activity code 4025), "Electronics industry (photoelectric cell)" (Emission activity code 4027), "Other emissions (other process emissions)" (Emission activity code 4099), and "Other emissions (other GHG emissions)" (Emission activity code 7001).

7) Emission activities falling under "Electronics industry (display)" (Emission activity code 4026), "Other emissions (other process emissions)" (Emission activity code 4099), and "Other emissions (other GHG emissions)" (Emission activity code 7001).

Source: Amended Allocation Plan for Phase Ⅱ: Step 2 (2018-2020) (Ministry of Environment, 2019)

2.2. Designation of Covered Entities

Pursuant 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 CO_2-eq or entities having 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 CO_2-eq are designated as covered entities. The number of covered entities for Phases Ⅰ-Ⅲ is as shown in 〈Table Ⅰ-7〉.

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.

〈Table Ⅰ-7〉 Number of Covered Entities under the K-ETS

Phase	Year	Pre-allocation	New entry	Additional allocation	Allocation revocation	Succession of rights and obligations		Reallocation[1]	Final allocation[2]	Certified emissions[3]
						Transfer	Acquisition			
Ⅰ	2015	525	-	63	211	23	24	-	522	522
	2016	525	44	161	249	35	36	-	564	560
	2017	525	78	337	269	56	54	434	592	591
Ⅱ	2018	591	-	242	224	17	19	-	587	586
	2019	587	18	266	250	39	46	-	611	610
	2020	604	21	232	300	64	72	-	637	636
Ⅲ[4]	2021	684	-	-	45	17	15	-	-	-

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 entities whose final allocation was more than 0

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

4) As of October 2021

2.3. 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 by compiling GHG emission activities undertaken during the relevant compliance year (1 January–31 December). This report must be verified by an external verifying institution and submitted to the government together with a verification report from the verifying 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 six 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 or borrowing emission permits or using carried over emission permits, while, if the amount of emission permits exceeds the amount of certified emissions, they can sell or bank the surplus emission permits. 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 〈Table Ⅰ-8〉.[14)]

14) 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 January–31 December). However, emission permits for free allocation are registered before the commencement of a compliance year, and these emission permits can be traded from the date of registration until the date of surrender. Accordingly, emission permits allocated for and traded in the 2020 compliance year refer to those allocated and traded between November 7, 2020 (after the registration of the amount of emission permits) and August 8, 2021 (the date for the surrender of emission permits).

〈Table Ⅰ-8〉 Operating Schedule for the K-ETS

Timeline	Division	Details
1 Year before Phase	Government	Establishes the Master Plan for the Emission Trading System
6 Months before Phase	Competent Authority	Establishes the Allocation Plan
5 Months before Phase	Competent Authority	Designates and publicly notifies covered entities
4 Months before Phase	Covered Entity → Competent Authority	Submits an application for the allocation of emission permits
2 Months before Phase	Competent Authority	Provides notification of the amount of allocated emission permits
1 Month before Compliance Year	Competent Authority	Designates and publicly notifies market makers (or one month before the initial designation)
1 Month before Compliance Year	Competent Authority	Announces the Annual Auction Plan
Compliance Year (1 Jan.-31 Dec.)	Covered Entity	Emission activities
3 Months after Compliance Year	Covered Entity → Competent Authority	Submits a GHG Emissions and Energy Usage Report
3 Months after Compliance Year	Covered Entity → Competent Authority	Applies for additional allocation
5 Months after Compliance Year	Competent Authority → Covered Entity	Determines whether to provide additional allocation, provides notification on the certification of emissions
10 Days after the Notification of Certification Results	Covered Entity → Competent Authority	Applies for banking / borrowing of emission permits
10 Days before the Deadline for Surrender	Competent Authority → Covered Entity	Reviews and approves the application for banking / borrowing
6 Months after Compliance Year	Covered Entity → Competent Authority	Surrenders emission permits in an amount equivalent to the amount of certified emissions

Phase Ⅱ I 2018-2020

2020 Korean Emissions Trading System Report

PART Ⅱ

K-ETS Operational Results

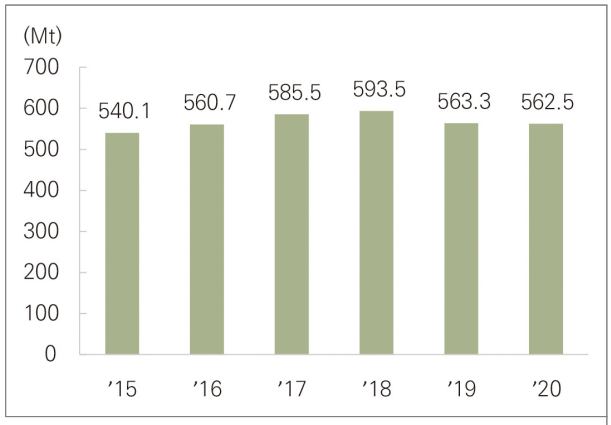
1. Allocation of Emission Permits
2. Certification and Surrender of Emission Permits

1 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.[15] Because auctions were introduced in Phase Ⅱ, meaning that a number of covered entities were now in sub-sectors subject to auctions, 3% of the total allocation was deducted from the pre-allocation amount and set aside for purchase by covered entities through auctions in the emissions trading market.

In the 2020 compliance year, the amount of emission permits set for pre-allocation was 530.7 Mt, while the final allocation amount, which reflected a number of changes (e.g., new entrants, additional allocation, allocation revocation, and succession of rights and obligations) that occurred in that compliance year, was 562.5 Mt (637 entities). Unlike the yearly increase in the final allocation amount observed in the 2016 and 2017 compliance years during Phase Ⅰ compared to previous years (3.8% and 4.4%, respectively), during Phase Ⅱ, the final allocation amount in 2019 decreased by 5.1% compared to 2018 and the final allocation amount in 2020 decreased by 0.2% compared to 2019.

〈Figure Ⅱ-1〉 Final Allocation by Year



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

(Unit: Mt)

Phase	Year	Final allocation	Annual change	No. of 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

(Source) Emissions Trading Registry System (ETRS) Database (as of November 2021)

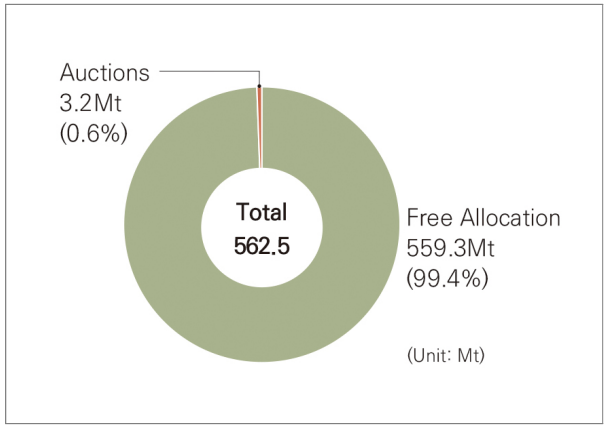
* All entities with the final allocation larger than 0, including merged entities according to succession of rights and obligations, are included. For this reason, the number of entities has changed from the previous report (610 entities)

15) The pre-allocation amount specified (in the Allocation Plan for Phase Ⅱ: Step 2) in Chapter I of this report is the amount set for allocation for each compliance year, and the pre-allocation amount specified in Chapter Ⅱ is the amount that the covered entities are notified of by the competent authority in response to their allocation applications (the pre-allocation amount in this chapter refers to the amount pre-allocated for free, with the amount for auction transferred to a separate account).

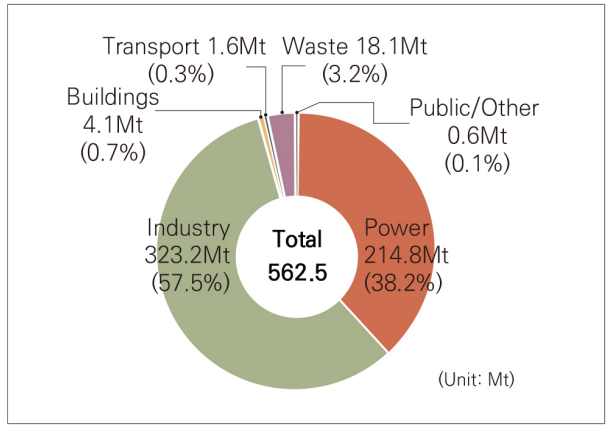
The allocation methods used in Phase Ⅱ consisted of grandfathering, under which emission permits were allocated based on past GHG emissions, and benchmarking, under which emission permits were allocated based on each entity's previous emissions in comparison to its activity data, such as its product output, taking into consideration the efficiency of its facilities. During Phase Ⅰ, the grandfathering method of allocation was used for the majority of sub-sectors, while benchmarking was applied only to three sub-sectors (cement, oil refining, and aviation). During Phase Ⅱ, benchmarking-based allocation was applied to seven sub-sectors (power generation, integrated energy supply [residential and industrial], waste, and the three sub-sectors from Phase Ⅰ).

For the 2020 compliance year, 530.7 Mt of allowances were originally allocated to 604 entities, but the number of entities increased because some entities that took over the rights and obligations of other covered entities were designated as covered entities (caused by, for example, the splitting of covered entities) and 21 covered entities were newly designated (9.0 Mt). As a result, the number of covered entities subject to the final allocation increased by 33 from 604 to 637. Broken down by sector, the final allocation was 323.2 Mt for industry (57.5%), 214.8 Mt for power (38.2%), 18.1 Mt for waste (3.2%), 4.1 Mt for buildings (0.7%), 1.6 Mt for transport (0.3%), and 0.6 Mt for public services and other sectors (0.1%).

〈Figure Ⅱ-2〉 Free Allocation and Auctions in 2020



〈Figure Ⅱ-3〉 Final Allocation by Sector in 2020



Information on the sector-specific final allocation of emission permits for 2020 is described in 〈Table Ⅱ-2〉. The final allocation amount (562.5 Mt) consisted of 559.3 Mt of free allocation (99.4%) and 3.2 Mt of auctioned allowances (0.6%). The amount provided for free allocation included a pre-allocation amount of 530.7 Mt (94.3%) and allocation changes of 28.6 Mt (5.1%), which resulted from new entry, 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 6.0%, which was lower than the previous year by 11.6%. Broken down by sector, the rate of change was 8.3% for industry, 2.5% for power, 2.0% for buildings, -17.5% for transport, 11.7% for waste, and 0.03% for public services and other sectors.

〈Table Ⅱ-2〉 Final Allocation by Sector for 2020

(Unit: Mt)

Sector	Final Allocation (E=C+D)										Change (E-A)/A
		Free Allocation (C=A+B)								Auctions (D)	
			Pre-Allocation (A)	Allocation Changes (B)[1]							
					New Entry	Additional Allocation	Allocation Revocation	Succession of Rights and Obligations			
								Transfer	Acquisition		
Industry	323.2	323.0	298.4	24.6	2.4	16.1	-8.6	-17.7	32.5	0.2	8.3%
Power	214.8	211.8	209.5	2.3	6.4	19.5	-8.7	-15.6	0.9	3.0	2.5%
Buildings	4.1	4.1	4.0	0.05	0.1	0.2	-0.3	-0.1	0.1	0.03	2.0%
Transport	1.6	1.6	1.9	-0.3	-	0.1	-0.4	-0.0003	-	-	-17.5%
Waste	18.1	18.1	16.2	1.9	0.2	2.1	-0.3	-	-	-	11.7%
Public/ Other	0.6	0.6	0.6	0.0002	-	0.002	-0.001	-	-	-	0.03%
Total	562.5	559.3	530.7	28.6[1]	9.0	38.0	18.4	33.4	33.4	3.2	6.0%
No. of Entities	637[2]	637	604		21	232	300	64	72	13	5.5%

1) Allocation Changes (B) = New Entry + Additional Allocation + Allocation Revocation + Succession of Rights and Obligations (Transfer) + Succession of Rights and Obligations (Acquisition); there was no change in the allocation amount caused by allocation adjustments.

2) Pre-allocation allowances were allocated to 604 entities, but the number of covered entities at the time of the final allocation increased to 637 due to new entries (21 entities) and changes (e.g., allocation revocation, succession of rights and obligations) that occurred during the compliance year.

Source: Emissions Trading Registry System (ETRS) Database (as of November 2021)

2 Certification and Surrender of Emission Permits

2.1. Certification of Emissions

Of the 637 entities to which emission permits were finally allocated in the 2020 compliance year, 636 were notified of their certified emissions because one entity was no longer obligated to surrender its emission permits after merging with another entity. According to the results of the government's evaluation of the validity of the entities' GHG Emissions and Energy Usage Report, the certified emissions amounted to 554.4 Mt, which was 5.7% (33.5 Mt) lower than the previous year.

〈Figure Ⅱ-4〉 Certified Emissions by Year

〈Table Ⅱ-3〉 Certified Emissions by Year

(Unit : Mt)

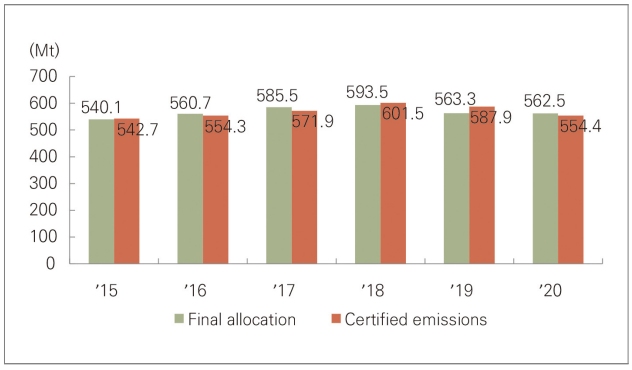
Phase	Year	Certified emissions	Annual change	No. of entities
Ⅰ	'15	542.7	-	522
	'16	554.3	2.2%	560
	'17	571.9	3.2%	591
Ⅱ	'18	601.5	5.2%	586
	'19	587.9	-2.3%	610
	'20	554.4	-5.7%	636

(Source) Emissions Trading Registry System (ETRS) Database (as of October 2021)

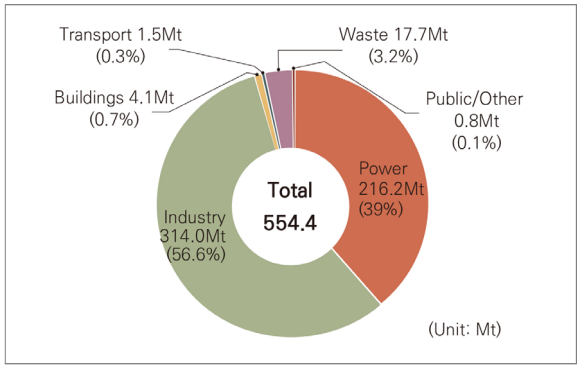
〈Figure Ⅱ-5〉 and 〈Figure Ⅱ-6〉 show the results of the comparison between the final allocations and certified emissions for each compliance year, and the certified emissions for 2020 by sector, respectively. The difference between the final allocation and the certified emissions for 2020 was 8.1 Mt. Unlike the 2018 and 2019 compliance years, the final allocation exceeded the certified emissions.

Broken down by sector, the emissions from the industry sector were 314.0 Mt (56.6%), compared to 216.2 Mt (39.0%) for the power sector, 17.7 Mt (3.2%) for waste, 4.1 Mt (0.7%) for buildings, 1.5 Mt (0.3%) for transport, and 0.8 Mt (0.1%) for public services/other sectors.

〈Figure Ⅱ-5〉 Final allocation and Certified emissions by Year



〈Figure Ⅱ-6〉 Certified emissions by sector in 2020



2.2. Surrender of Emission Permits

Covered entities must surrender their emission permits in an amount equivalent to their amount of certified emissions to the government within six 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. The liquidity of the emissions trading market is safeguarded by market-maker transactions, which allow covered entities to obtain additional emission permits without undertaking inter-entity trading.

The amount of emission permits surrendered in the 2020 compliance year was 554.4 Mt, which was equal to the amount of certified emissions for 2020. However, one entity (5.4 kt) failed to fulfill its obligation to surrender its emission permits, thus, of the 636 entities that had been notified of their certified emissions, 635 entities fulfilled their obligation to surrender their emission permits.

Broken down by the type of emission permit, KAUs accounted for 553.7 Mt (99.9%) and KCUs for 0.7 Mt (0.1%), which indicates that most of the emission permits surrendered were KAUs. The amount of KCUs surrendered increased by 0.3 Mt compared to the previous year, but the amount surrendered during Phase Ⅱ (a total of 1.5 Mt) was 90% lower than the amount during Phase Ⅰ (a total of 15.4 Mt). In addition, 17.2 Mt (437 entities) of the emission permits banked from the previous compliance year (2019) was used in the trading and surrendering of emission permits and, after the surrendering, 17.9 Mt (499 entities) of the emission permits were carried over to the following

compliance year (2021). No emission permit was borrowed from 2021 because, for the final compliance year within a phase, borrowing from the first compliance year in the subsequent phase is not permissible.

Pursuant to Article 33 of the Act, penalties will be imposed on the entity that failed to fulfill its obligation to surrender its emission permits, while surplus emission permits for 17 entities amounting to 29,000 t (the amount not carried over[16]) expired.

〈Table Ⅱ-4〉 Surrender Results by Sector in 2020

(Unit : Mt)

Sector	Certified		Carried over from '19 to '20	KOC → KCU	KAU Traded[1]		Surrendered			Not Surrendered	Not Banked	Carried over from '20 to '21		
	No. of Entities	Emissions			Sold	Purchased	(A+B)	KAU (A)	KCU (B)			(C+D)	KAU (C)	KCU (D)
Industry	479	314.0	10.9	0.4	-20.1	15.1	314.0	313.6	0.4	-0.01	0.03	10.3	10.3	0.0001
Power	36	216.2	4.5	0.2	-14.5	19.3	216.2	215.9	0.2	-	-	4.6	4.6	-
Buildings	39	4.1	0.3	-	-0.2	0.2	4.1	4.1	-	-	0.00002	0.3	0.3	-
Transport	6	1.5	0.2	-	-0.2	0.1	1.5	1.5	-	-	-	0.1	0.1	-
Waste	74	17.7	1.4	0.1	-1.3	0.9	17.7	17.7	0.1	-	-	1.2	1.2	-
Public/ Other	2	0.8	0.01	-	-	0.2	0.8	0.8	-	-	-	-	-	-
Market maker[2]	5	-	-	-	-1.4	2.0	-	-	-	-	-	1.4	1.4	-
Total	636	554.4	17.2	0.7	-37.7	37.7	554.4	553.7	0.7	-0.01	0.03	17.9	17.9	0.0001
No. of Entities	636	-	437	8	344	277	635	635	9	1	17	499	499	1

1) There has been no record of the actual trading of KCUs since the 2017 compliance year. The entries are based on the trading volume registered in the Emissions Trading Registry System (ETRS), which might be different from the trading volume of KAUs specified under Part Ⅲ (based on Korea Exchange data).

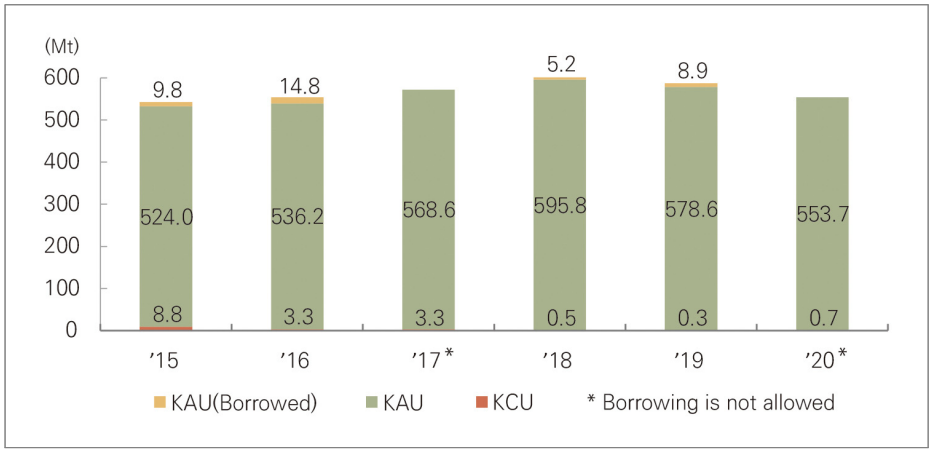
2) Market makers are not counted as covered entities.

※ Unlike the corresponding table from the previous year's report, which was prepared based only on the covered entities that had been notified of their certified emissions, the above table was prepared based on all covered entities so that all of the changes (carried-over or traded emission permits) and the number of entities for the 2020 compliance year could be reflected.

Source: Emissions Trading Registry System (ETRS) Database (as of October 2021)

16) 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.

〈Figure Ⅱ-7〉 Surrendered Emission Permits by Year



2.3. Emissions Trading

Emission permits can be traded through the exchange and using over-the-counter transactions. The tradable permits are KAUs, KCUs, and KOCs. Exchange trading commences with the listing of tradable permits on the Exchange market,[17] and ends with the delisting of these emission permits; accordingly, different trading periods apply to each type of permit in exchange trades. As a result, KAU20 was traded between 7 November 2018 and 9 August 2021, and KCU20 was traded between 16 September 2019 and 9 August 2021. On the other hand, for over-the-counter trading, there are generally no restrictions on tradable permits or the trading period, and emission permits are traded based on contracts directly entered into between covered entities. Only the results of the exchange and over-the-counter trades of KAU20 and KCU20 are discussed here because a detailed analysis of the emissions trading is provided in Part Ⅲ. KOCs are also tradable but excluded from the analysis because they are not eligible for surrender.

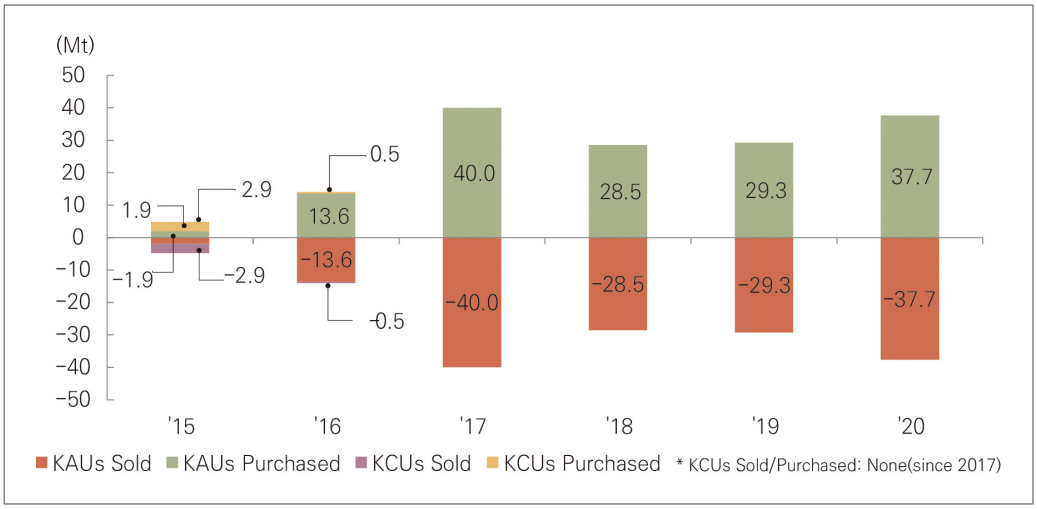
The trading volume for KAU20 (excluding the amount auctioned) was 37.7 Mt, which was 28.6% higher than the trading volume for KAU19 (29.3 Mt).[18] It is assumed that the trading volume for KAUs was higher in 2020 compared to 2019 because borrowing from 2021 was not permissible as 2020

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

18) Whereas the previous year's report was prepared based on the trading volume for the KAUs of covered entities that had been notified of their certified emissions, this report was prepared based on the trading volume for the KAUs of all covered entities that received a pre-allocation amount of emission permits so that all of the changes (carried-over or traded KAUs) and the number of entities for the given compliance year could be reflected. As a result, the amount of KAUs sold in 2019 specified in the previous year's report (-29.1 Mt) is different from the amount specified in this report.

was the final compliance year within Phase Ⅱ; a similar trend was observed during Phase Ⅰ (Figure Ⅱ-8). There have been no KCU transactions undertaken since the 2017 compliance year.

〈Figure Ⅱ-8〉 Trading volume for Emission permits by Year



Broken down by sector, 20.1 Mt (53.4%) of KAU20 was sold by the industry sector, 14.5 Mt (38.4%) by power, 1.4 Mt (3.7%) by market makers, 1.3 Mt (3.4%) by waste, 0.2 Mt (0.6%) by buildings, and 0.2 Mt (0.5%) by transport. In addition, 19.3 Mt (51.2%) of KAU20 was purchased by the power sector, 15.1 Mt (40.0%) by industry, 2.0 Mt (5.2%) by market makers, 0.9 Mt (2.4%) by waste, 0.2 Mt (0.6%) by buildings, 0.2 Mt (0.4%) by public services/other sectors, and 0.1 Mt (0.2%) by transport.

Similar to the previous year, in the power sector, the proportion of KAUs purchased (51.2%) exceeded the amount of KAUs sold (38.4%), and in the industry sector, the proportion of KAUs sold (53.4%) exceeded the amount of KAUs purchased (40.0%).

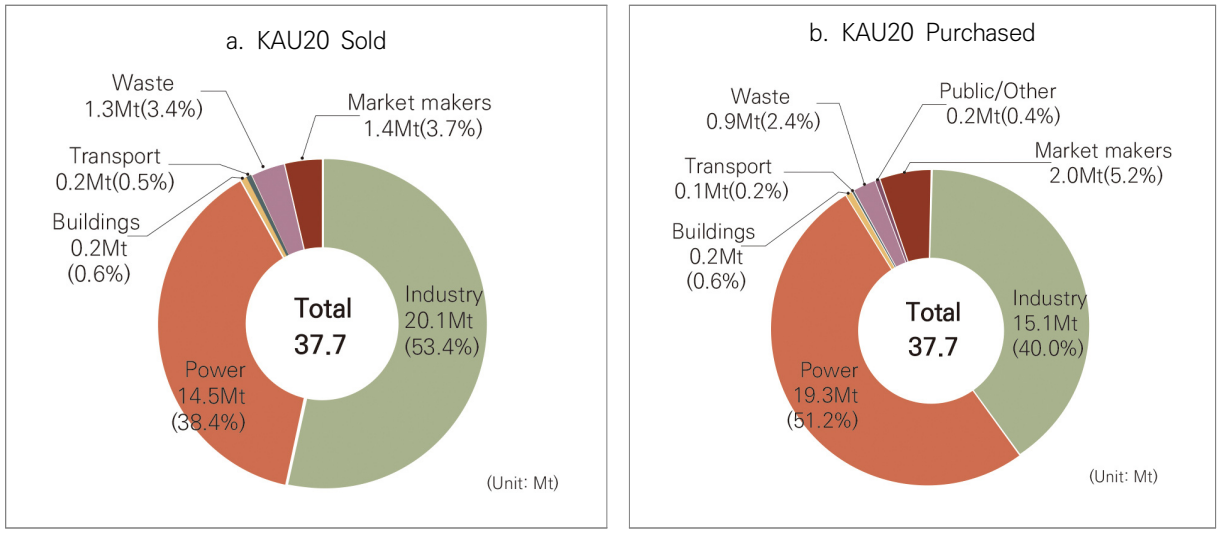
Unlike the previous year, the proportion of KAUs purchased by market makers (0.4% → 5.2%) exceeded the amount of KAUs sold (7.7% → 3.7%). For every month in 2020, approximately 5,000–100,000 t of KAUs was lent to market makers from a reserve for market making (a total of 1.5 Mt).[19] Of this, 1.4 Mt was sold, and 2.0 Mt was purchased. At the end of the lending period, 1.5 Mt was returned in the form of emission permits (0.7 Mt) and cash (0.8 Mt).[20]

19) August 31, 2020–July 30, 2021.

20) Of the revenue generated from the selling of emission permits, the payments for emission permits, excluding transaction fees for financial institutions, are returned to the government.

The trading volume for KAU20 by sector is addressed in detail in Part Ⅲ.

〈Figure Ⅱ-9〉 Amount of KAU20 Traded by Sector in 2020



2.4. Flexibility Mechanisms

Flexibility mechanisms are a means to ensure flexibility in the surrendering of emission permits by covered entities that minimize the cost of reducing GHG emissions. The flexibility mechanisms permitted by the government include the use of KCUs obtained from the conversion of KOCs and the borrowing or banking of emission permits.

2.4.1. Use of KCUs

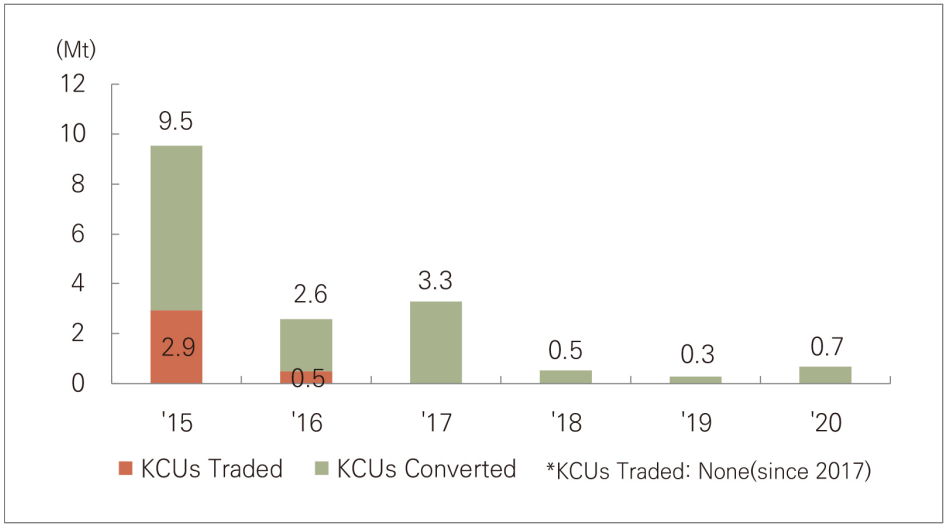
In the period between the introduction of the K-ETS and the 2020 compliance year (January 1, 2015-August 9, 2021), KOCs obtained from domestic and overseas external offset projects totaling 32.7 Mt[21] were registered. The certification of GHG emission reductions from overseas external offset projects was first introduced during Phase Ⅱ and, for the first time, a total of 1.0 Mt of overseas external offset project-based KOCs were issued in the 2020 compliance year. In 2020, the amount of KOCs obtained from domestic external offset projects was 2.3 Mt. A total of 16.9 Mt[22] was converted from KOCs to KCUs during Phase Ⅰ and Phase Ⅱ. The amount converted to KCUs in the

21) 32.7 Mt = 22.5 Mt from Phase Ⅰ (January 1, 2015-August 9, 2018) + 10.3 Mt from Phase Ⅱ (August 10, 2018-August 9, 2021).
22) 16.9 Mt = 15.4 Mt from Phase Ⅰ + 1.5 Mt from Phase Ⅱ.

2020 compliance year was 0.7 Mt, all of which were used in surrendering emission permits (nine entities, which accounted for 0.1% of all emission permits surrendered).

After the completion of the 2020 compliance year, 15.9 Mt of KOCs are not converted into KCUs (as of October 2021). Because the trading period for KOCs has been limited since 2021, the KOCs were renamed KOC20-22 and KOC21-23. A total of 13.6 Mt of KOC20-22 is tradable by 2022, and a total of 2.2 Mt of KOC21-23 is tradable by 2023.

〈Figure Ⅱ-10〉 KCUs Converted and Traded by Year

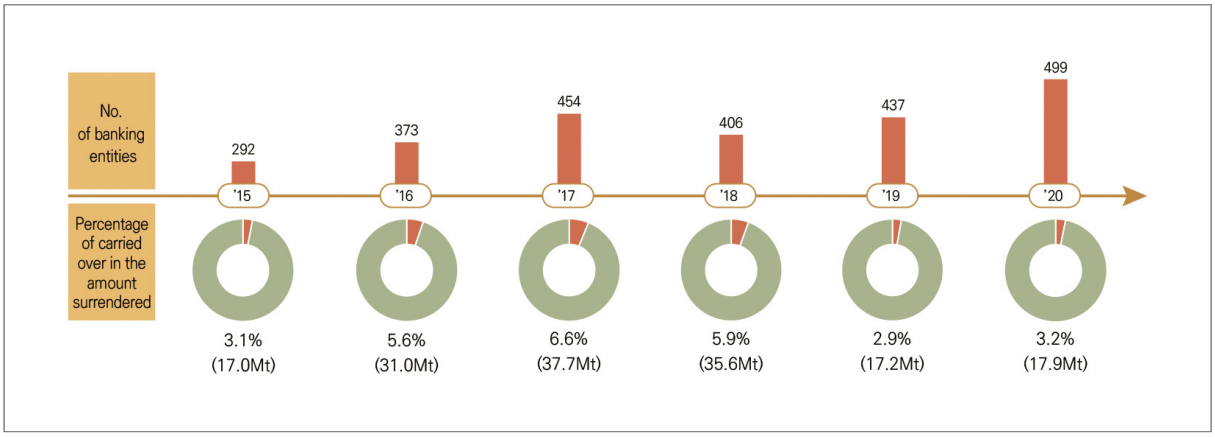


2.4.2. Banking of Emission Permits

In terms of banking, 17.2 Mt (437 entities) of emission permits were carried over from the 2019 compliance year to 2020 and used for either trading or surrendering in 2020. After the surrender for 2020, 17.9 Mt[23] (499 entities) of surplus emission permits, which are slightly higher than the previous year, were carried over to the next compliance year (2021).In terms of the amount of emission permits carried over between compliance years within a phase, the amount during Phase Ⅱ (a total of 70.7 Mt) was lower than the amount during Phase Ⅰ (a total of 85.8 Mt) by 17.6%. The banking of emission permits by market makers has been permitted since the 2020 compliance year, and 1.4 Mt were carried over to 2021 by three institutions.

23) 17.9 Mt of KAUs (499 entities) and 65 t of KCUs (1 entity).

〈Figure Ⅱ-11〉 Emission Permits Carried over by Year



2.4.3. Borrowing of Emission Permits

In the final compliance year within a phase, borrowing from the first compliance year in the subsequent phase is not permitted.

〈Table Ⅱ-5〉 Legal Grounds and Standards for the Flexibility Mechanisms in Phase Ⅱ

Type	Legal Grounds	Methods and Standards
Use of KCUs	Act Art. 29 Enforcement Decree Art. 47	• 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 those into KCUs for trading and surrendering of emission permits, etc. • KCUs are allowed up to 10% of the total amount of emission permits surrendered.
Borrowing	Act Art. 28 Enforcement Decree Art. 45	• When there is a deficit of emission permits to be surrendered, a portion of allocated emission permits from a different compliance year within a single phase may be borrowed. 〈Borrowing Limits for Emission Permits in Phase Ⅱ〉 - 1st compliance year: no more than 15% of the emission permits to be surrendered - 2nd compliance year: (up to) emission permits to be surrendered × {borrowing limit in the first compliance year(i.e.15%) - (ratio of borrowed emission permits in the first compliance year × 0.5)} - 3rd compliance year: borrowing from the subsequent phase is not allowed.
Banking	Act Arts. 28 and 32 Enforcement Decree Art. 37 Allocation plan	• covered entities may carry over emission permits in their possession to the next compliance year within the same phase or to the first compliance year in the subsequent phase. 〈Within a Single Phase〉 • 1st compliance year: Banking is approved in any of the following amounts, whichever

Type	Legal Grounds	Methods and Standards
		is greater: – Three times the net amount of emission permits sold* by a covered entity in the first compliance year * The amount of KAUs/KCUs sold minus the amount of KAUs/KCUs purchased (excluding the amount auctioned) within the compliance year (from the day of allocation for the first compliance year to the covered entity to the day before the covered entity applied for the banking of emission permits to the second compliance year) ※ However, with respect to the first compliance year, ① the amount purchased (trading + auction) before the determination of the Allocation Plan may be carried over, and ② the amount purchased before the determination of the Allocation Plan is excluded from calculating the net amount sold – 75,000 KAUs for designated entities whose annual average emissions for the base year are no less than 125,000 tCO_2eq, and 15,000 KAUs for designated entities whose business establishments produce emissions of no less than 25,000 tCO_2eq • 2nd compliance year: Banking is approved in any of the following amounts, whichever is greater: – Twice the net amount of emission permits sold* by a covered entity in the second compliance year * The amount of KAUs/KCUs sold minus the amount of KAUs/KCUs purchased (excluding the amount auctioned) within the compliance year (from the day of allocation for the second compliance year to the covered entity to the day before the covered entity applied for the banking of emission permits for the third compliance year) – 50,000 KAUs for designated entities whose annual average emissions for the base year are no less than 125,000 tCO_2eq, and 10,000 KAUs for designated entities whose business establishments produce emissions of no less than 25,000 tCO_2eq 〈Across Phases〉 • Carrying over is approved in any of the following amounts, whichever is greater. Only carrying over to the first compliance year of Phase Ⅲ is allowed. – Annual average net amount of emission permits sold* by a covered entity in Phase Ⅱ * (amount of KAUs/KCUs sold – amount of KAUs/KCUs purchased) ÷ the number of compliance years in Phase Ⅱ applicable to the covered entity (from the day of allocation for Phase Ⅱ to the covered entity to the day before the covered entity applied for the banking of emission permits for Phase Ⅲ) – 25,000 KAUs for designated entities whose annual average emissions for the base year are no less than 125,000 tCO_2eq, and 5,000 KAUs for designated entities whose business establishments produce emissions of no less than 25,000 tCO_2eq • Emission permits not carried over to the next compliance year automatically expire six months after the date of completion of each compliance year.

(Source) Act on the Allocation and Trading of Greenhouse-Gas Emission Permits and its Enforcement Decree (Ministry of Environment, Ministry of Economy and Finance, Office for Government Policy Coordination, partially amended in 2020), Amended Allocation Plan for Phase Ⅱ: Step 2 (Ministry of Environment, 2019)

Phase Ⅱ I 2018-2020

2020 Korean Emissions Trading System Report

PART Ⅲ

Analysis of the Emissions Trading Market

1. Trading Records for 2015–2021
2. Trading Records for the 2020 Compliance Year of Phase Ⅱ

1 Trading Records for 2015–2020

In Part Ⅲ, trading records for KAUs (KAU15–KAU20), KCUs (KCU15 and KCU16), and KOCs traded on the exchange market and the over-the-counter (OTC) market during Phases Ⅰ and Ⅱ (January 1, 2015–August 9, 2021) are analyzed. The analysis of KCUs and KOCs was based solely on records of exchange and over-the-counter transactions, while the analysis of KAUs was based on records of exchange and over-the-counter transactions and on auction results.

1.1. Trading Volume and Price Trends by Year[24)]

During Phases Ⅰ and Ⅱ, the total trading volume for emission permits was 198.0 Mt, the total payments were 4,734.0 billion won, and the average trading price was 23,914 won per ton. In terms of the yearly trading volume for emission permits between 2015 and the third quarter of 2021, it increased at an average annual rate of 103.0% from 5.7 Mt in 2015 to 12.0 Mt in 2016, 26.3 Mt in 2017, and 47.5 Mt in 2018. However, the trading volume for 2019 was 38.1 Mt, which was 19.6% lower than the previous year. In 2020, it was 44.0 Mt, which was 15.6% higher than the previous year.

In terms of the type of emission permit (KAU, KCU, and KOC) traded during Phases Ⅰ and Ⅱ, the total trading volume for KAUs was 167.8 Mt, which accounted for 84.8% of the total trading volume for emission permits, and that for KOCs was 26.7 Mt, which accounted for 13.5% of the total trading volume. There has been no record of the actual trading of KCUs since 2018. The total trading volume for KCUs was 3.4 Mt, which accounted for 1.7% of the total trading volume for emission permits.

From 2015 to 2020, the average price for the emission permits continuously increased at an average annual rate of 22.6%. However, the average trading price for emission permits fell to 18,187 won in 2021 due to the effects of COVID-19, which was 40.2% lower than the previous year.

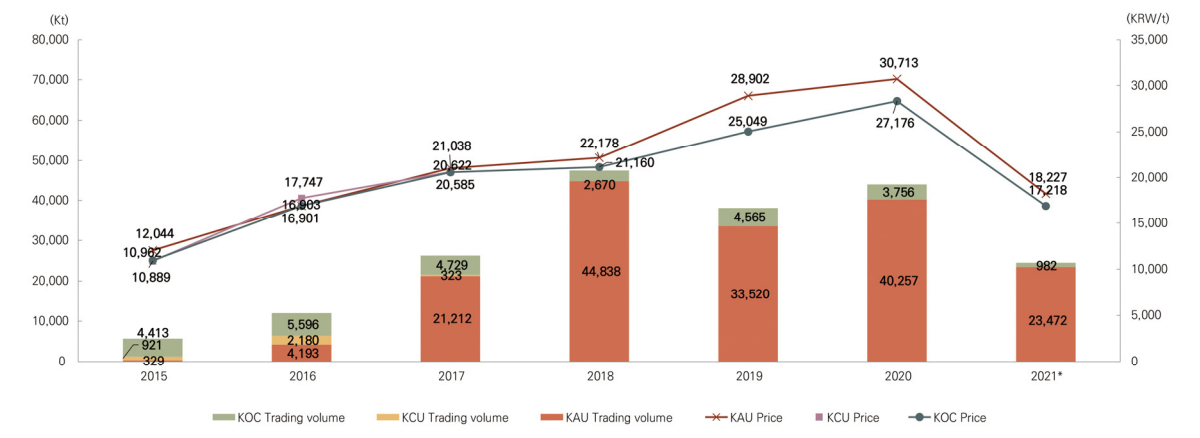
In terms of the type of emission permit, the average trading price for KAUs continued to rise at an average annual rate of 20.6% from 12,044 won in 2015 to 30,713 won in 2020. The trading price for

24) The amount of emission permits that must be surrendered is determined based on the amount of certified emissions for each compliance year (1 January–31 December), but emission permits can be traded from the date of the registration of emission permits allocated free-of-charge until the date of the surrender of those emission permits (e.g., KAU20s were traded between November 15, 2018 and August 9, 2021). The years indicated in Section 1.1 of Part III are actual years, not compliance years.

KAUs was 18,277 won in 2021, which was 40.7% lower than the previous year. The average trading price for KOCs continued to rise at an average annual rate of 19.9% from 10,962 won in 2015 to 27,176 won in 2020. The trading price for KOCs was 17,218 won in 2021, which was 36.6% lower than the previous year.

The continuous increase in the price and trading volume led to an increase in the total payments for emission permits between 2015 and 2020, with an average annual increase of 84.6%. The total payments for emission permits were 62.4 billion won in 2015, 204.1 billion won in 2016, 550.3 billion won in 2017, 1,050.9 billion won in 2018, 1,083.1 billion won in 2019, and 1,338.5 billion won in 2020. The total payments for emission permits until the last trading day for KAU20 in 2021 (August 9, 2021) were 444.8 billion won.

〈Figure Ⅲ-1〉 Trends in the Total trading volume and Price by Emission permits



* Trading records are until the last trading day for KAU20 in 2021 (August 9, 2021).

〈Table Ⅲ-1〉 Overall Trading Volume, Trading Price, and Payments for Emission Permits

Type			2015	2016	2017	2018	2019	2020	2021*
Trading Volume (kt)	Exch-ange	Real-Time	51	2,062	4,640	4,814	4,636	8,263	9,264
		Block	1,191	2,771	10,094	8,351	4,373	4,520	605
		Auction	-	274	-	4,665	7,950	8,171	302
	OTC		4,421	6,861	11,530	29,677	21,125	23,059	14,284
	Subtotal		5,663	11,969	26,264	47,507	38,084	44,013	24,455
Trading Price (won/t)	Exch-ange	Real-Time	12,208	17,953	21,315	22,271	29,414	28,785	16,192
		Block	11,140	17,728	21,064	22,127	28,254	29,802	15,209

Type			2015	2016	2017	2018	2019	2020	2021*
Payments (Million won)		Auction	-	16,221	-	22,500	29,238	30,385	16,477
	OTC		10,965	16,549	20,706	22,034	27,965	31,122	19,643
	Subtotal		11,013	17,056	20,951	22,120	28,440	30,411	18,187
	Exchange	Real-Time	624	37,025	98,906	107,210	136,373	237,843	149,998
		Block	13,268	49,131	212,621	184,793	123,568	134,701	9,197
		Auction	-	4,443	-	104,954	232,430	248,290	4,974
	OTC		48,480	113,547	238,741	653,925	590,758	717,635	280,581
	Subtotal		62,372	204,146	550,268	1,050,881	1,083,129	1,338,469	444,751

* Trading records are until the last trading day for KAU20 in 2021 (August 9, 2021).

⟨Table Ⅲ-2⟩ Trading Volume by Emission Permit

(Unit : Kt)

Type			2015	2016	2017	2018	2019	2020	2021*
KAU	Exchange	Real-Time	13	918	3,641	4,588	4,485	8,073	9,258
		Block	308	1,370	10,067	8,278	3,343	4,490	605
		Auction	-	274	-	4,665	7,950	8,171	302
	OTC		8	1,631	7,504	27,307	17,742	19,523	13,308
	Subtotal		329	4,193	21,212	44,838	33,520	40,257	23,472
KCU	Exchange	Real-Time	38	482	296	-	-	-	-
		Block	883	1,401	27	-	-	-	-
	OTC		-	296	-	-	-	-	-
	Subtotal		921	2,180	323	-	-	-	-
KOC	Exchange	Real-Time	-	662	703	226	151	190	6
		Block	-	-	-	73	1,030	30	-
	OTC		4,413	4,934	4,026	2,370	3,383	3,536	976
	Subtotal		4,413	5,596	4,729	2,670	4,565	3,756	982

* Trading records are until the last trading day for KAU20 in 2021 (August 9, 2021).

⟨Table Ⅲ-3⟩ Average Trading Price by Emission Permit

(Unit : won/t)

Type			2015	2016	2017	2018	2019	2020	2021*
KAU	Exchange	Real-Time	10,998	17,712	21,314	22,208	29,384	28,633	16,189
		Block	12,073	17,366	21,065	22,105	28,780	29,733	15,209

Type			2015	2016	2017	2018	2019	2020	2021*
		Auction	–	16,221	–	22,500	29,238	30,385	16,477
	OTC		12,700	16,169	20,867	22,139	28,653	31,935	19,822
	Subtotal		12,044	16,901	21,038	22,178	28,902	30,713	18,227
KCU	Exch-ange	Real-Time	12,637	18,173	20,605	–	–	–	–
		Block	10,815	18,082	20,813	–	–	–	–
	OTC		–	15,471	–	–	–	–	–
	Subtotal		10,889	17,747	20,622	–	–	–	–
KOC	Exch-ange	Real-Time	–	18,127	21,617	23,530	30,302	35,266	21,333
		Block	–	–	–	24,636	26,549	40,013	–
	OTC		10,962	16,739	20,405	20,826	24,358	26,633	17,193
	Subtotal		10,962	16,903	20,585	21,160	25,049	27,176	17,218

* Trading records are until the last trading day for KAU20 in 2021 (August 9, 2021).

〈Table Ⅲ-4〉 Payments by Emission Permit

(Unit : Million won)

Type			2015	2016	2017	2018	2019	2020	2021*
KAU	Exch-ange	Real-Time	147	16,262	77,601	101,883	131,791	231,141	149,870
		Block	3,718	23,791	212,062	182,989	96,221	133,501	9,197
		Auction	–	4,443	–	104,954	232,430	248,290	4,974
	OTC		102	26,376	156,594	604,567	508,348	623,463	263,797
	Subtotal		3,967	70,872	446,257	994,393	968,789	1,236,394	427,839
KCU	Exch-ange	Real-Time	477	8,766	6,107	–	–	–	–
		Block	9,549	25,340	559	–	–	–	–
	OTC		–	4,582	–	–	–	–	–
	Subtotal		10,026	38,688	6,667	–	–	–	–
KOC	Exch-ange	Real-Time	–	11,997	15,198	5,326	4,583	6,702	128
		Block	–	–	–	1,804	27,348	1,200	–
	OTC		48,379	82,589	82,146	49,358	82,409	94,173	16,784
	Subtotal		48,379	94,586	97,344	56,488	114,340	102,075	16,912

* Trading records are until the last trading day for KAU20 in 2021 (August 9, 2021).

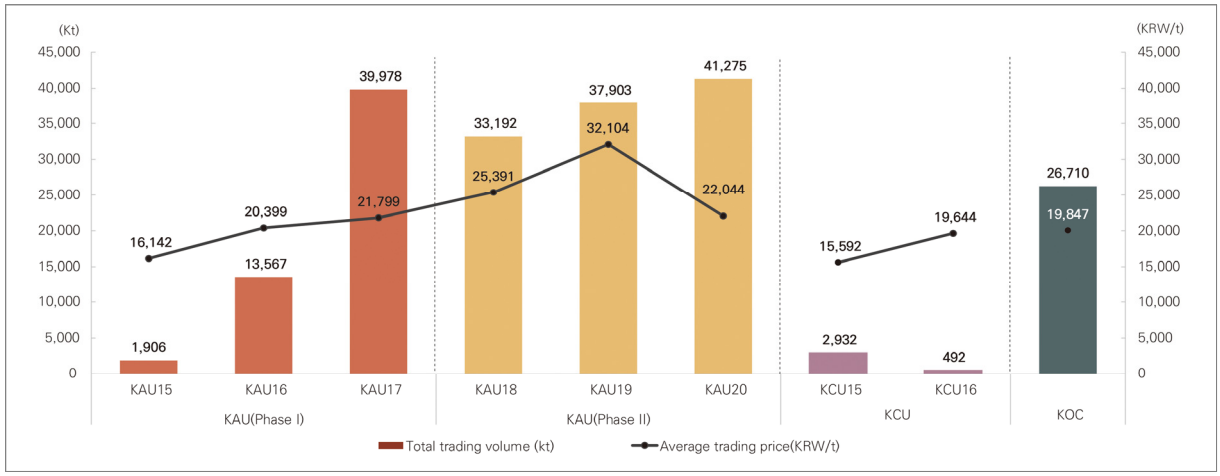
1.2. Trading Volume and Price Trends by Type of Emission Permit

In this section, the trading volume and price for each type of emission permit (KAU, KOC, and KCU) are analyzed. 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 and deadlines for surrender apply to each type of emission permit in each compliance year.[25)]

During Phases Ⅰ and Ⅱ, the trading volume for KAUs continued to increase for each compliance year. During Phase Ⅰ, the trading volume for KAU15 was 1.9 Mt, that for KAU16 was 13.6 Mt (an increase of 611.7%), and that for KAU17 was 40.0 Mt (an increase of 194.7%). During Phase Ⅱ, the trading volume for KAU18 was 33.2 Mt, which was 17.0% lower than trading volume for KAU17. The trading volume for KAU19 was 37.9 Mt, which was 14.2% higher than the previous compliance year. In addition, the trading volume for KAU20 was 41.3 Mt, which was 8.9% higher than the previous compliance year and the highest trading volume recorded for KAUs.

The trading volume for KCU15 was 2.9 Mt, which decreased to 0.5 Mt for KCU16. There have been no KCU transactions undertaken since the 2017 compliance year. Covered entities are able to convert KOCs into KCUs so that they can use KCUs to meet their obligation to surrender emission permits. However, due to the revision of the GHG reduction certification guidelines in 2021, KOCs are now tradable only for two years from the end of the year they are issued and should be converted into KCUs thereafter (see Section 1.2 of Part Ⅰ). There was no exchange trading of KOCs in the first and second quarters of 2021 but, after the revision of the guidelines, the trading volume and number of trades of KOCs increased.

〈Figure Ⅲ-2〉 Total Trading Volume and Average Trading Price by Emission Permit



25) Each type of emission permit (e.g., the number "20" in "KAU20" refers to the 2020 compliance year) can be traded from the date of the registration of emission permits allocated free-of-charge until the date of the surrender of those emission permits (e.g., KAU20s were traded between November 15, 2018 and August 9, 2021).

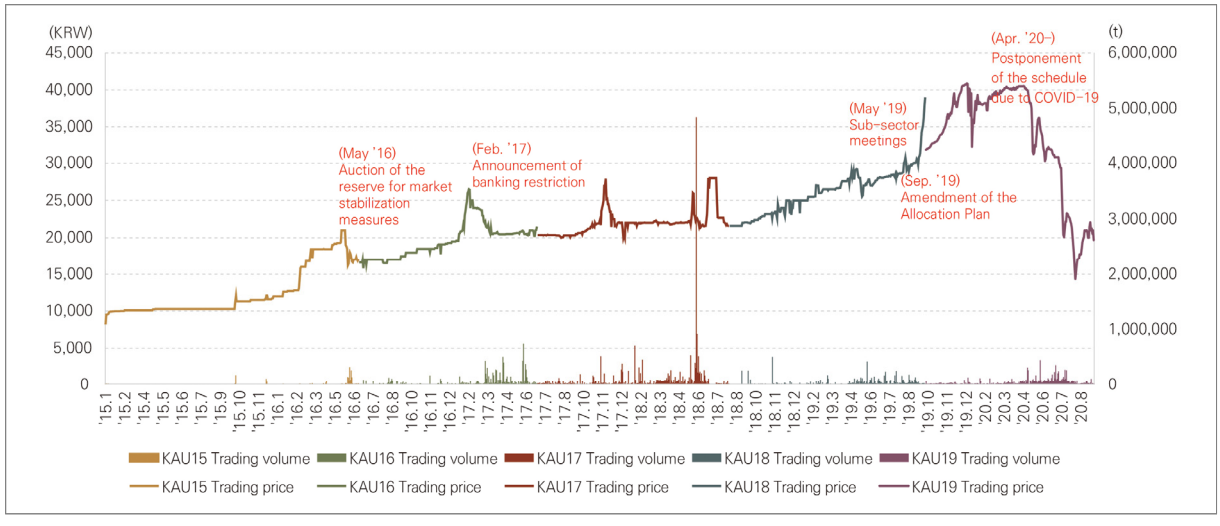
1.3. Factors Contributing to Changes in the Trading Records

In the K-ETS, the trading price and volume are determined by supply and demand. In particular, the operational procedures and schedule for the K-ETS tend to serve as an incentive for the trading of emission permits.

The price for emission permits, which was 8,640 won on the first trading day of Phase Ⅰ, fluctuated and rose to reach 21,600 won on the last trading day (August 9, 2018), representing a 2.5-fold increase compared to the price on the first trading day. The price declined due to the auction of the reserve for market stabilization measures (May 2016) and the announcement of the policy restricting the banking of emission permits (Febuary 2017) but stabilized at the time when the covered entities surrendered their emission permits.

During Phase Ⅱ, only a small amount of KAU18 was traded until October 2018 at a price of 21,000-25,000 won, which was similar to the price for emission permits during Phase Ⅰ. The price for emission permits rose as the trading volume increased thereafter, but the price fell sharply as the trading volume decreased after sub-sector meetings were held (13-15 May 2019) and the Allocation Plan was amended (September 2019) to reflect the amended Roadmap specifying the revised national GHG reduction targets. Thereafter, the price for emission permits rose again and stabilized at the time when the covered entities surrendered their emission permits (September 30, 2019). The price for KAU19 sharply decreased due to the effects of COVID-19.

〈Figure Ⅲ-3〉 Trading Records for KAU15-KAU19



2 Trading Records for the 2020 Compliance Year of Phase Ⅱ

In this section, trading records for KAU20 and KOCs (KOC20-22 and KOC21-23) traded on the exchange market and the over-the-counter market during the trading period for KAU20 (November 15, 2018-August 9, 2021) are analyzed.

2.1. Detailed Analysis of the Trading Volume

The total trading volume for the trading period in the 2020 compliance year was 41.3 Mt for KAU20 and 10.4 Mt for KOCs, accounting for 79.9% and 20.1%, respectively. The total trading volume for KAU20 was 4.2 times higher than that for KOCs. The trading volume for KAU20 continued to increase from the first to fourth quarters in 2020. It decreased in the first quarter of 2021 but increased again to reach a quarterly record of 17.4 Mt in the second quarter in 2021 immediately before the last trading quarter, accounting for 42.2% of the total trading volume for KAU20.

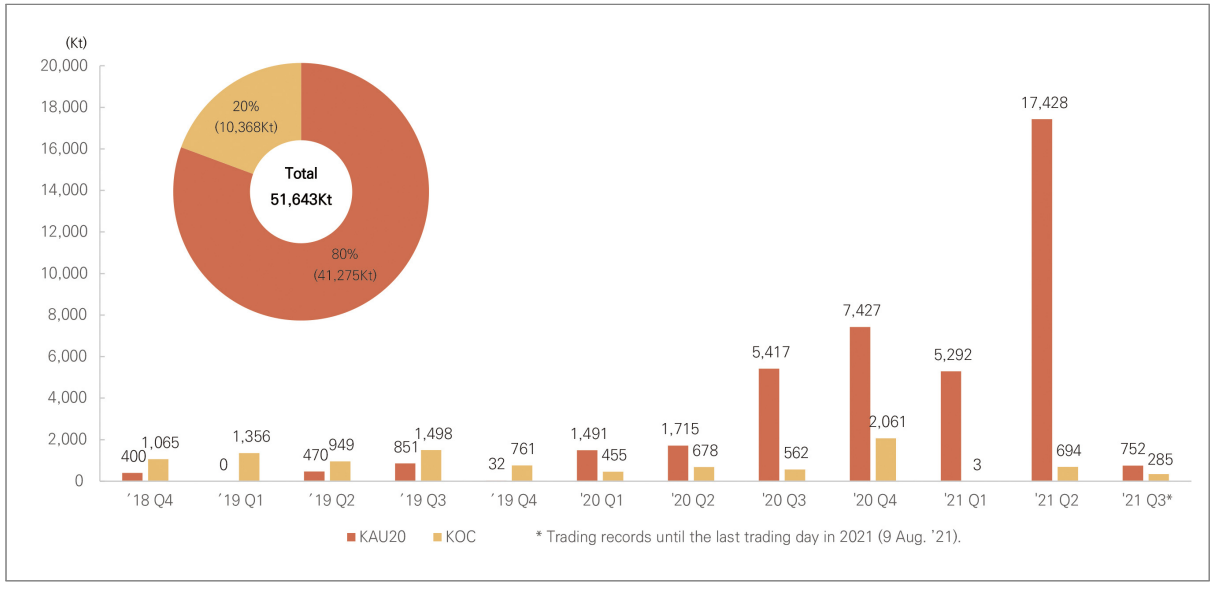
From the fourth quarter of 2018 to the first quarter of 2020, the trading was concentrated on KAU19, thus the trading of KAU20 was relatively low. The trading of KAU20 continued steadily at 1 Mt per month since June 2020 and began to increase after reaching 6.1 Mt in April 2021, which was 223.0% higher than the previous month. The trading volume for KAU20 was 4.2 Mt in May, and it reached the highest record of 7.1 Mt in June, two months before the last trading day. The trading trend for KAUs in the 2018 and 2019 compliance years was similar; during these years, the trading volume for KAUs reached its highest level 1-3 months before the time when the emission permits were to be surrendered. This trend indicates that the operation and schedule of the K-ETS affect the trading volume.

The trading volume for KOCs reached 2.3 Mt in the first half of 2019[26] but continued to decrease to reach 1.1 Mt in the first half of 2020 (38.4% lower than the previous year) and 0.7 Mt in the first half of 2021 (57.1% lower than the previous year). As discussed earlier, the trading volume for KOCs did not show a tendency to sharply increase during a specific period of time before the revision of the guidelines because there was no restriction on their trading period. However, since June 2021, the

26) Only the amounts of emission permits traded during the first half (i.e., first and second quarters) of the mentioned compliance years were compared for analysis because directly comparing the amounts of emission permits traded during different years was not possible given that the last trading days differ every year.

trading period for KOCs has been fixed and KOCs were renamed so that their name would indicate the limited trading period (e.g., KOC20-22 and KOC21-23). Accordingly, the trading volume for KOCs began to increase.

〈Figure Ⅲ-4〉 Quarterly Trading Volume by Emission Permit (KAU20, KOC)



Of the total trading volume for KAU20, 17.2 Mt were traded on the exchange market and 24.1 Mt were traded on the over-the-counter market, accounting for 41.7% and 58.3%, respectively. On the exchange market, emission permits are traded via real-time trading, block trading, or auctions.[27] The amount of KAU20 traded via real-time trading was 11.7 Mt, which accounted for the highest proportion of the trading volume for KAU20 (28.4%). The trading volume of KAU20 was 3.2 Mt (7.8%) via auction and 2.3 Mt (5.5%) via block trading.

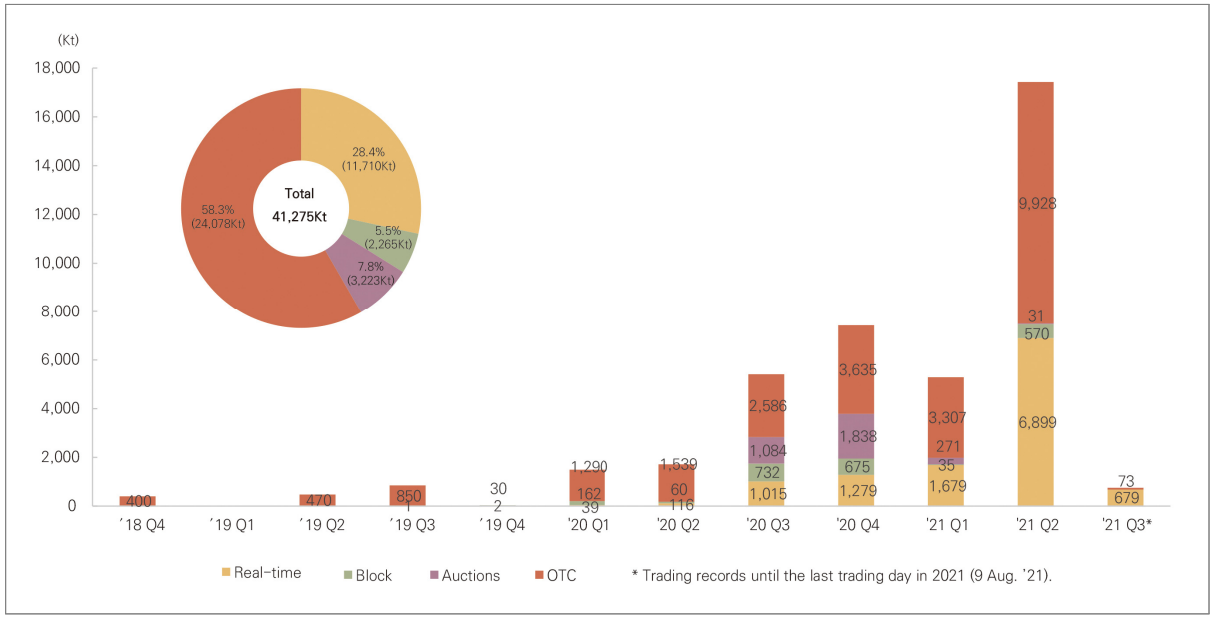
Between August 2020 and June 2021, a total of seven auctions were held for the allocation of KAU20. The total volume of bids made was 7.1 Mt, and the total volume of valid bids was 3.2 Mt, representing 45.6% of the total volume of bids made. Auctions were temporarily suspended from February to May 2021 for the first time since their introduction in 2019 in consideration of the

27) **(Real-Time Trading)** In the emissions trading market, emission permits can be traded through individual competitive, real-time trading, which can be divided into real-time trading with a single price and real-time trading with a multiple number of prices. In real-time trading, participants submit selling or buying orders via an online platform on which the orders will be retained for a certain period of time, and the system matches the selling and buying orders at a price (matching price) that best suits both orders. **(Block Trading)** In the emissions trading market, emission permits can be traded through block trading, under which the parties to the transaction negotiate in advance the type, quantity, and price of the emission permits to be traded between them and submit the selling and buying orders so that emission permits are traded consistently with the conditions the parties have agreed on.

decrease in the price and the surplus amount of emission permits. The auction for KAU20 resumed on 25 June and ended with 30,900 t of valid bids, which was the lowest recorded volume of valid bids.

Over-the-counter trading of KAU20 continued to increase from 0.4 Mt in the fourth quarter of 2018 to the second quarter of 2021, excluding the first and fourth quarters of 2019. In the second quarter of 2021, 9.9 Mt of KAUs were traded, which was the highest quarterly trading volume. A similar trend was observed in the exchange trading where the trading volume sharply increased near the time when the emission permits were to be surrendered.

〈Figure Ⅲ-5〉 Trends in the Quarterly Trading Volume by Trading Market (KAU20)

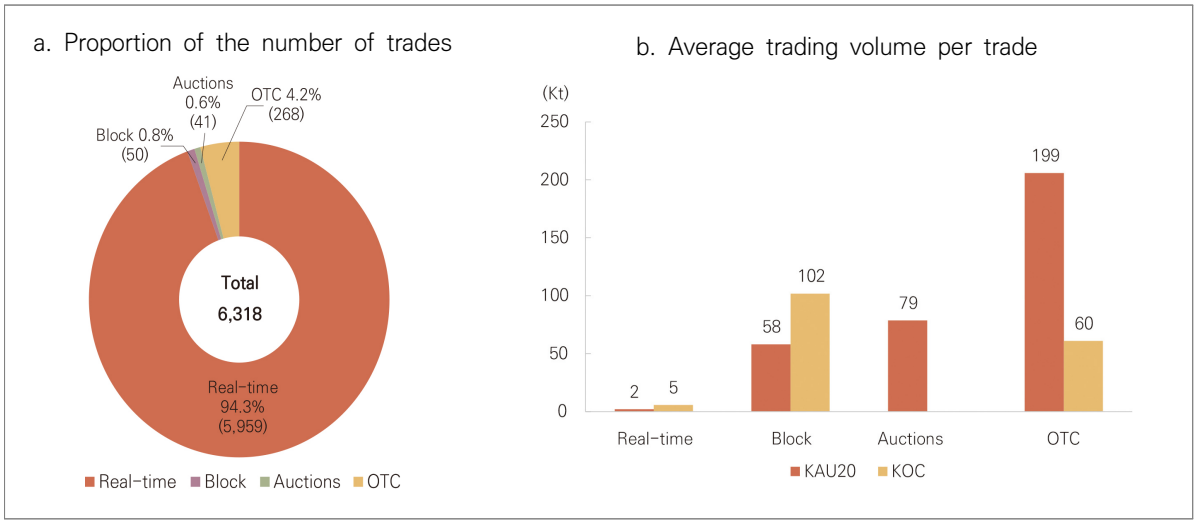


Of the total number of emission permit trades (6,318), 6,050 trades (95.8%) were made on the exchange market and 268 trades (4.2%) were made on the over-the-counter market. Due to the nature of exchange trading involving transactions among a large number of unidentified entities including market makers, the number of exchange trades exceeded the number of over-the-counter trades that involve one-on-one trades between specific entities.

The average trading volume for KAU20 per trade was 206 kt in over-the-counter trading, 79 kt in auctions, 58 kt in exchange block trading, and 2 kt in exchange real-time trading. This shows that many small trades occurred on the exchange market, while fewer, larger trades were made on the over-the-counter market.

The average trading volume for KOCs per trade was 102 kt in exchange block trading, 65 kt in over-the-counter trading, and 6 kt in exchange real-time trading. This is different from the results for the previous year, where the average trading volume for KOCs per trade in over-the-counter trading was higher than that in exchange block trading.

〈Figure Ⅲ-6〉 Proportion of the Number of Trades by Trading Type and Average Trading Volume per Trade (KAU20, KOC)



2.2. Detailed Analysis of Trading Prices

During the exchange trading period for KAU20 (September 24, 2019-August 9, 2021), the trading price rose from 31,300 won (closing price) on the first trading day to 42,500 won (closing price) in early April 2020 but began to decline sharply thereafter due to the effects of COVID-19. The average price for KAU20 was 41,392 won in April 2020, but it had decreased sharply by 49.3% to 20,995 won by August 2020.

KAU20 was continuously traded from the third quarter of 2020, so the trading price for KAU20 ranged between 20,000 won and 25,000 won until early December 2020. The average price for KAU20 rose sharply by 35% from 23,003 won on 8 December to 30,798 won on 18 December (10 days) and then fell sharply by 52% to approximately 15,000 won in mid-January 2021. This short-term fluctuation appears to have been caused by the increase in the trading volume of the covered entities that intended to sell their surplus emission permits.

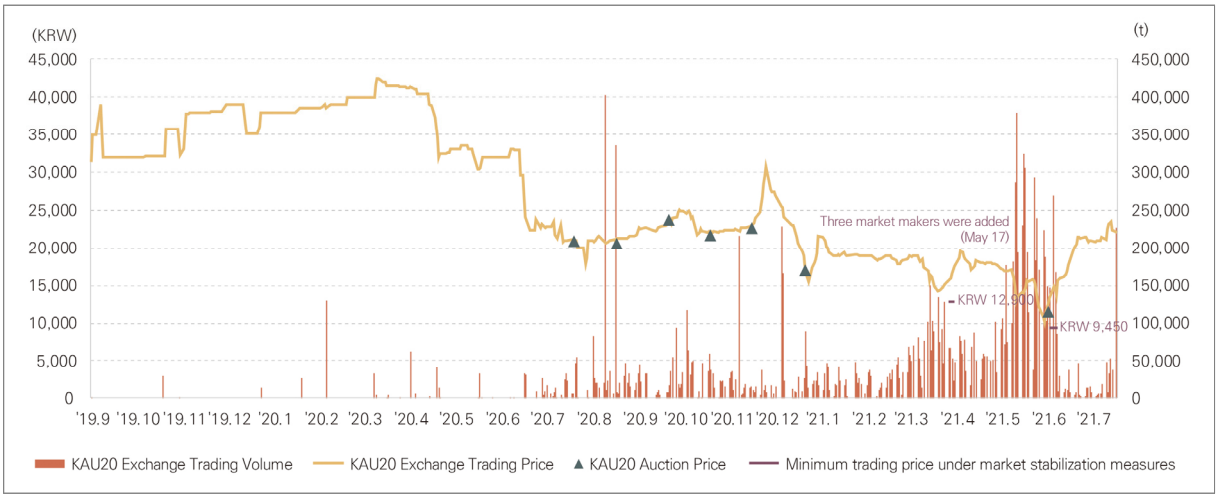
The exchange trading price for KAU20 ranged between 15,000 won and 20,000 won after

mid-January 2021 but fell sharply in April and June, resulting in the implementation of a market stabilization measure. In April 2021, based on the relevant guidelines, the government set the minimum trading price for KAU20 at 12,900 won per ton to stabilize the emissions trading market. The lowest trading price for KAU20 between 12-16 April, which was 14,300 won, was used as the reference price for determining the termination of the market stabilization measure. The application of market stabilization was lifted on 26 April because the closing price for KAU20 remained higher than the reference price for five consecutive days after the date of the initiation of the measure.

In May 2021, three additional institutions were designated as new market makers, and the exchange trading volume for emission permits sharply increased as the deadline to surrender emission permits approached. In June, however, the price for emission permits fell sharply as covered entities continued to sell surplus emission permits generated due to a decrease in production caused by the effects of COVID-19. As a second market stabilization measure, the government set the minimum trading price for KAU20 at 9,450 won per ton on 25 June. The application of the measure was lifted on 2 July because the trading price for KAU20 remained higher than the newly established reference price for five consecutive days after the date of the initiation of the measure.

The average auction price for KAU20 per ton continued to increase after the auctions began in August 2020 from 20,900 won in August to 20,550 won in September, and then to 23,700 won in October. It fell to 21,650 won in November but rebounded to 22,600 won in December. In January 2021, the average auction price for KAU20 decreased by 33% compared to the previous month to 17,050 won, which was similar to the exchange trading price for KAU20. Auctions for emission permits were temporarily suspended from February to May 2021 in consideration of the price for emission permits and the amount of emission permits available in the market. At the last auction held in June, the average auction price for emission permits was 11,450 won for 30,900 t of valid bids, which was the lowest recorded price for the lowest recorded volume of valid bids since the introduction of auctions.

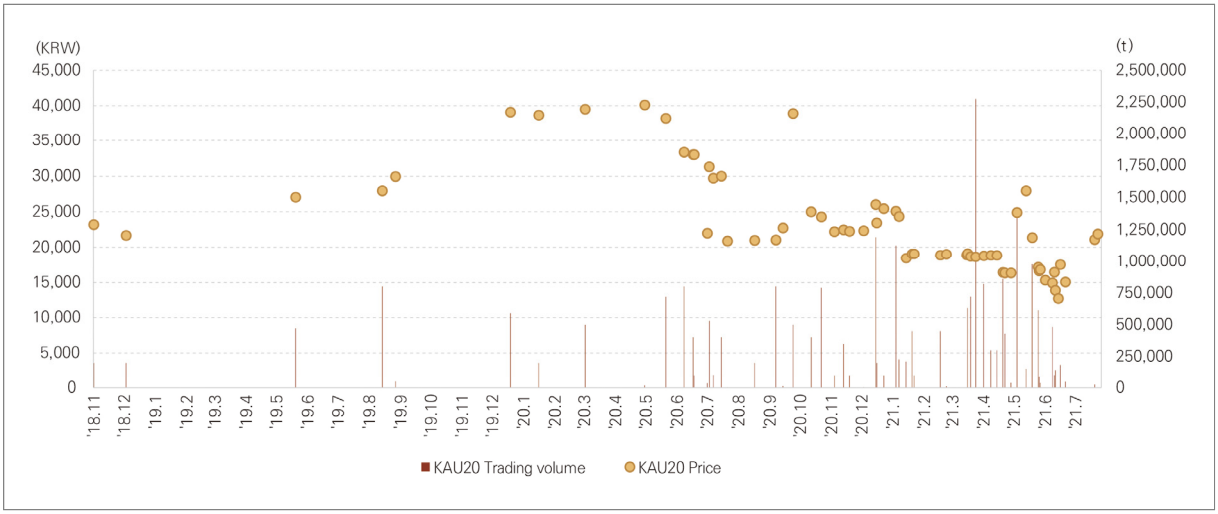
〈Figure Ⅲ-7〉 Trends in the Trading Volume and Price* for KAU20 in the Exchange Market



* The weighted average on each trading day. In the absence of trading, the KRX closing price on the trading day was applied.

During the over-the-counter trading period for KAU20 (November 15, 2018-August 6, 2021), the trading price rose from 23,200 won on the first trading day to a record high of 40,100 won in May 2020. Similar to the trend in the exchange trading price, the over-the-counter trading price for KAU20 continued to decline thereafter. KAU20 was sold at 38,900 won for one over-the-counter transaction conducted in October 2020, which was considerably higher than their exchange trading price. Excluding this transaction, the over-the-counter trading price for KAU20 ranged between 15,000 won and 25,000 won, showing a similar pattern to their exchange trading price. The over-the-counter trading price for KAU20 reached its lowest point in June 2021 (12,700 won) and continued to increase thereafter to reach 21,900 won on the last trading day.

〈Figure Ⅲ-8〉 Trends in the Trading Volume and Price for KAU20 in the Over-the-Counter Market

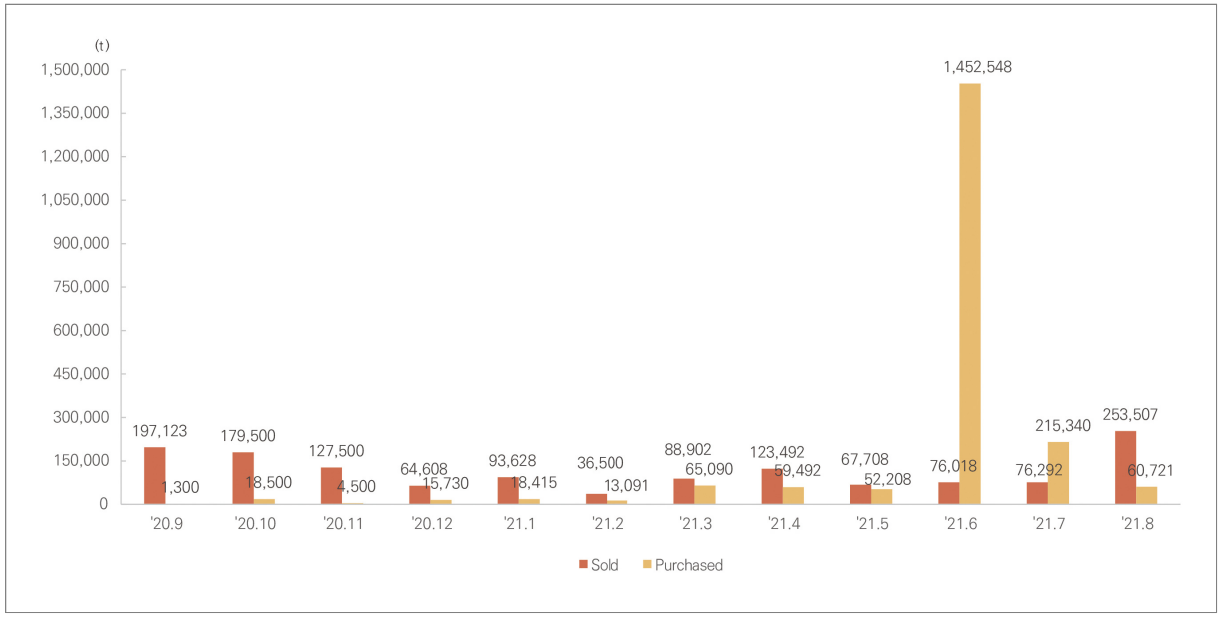


2.3. Analysis of the Trading Records for Market Makers

During the exchange trading period for KAU20, the amount of KAU20 purchased by market makers (2.0 Mt) exceeded the amount of KAU20 sold by them (1.4 Mt) by approximately 42.8%. The proportion of market-maker KAU20 trades from the total KAU20 trading volume[28] was 3.7% for selling and 5.2% for purchasing.

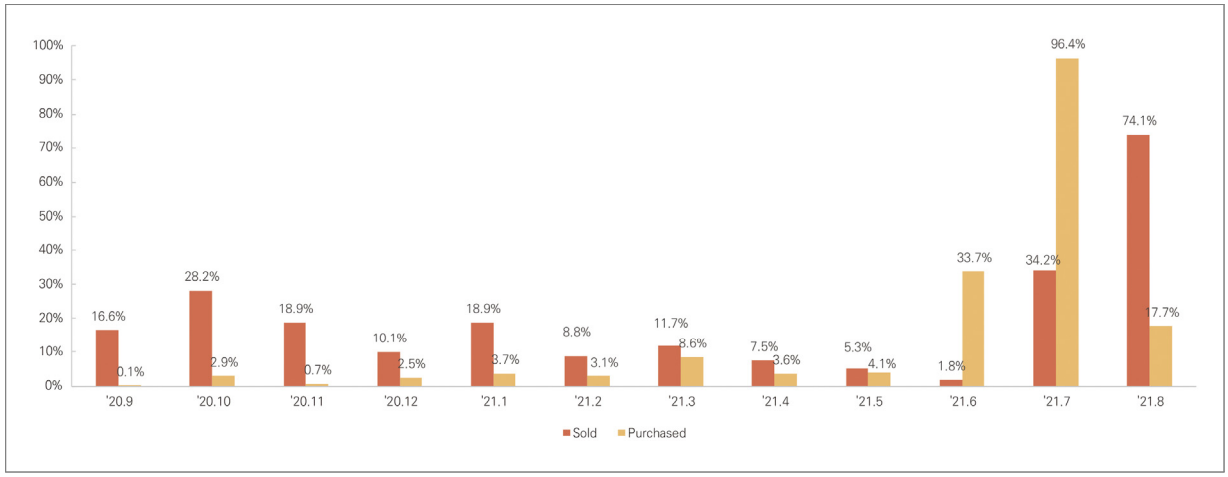
In terms of the monthly trading volume, the amount sold by market makers exceeded the amount purchased in all months except for June and July 2021. In June 2021, market maker trading increased greatly to 1.5 Mt, which was 1,175% higher than the previous month (0.1 Mt), because the number of market makers increased and the time to surrender emission permits approached. In June, the amount of emission permits sold by market makers was 76,000 t, representing only 1.8% of the total trading volume, while the amount purchased by market makers was 1.5 Mt, representing 33.7% of the total trading volume. This suggests that most of the transactions were undertaken by covered entities selling their surplus emission permits to the market as the deadline to surrender their emission permits was imminent. In addition, the proportion of market-maker trading was very high in July and August 2021. In July, market makers participated in all of the KAU20 transactions on the exchange market by either selling or purchasing emission permits.[29]

〈Figure Ⅲ-9〉 Trends in the Monthly Volume of Market-Maker Trading for KAU20



28) Based on the trading volume registered in the Emissions Trading Registry System (ETRS).
29) This includes inter-market maker transactions.

〈Figure Ⅲ-10〉 Trends in the Proportion of Market-Maker Trading from the Monthly Total Trading Volume for KAU20



Phase Ⅱ | 2018-2020

2020 Korean Emissions Trading System Report

PART Ⅳ

Stakeholder Survey

1. Overview of the Stakeholder Survey
2. Views on and Assessment of the K-ETS
3. K-ETS Response and Prospects for Phase Ⅲ

1 Overview of the Stakeholder Survey

A survey was conducted with covered entities participating in the K-ETS regarding their views of the K-ETS, the patterns of emissions trading, the prospects for the price of emission permits, and the GHG emission reduction performance.

It was conducted for 25 days from September 16 to October10, 2021 by selecting a total of 636 covered entities from all six sectors as subjects of the survey, with a response rate of 40.9% (260 responses excluding duplicates). Except for the waste sector, the distribution of the responding covered entities within the individual sectors was relatively similar to the distribution of the sample covered entities selected for the survey within the individual sectors.

2 Views on and Assessment of the K-ETS

The impacts of the K-ETS on the business operations of the covered entities were analyzed. The survey results showed that, compared to the last two reports (68.0% in the 2019 survey, and 63.9% in the 2018 survey responded positively),[30] the interest in the K-ETS within the responding entities was significantly higher (positive: 84.2%, negative: 4.2%). In particular, the respondents reported that the internal interest in environmental management such as ESG (Environmental, Social and Governance) management and RE (Renewable Energy) 100 had increased significantly (positive: 70.0%, negative: 8.5%). It was found that the growing interest in the K-ETS and environmental management led to internal innovation, such as new product development and process improvement. The number of entities that responded that the K-ETS had served as an opportunity for internal innovation (45.7%) was greater than the number of entities that claimed the opposite (17.3%); positive responses continued to increase compared to the previous surveys (positive 30.3%, negative 41.6% in 2019, and positive 26.0%, negative 39.2% in 2018).

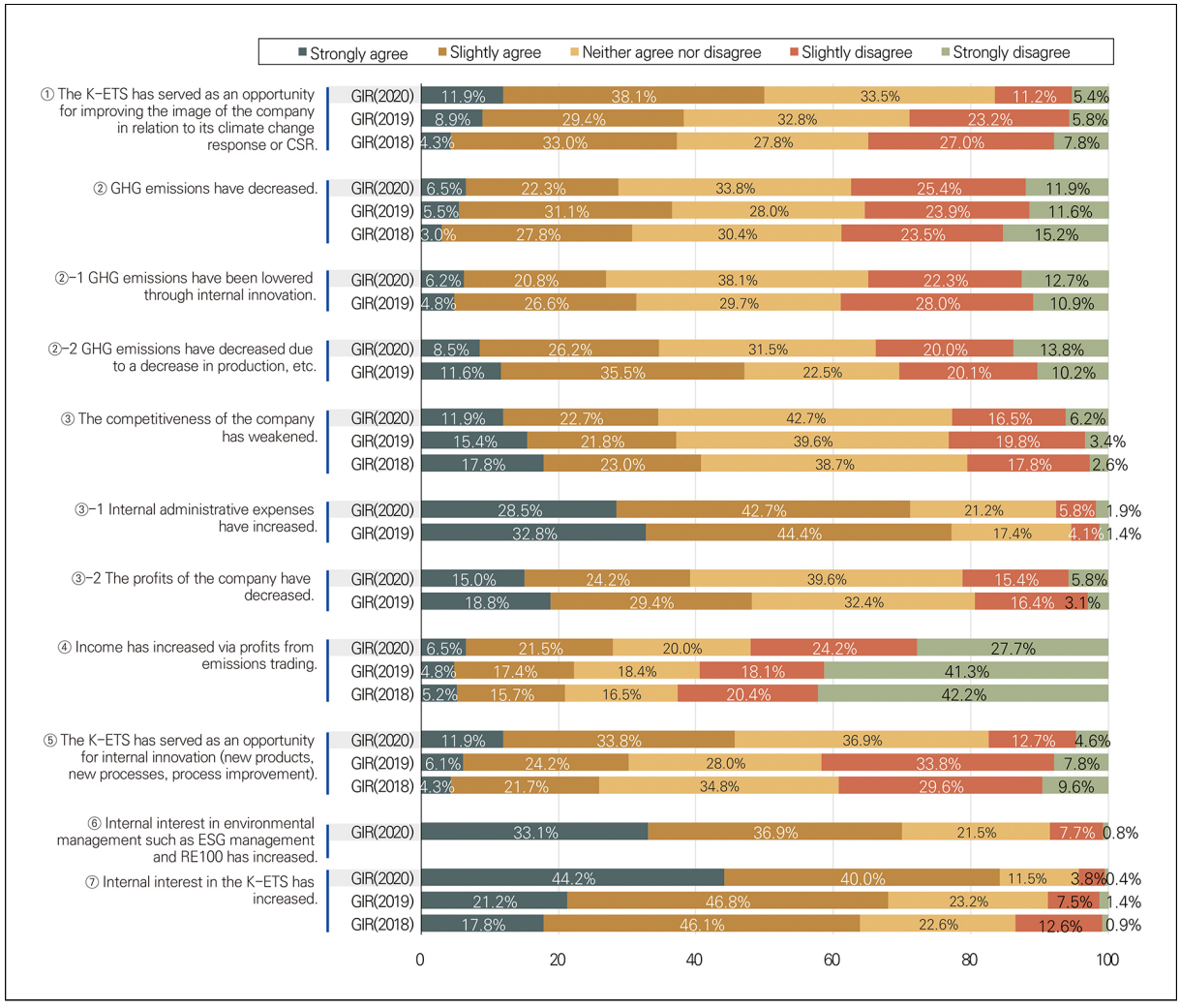
However, the number of entities who reported that the amount of GHG emissions had decreased (28.8%) was fewer than those who claimed otherwise (37.3%), and the proportion of entities saying

30) The 2018 and 2019 GIR survey results.

that internal innovation had resulted in a reduction in GHG emissions (27.0%) was low. The results showed that internal innovation that resulted from the growing interest in climate change and environmental management has not yet led to an emissions reduction.

According to survey results, the number of entities that responded that the K-ETS had weakened the competitiveness of the company (positive: 34.6%, negative: 22.7%), and that their profits had fallen (positive 39.2%, negative: 21.2%) were high, although the proportion of negative responses decreased compared to the previous surveys. In addition, the response that internal administrative expenses increased due to the participation in the K-ETS was very high (71.2%). While 28.0% of the responding entities stated that they had obtained additional profits from emission permit trading, 51.9% of the responding entities claimed the opposite.

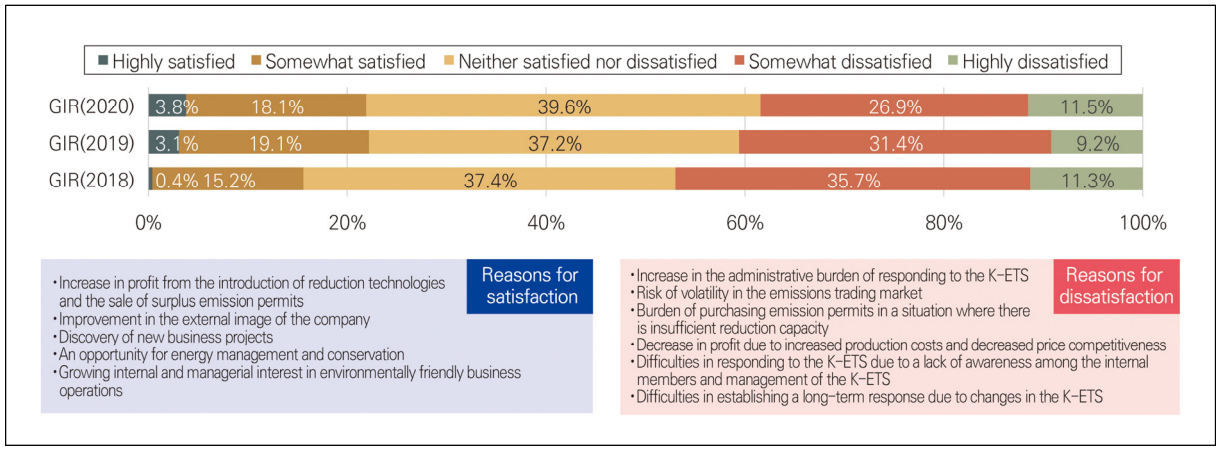
〈Figure Ⅳ-1〉 Impact of the K-ETS on the Business Operations of the Covered Entities



The survey results showed that the responding entities' views on their business performance after participating in the K-ETS had a negative impact on the overall satisfaction with the impact of the K-ETS on their business operations. More responding entities were dissatisfied (38.4%, 100 responses) than satisfied[31] (21.9%, 57 responses) with the impact of the K-ETS on their overall business operations. The proportion of dissatisfied entities was higher also in the previous surveys (satisfied 22.2%, dissatisfied 40.6% in 2019, and satisfied 15.6%, dissatisfied 47.0% in 2018); however, the difference between the number of satisfied and dissatisfied entities has decreased.

The reasons for dissatisfaction included the increase in the administrative burden of responding to the K-ETS, the risk of volatility in the emissions trading market, the burden of purchasing emission permits in a situation where there is insufficient reduction capacity, and a decrease in profit due to increased production costs and decreased price competitiveness. On the other hand, the reasons for satisfaction included the increase in profit from the introduction of reduction technologies and the sale of surplus emission permits, the improvement in the external image of the company, the discovery of new business projects, and greater opportunities for energy management and conservation.

〈Figure Ⅳ-2〉 Views on the Impact of the K-ETS on Overall Business Operations

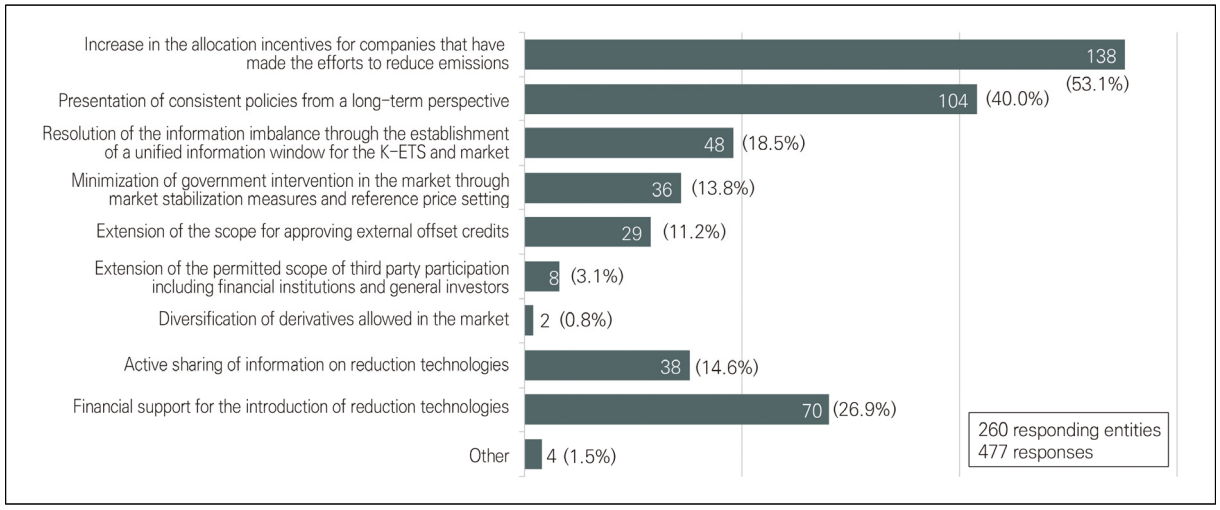


With regard to the required improvements for the K-ETS, the responding entities proposed an increase in preferential treatment for companies that have made the effort to reduce their GHG emissions (53.1%, 138 responses), the presentation of consistent policies from a long-term perspective (40.0%, 104 responses), the provision of financial support for the introduction of

31) In the survey, "Satisfied" included "Highly satisfied" and "Somewhat satisfied," and "Dissatisfied" included "Somewhat dissatisfied" and "Highly dissatisfied."

reduction technologies (26.9%, 70 responses), and the resolution of the information imbalance by establishing a unified information window for the K-ETS and market (18.5%, 48 responses). The results suggest that the entities believed that it was necessary to expand the institutional base to support GHG reduction, maintain policy consistency, and improve access to relevant information.

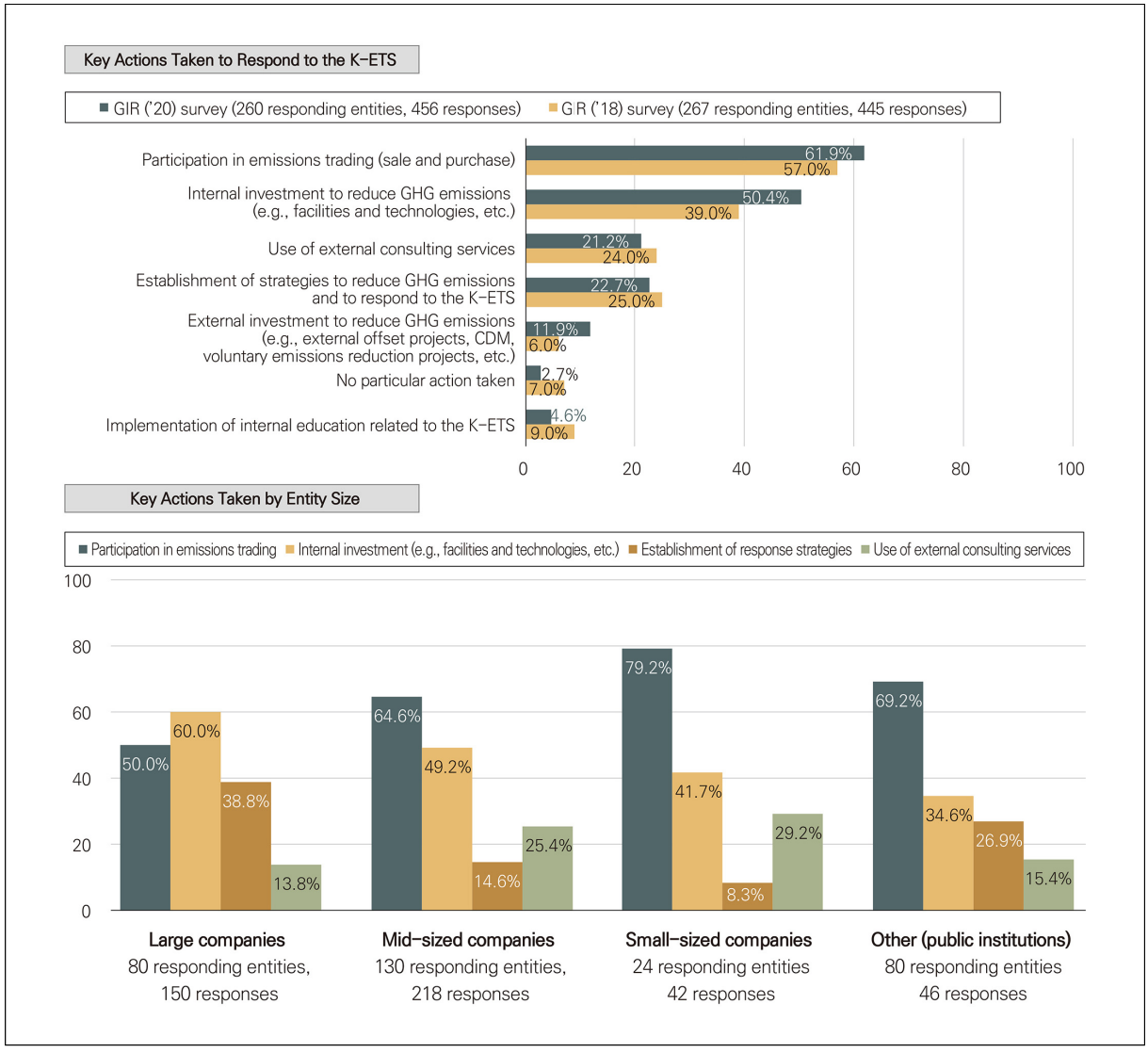
〈Figure Ⅳ-3〉 Necessary Improvements for the K-ETS (up to two responses allowed)



1.2. Response to the K-ETS during Phase Ⅱ

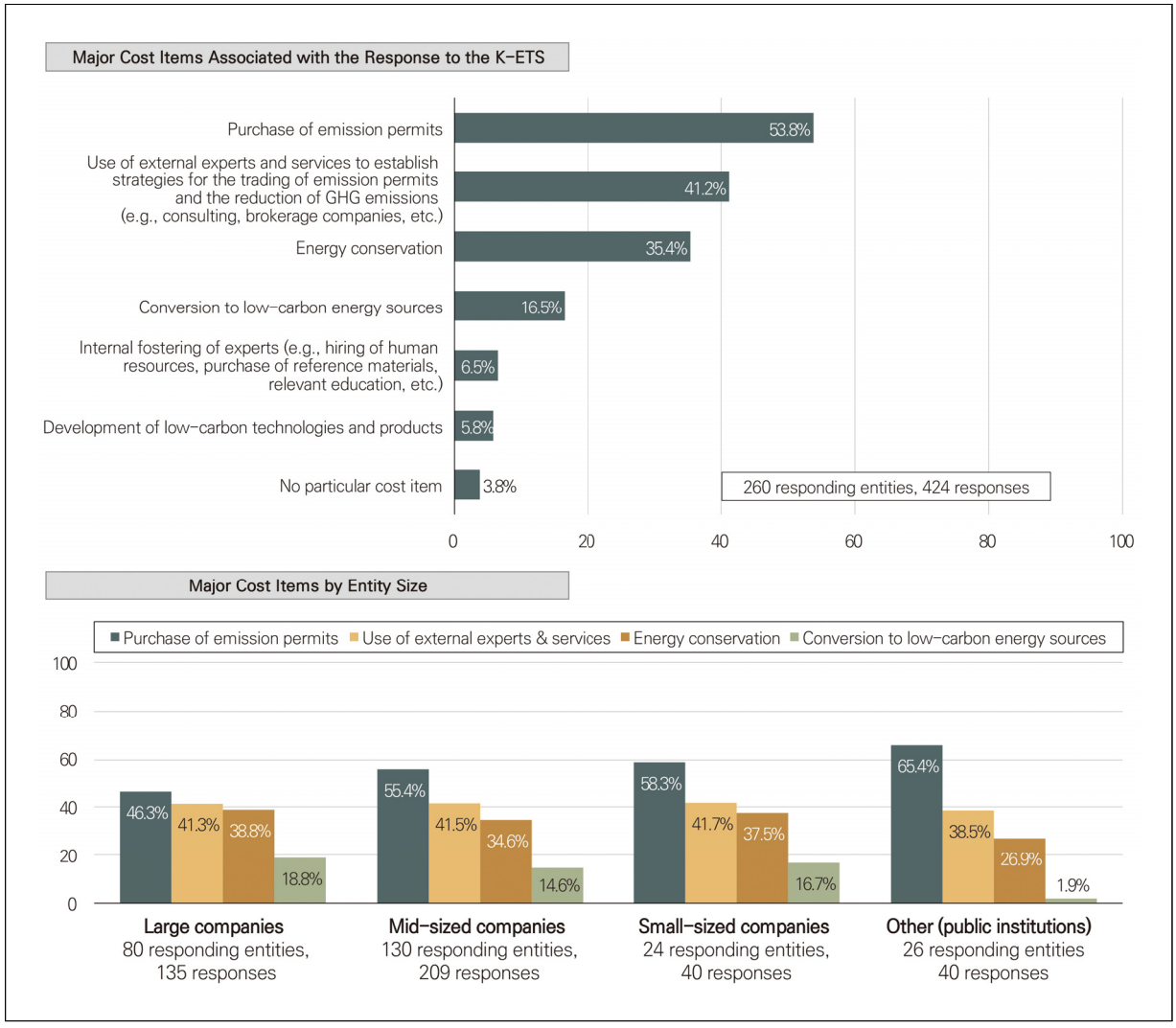
The key actions that were actually taken by the entities in response to the K-ETS were participation in emissions trading (61.9%, 161 responses), internal investment in facilities and technologies for reducing GHG emissions (50.4%, 131 responses), the establishment of strategies to reduce GHG emissions and to respond to the K-ETS (22.7%, 59 responses), and the use of external consulting services (21.2%). These results were the same as for the results of the survey conducted after the completion of Phase Ⅰ. In terms of entity size, actions taken by large companies and actions taken by entities of other sizes were different in that, while the proportion of large companies reporting to have utilized internal investment (60.0%, 48 responses) was larger than those reporting to have utilized emissions trading (50.0%, 40 responses), the proportion of entities of other sizes reporting to have utilized emissions trading (mid-sized companies: 64.8%, small-sized companies: 79.2%, other entities: 69.2%) was larger than those reporting to have utilized internal investment (mid-sized companies: 49.2%, small-sized companies: 41.7%, other entities: 34.6%).

〈Figure Ⅳ-4〉 Key Actions Taken to Respond to the K-ETS (up to two responses allowed)



The survey results showed that the main costs associated with the response to the K-ETS were the purchase of emission permits (53.8%, 140 responses), the use of external experts and services to establish strategies for the trading of emission permits and the reduction of GHG emissions (41.2%, 107 responses), energy conservation (35.4%, 92 responses), and conversion to low-carbon energy sources (16.5%, 43 responses). A comparison of the cost items by entity size revealed that there was no significant difference between entities of different sizes.

〈Figure Ⅳ-5〉 Major Cost Items Associated with the Response to the K-ETS (up to two responses allowed)

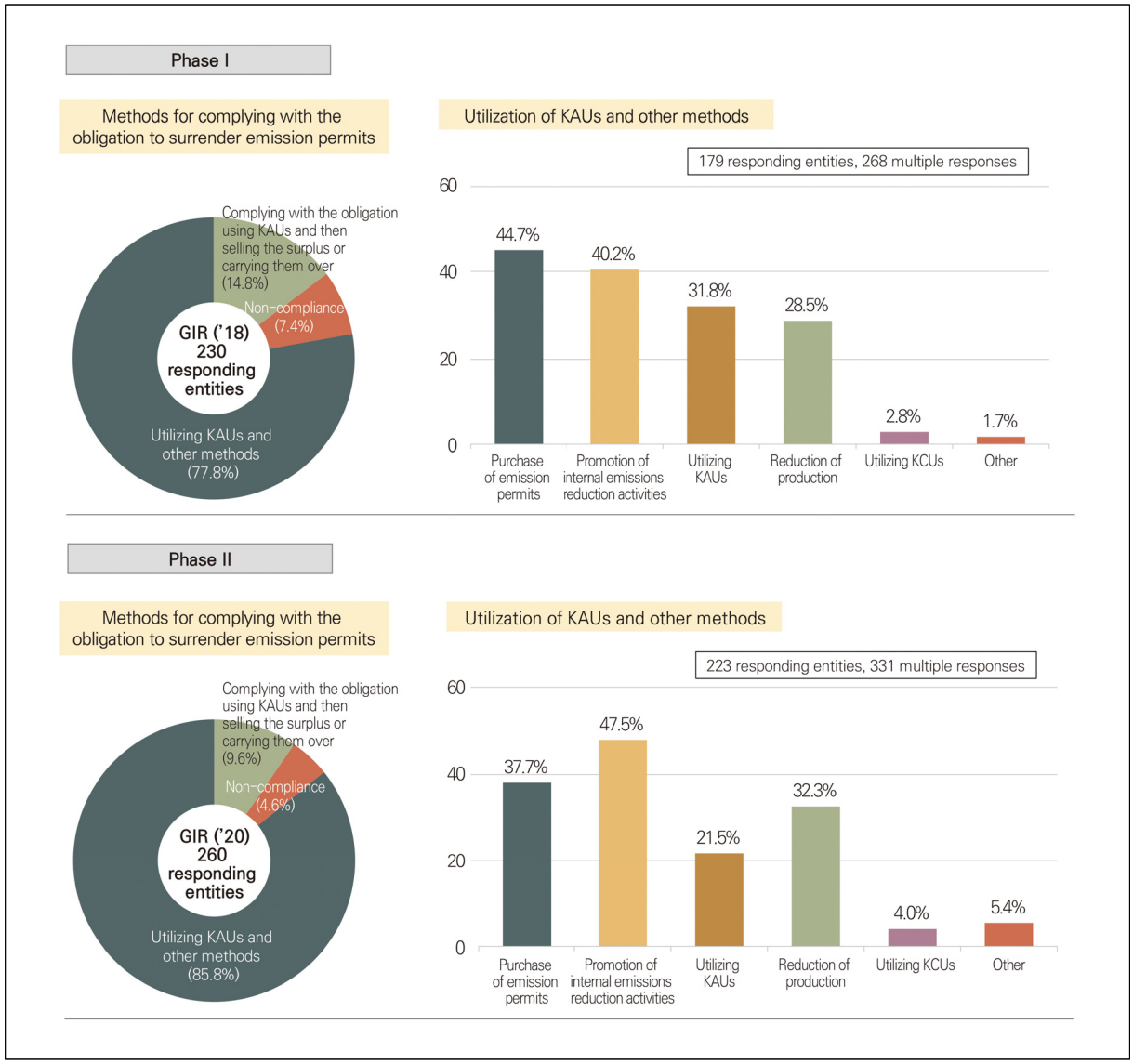


Responding entities met their obligation to surrender emission permits using KAUs and other methods. Other methods included the promotion of internal emissions reduction activities (47.5%, 106 responses), the purchase of emission permits (37.7%, 84 responses), and a reduction in production (32.3%, 72 responses).

With regard to the methods for complying with the obligation to surrender emission permits during each phase, the proportion of entities who reported that they were able to meet the obligation using KAUs only decreased from 14.8% (34 responses) in Phase Ⅰ to 9.6% (25 responses) in Phase Ⅱ. The most common methods employed by the entities that used KAUs and other methods included the purchase of emission permits (44.7%, 80 responses), the promotion of internal emissions reduction

activities (40.2%, 72 responses), and the utilization of KAUs (31.8%, 57 responses) in Phase Ⅰ, and the promotion of internal emissions reduction activities (47.5%, 106 responses), the purchase of emission permits (37.7%, 84 responses), and a reduction in production (32.3%, 72 responses) in Phase Ⅱ.

〈Figure Ⅳ-6〉 Methods for Meeting Emissions Allowances

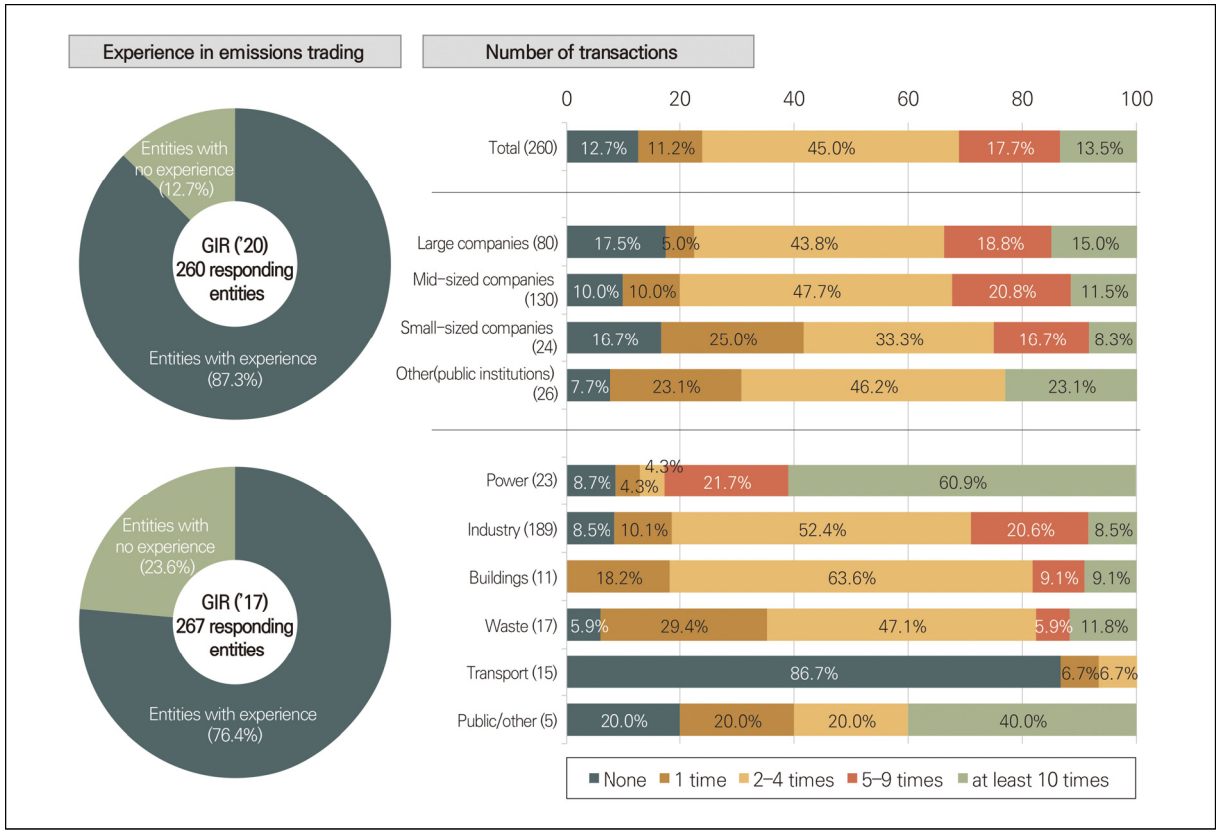


As shown above, while the trading of emission permits was reportedly the most commonly used method in response to the K-ETS to comply with their obligation to surrender emission permits and the most cost-consuming action taken in response to the K-ETS, in reality, the number of entities that had engaged in emissions trading 2-4 times accounted for the highest proportion of responses

(45.0%, 117 entities). In addition, 29 entities (11.2%) had engaged in emissions trading once, 46 entities (17.7%) 5–9 times, and 35 entities (13.5%) at least 10 times; 33 entities (12.7%) reported that they had never engaged in emissions trading.

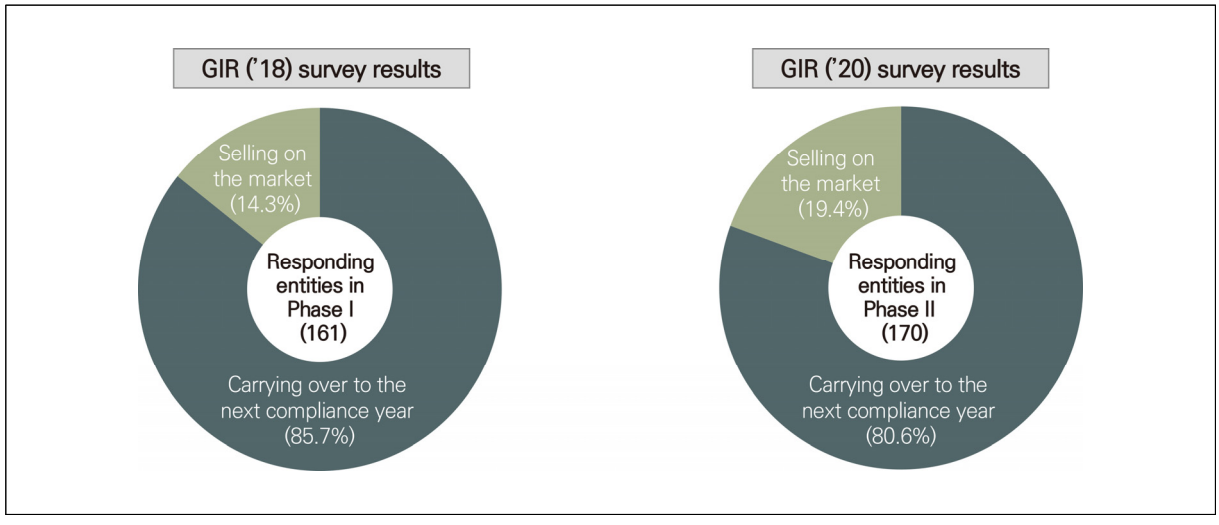
For entities of all sizes, engaging in emissions trading 2–4 times accounted for the highest proportion of responses. However, the proportion of entities that had engaged in emissions trading 5–9 times was second highest for large and mid-sized companies while the proportion of entities that had engaged in emissions trading once was second highest for small-sized companies. Other entities (public institutions) exhibited a different pattern, with the proportion of entities that had engaged in emissions trading at least 10 times or once being high. Broken down by sector, the proportion of entities that had engaged in emissions trading at least 10 times was highest for the power sector (60.9%, 14 entities) and public services and other sectors (40.0%, 2 entities), while the proportion of entities that had engaged in emissions trading 2–4 times was highest for the industry (52.4%, 99 entities), buildings (63.6%, 7 entities), and waste (47.1%, 8 entities) sectors. The proportion of entities that had never engaged in emissions trading was highest for the transport sector (86.7%, 13 entities).

〈Figure Ⅳ-7〉 Experience in Emissions Trading and Number of Transactions



In terms of the methods for dealing with surplus emission permits, as in Phase Ⅰ, the number of entities that stated that carrying the permits over to the next compliance year was their primary option (80.6%, 137 entities) was higher than the number of entities that stated that they wanted to sell them on the market (19.4%, 33 entities). The reasons for choosing to carry over the emission permits included an increase in emissions expected due to the growth of the company and the increase in production (48.2%, 66 entities), an expected increase in the price of emission permits due to the supply shortage of emission permits on the market (28.5%, 39 entities), the deferment of decision-making on selling due to uncertainty in the market and policy (19.7%, 27 entities), and the cost burden associated with searching for purchasers and negotiating trading conditions (1.5%, 2 entities). Other reasons (2.2%, 3 entities) included an expected shortage of emission permits due to a decrease in allocation. The reasons for choosing to sell the permits on the market included an expected decrease in the emission permit price (30.3%, 10 entities), a decrease in the emissions expected due to downsizing of the business (24.2%, 8 entities), the lack of a particular reason to hold the surplus emission permits (24.2%, 8 entities), and the supply of governmental reserves expected in the case of a lack of emission permits (9.1%, 3 entities). Other reasons (12.1%, 4 entities) included selling emission permits due to exceeding the limit on the banking of surplus emission permits and seeking sales profits for the company.

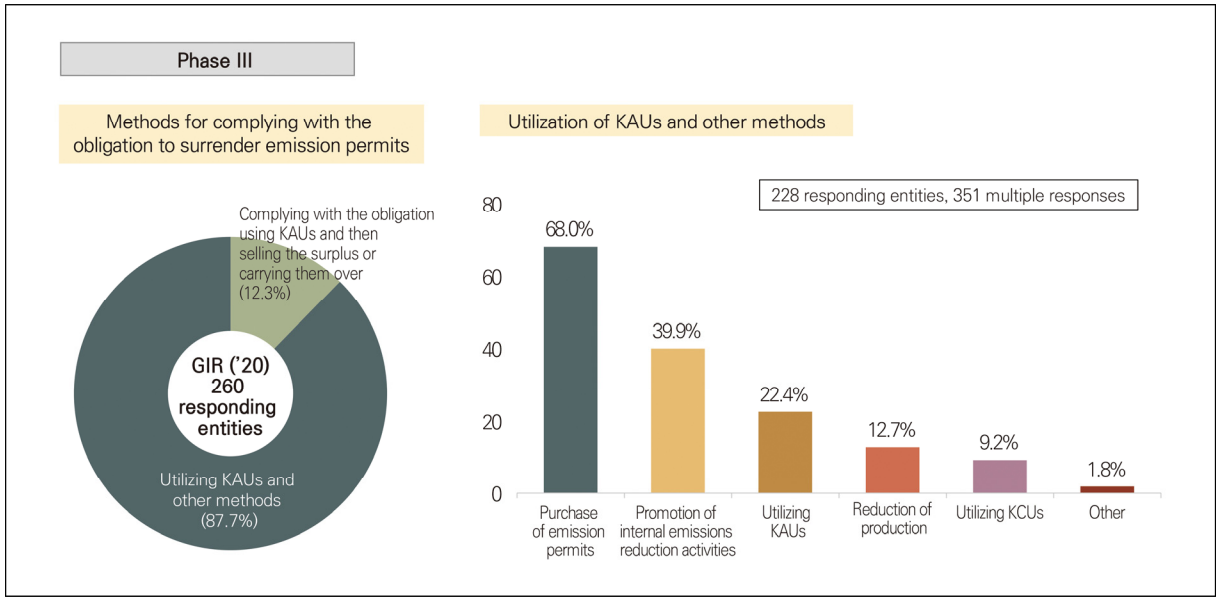
〈Figure Ⅳ-8〉 Methods for Dealing with Surplus Emission Permits by Phase



3 K-ETS Response and Prospects for Phase Ⅲ

In terms of the Phase Ⅲ forecast for the methods for complying with the obligation to surrender emission permits, the proportion of responding entities saying that they will meet their obligations by purchasing emission permits (68.0%, 155 responses) was very high, followed by those saying that they will implement internal emissions reduction activities (39.9%, 91 responses) and use KAUs (22.4%, 51 responses).

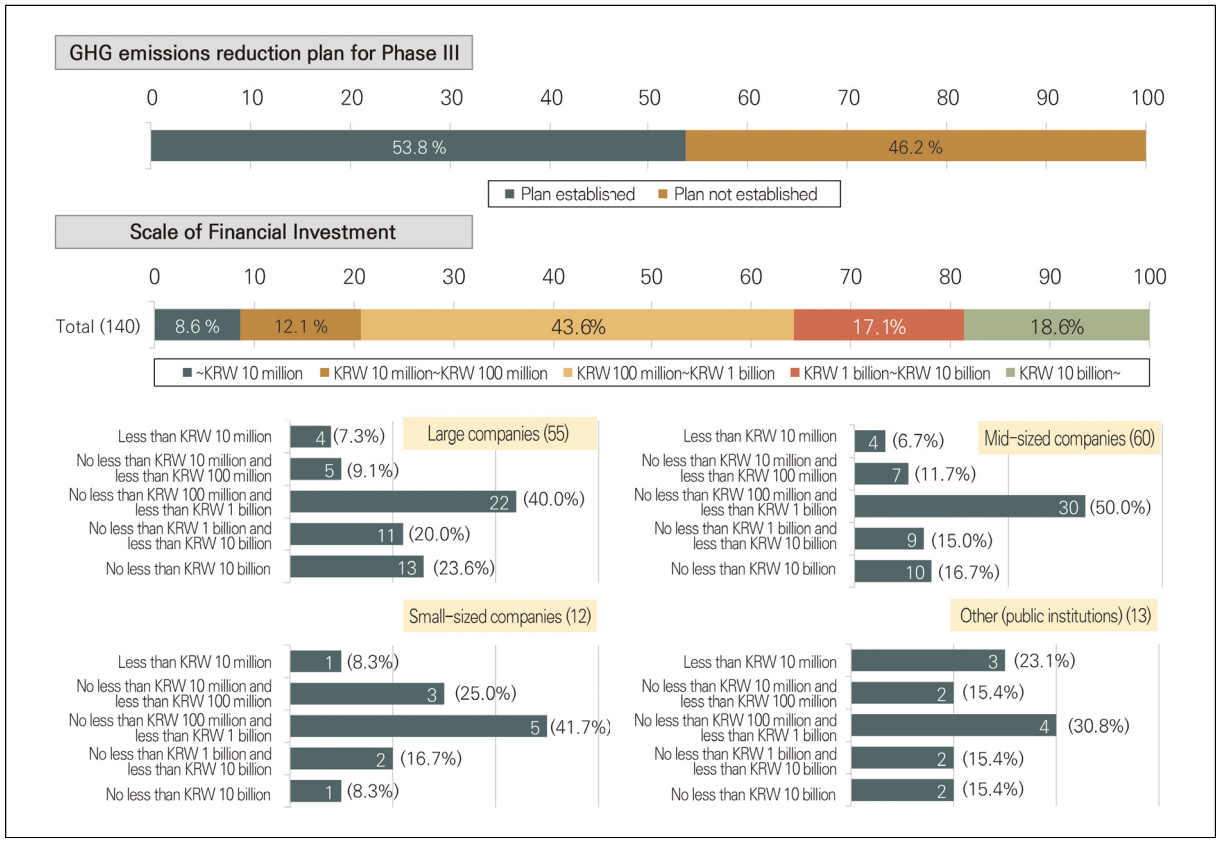
〈Figure Ⅳ-9〉 Methods for Meeting Emissions Allowances



The percentage of entities that responded they will not trade emission permits during Phase Ⅲ was 4.2% (11 responses), which was lower than that of entities that had not engaged in emissions trading during Phase Ⅱ (12.7%, 33 responses). An insufficient amount of emission permits allocated during Phase Ⅲ could become a driving force for covered entities' participation in emissions trading. In terms of the appropriateness of the amount of emission permits allocated for Phase Ⅲ, 66.2% (172) of the responding entities claimed that the amount of allocated emission permits appeared to be insufficient, followed by 32.3% (84) saying that the amount appeared to be appropriate and 1.5% (4) saying that the amount appeared to be excessive.

Of the 260 responding entities, 140 (53.8%) stated that they had established a GHG emissions reduction plan for Phase Ⅲ. The budget allocated for investment in technologies and reduction activities was no less than 100 million won and less than 1 billion won for 61 entities (43.6%), no less than 10 billion won for 26 entities (18.6%), no less than 1 billion won and less than 10 billion won for 24 entities (17.1%), no less than 10 million won and less than 100 million won for 17 entities (12.1%), and less than 10 million won for 12 entities (8.6%). The proportion of entities planning to invest no less than 10 billion won was slightly higher compared to Phase Ⅱ. Broken down by entity size, (ⅰ) 40.0% (22) of large companies responded that they will invest no less than 100 million won and less than 1 billion won, and 23.6% (13) responded that they will invest no less than 10 billion won, (ⅱ) 50.0% (30) of mid-sized companies responded that they will invest no less than 100 million won and less than 1 billion won, and 16.7% (10) responded that they will invest no less than 10 billion won, and (ⅲ) 41.7% (5) of small-sized companies responded that they will invest no less than 100 million won and less than 1 billion won, and 25.0% (3) responded that they will invest no less than 10 milllion won and less than 100 million won. It was found that, compared to Phase Ⅱ, the entities had allocated a larger budget to the overall emissions reduction activities. There was no clear significance in the responses of other entities.

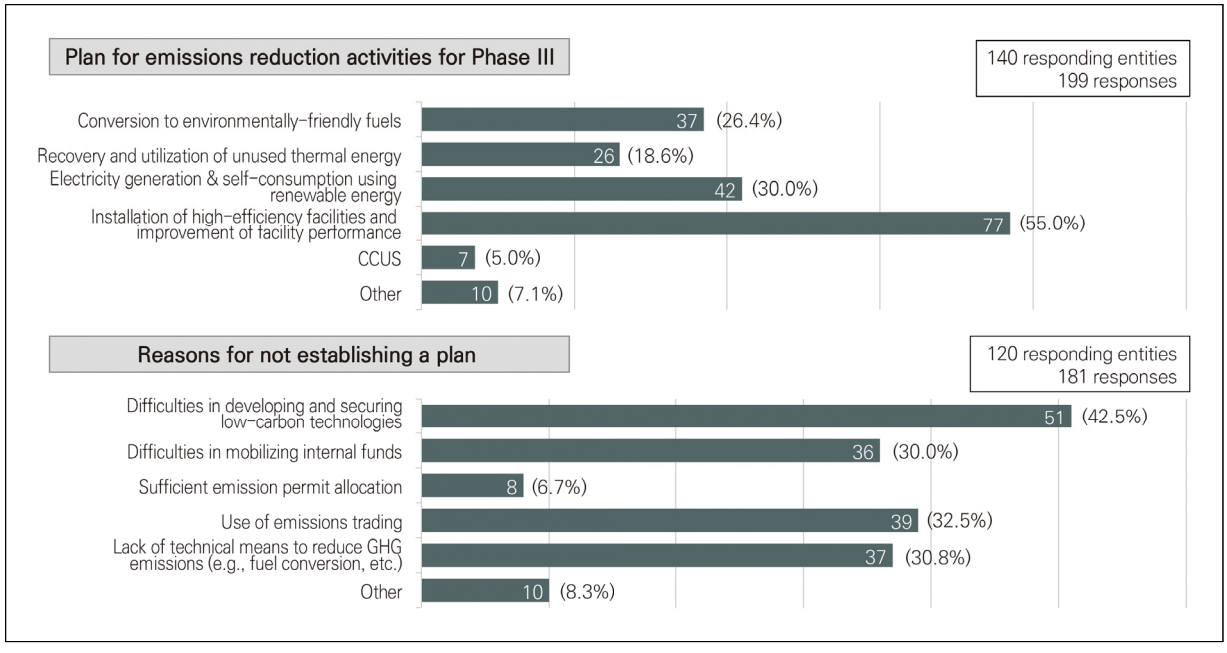
〈Figure Ⅳ-10〉 GHG Emissions Reduction Plan and Scale of Financial Investment for Phase Ⅲ



According to the analysis of specific plans for the investment in technologies and reduction activities of 140 entities with a GHG emissions reduction plan, similar to the reduction activities conducted during Phase Ⅱ, the most common response of the entities was the installation of high-efficiency facilities and improvement of facility performance (55.0%, 77 responses), followed by electricity generation and self-consumption using renewable energy (30.0%, 42 responses), conversion to environmentally-friendly fuels (26.4%, 37 responses), recovery and utilization of unused thermal energy (18.6%, 26 responses), and implementation of CCUS (5.0%, 7 responses). Other responses (7.1%, 10 responses) included the use of the green premium system, the replacement of old vehicles and the reduction of their use, and no specific plan decided.

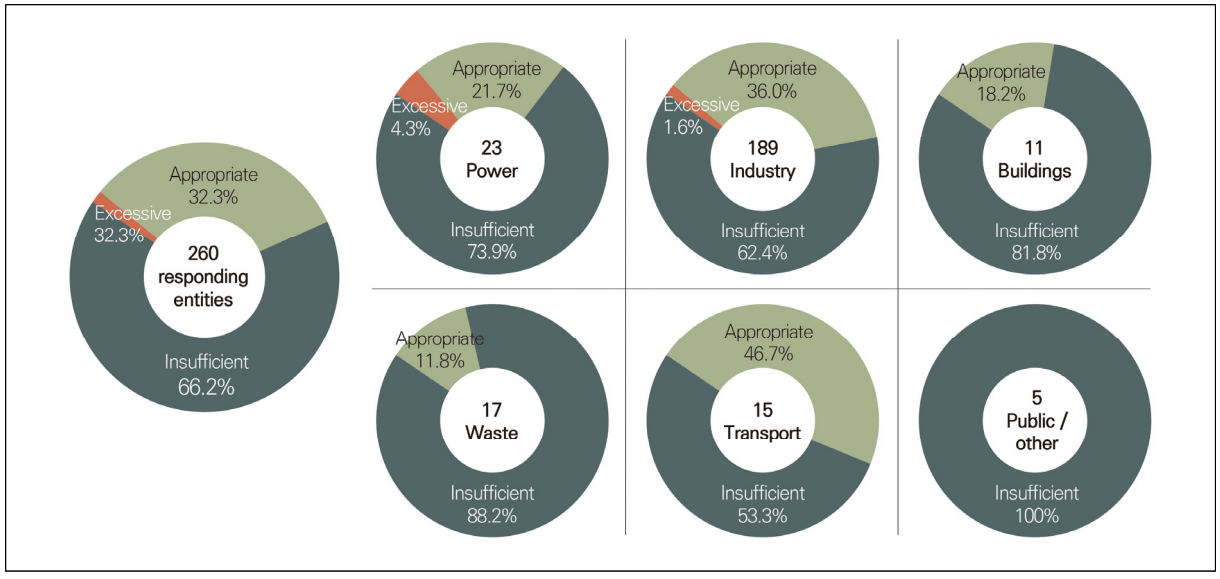
For the 120 entities that reported that they had not established a plan, the most common reason for not establishing a plan was difficulties in developing and securing low-carbon technologies (42.5%, 51 responses). Additional reasons were evenly distributed across the plan to use emissions trading (32.5%, 39 responses), the lack of technical means to reduce GHG emissions (30.8%, 37 responses), and difficulties in mobilizing internal funds for the implementation of reduction activities (30.0%, 36 responses). Other reasons (8.3%, 10 responses) included the absence of internal reduction targets, being in the progress of developing a reduction plan, a shortage of experts, and the promotion of external offset projects.

〈Figure Ⅳ-11〉 Plan for Emissions Reduction Activities for Phase Ⅲ and Reasons for Not Establishing a Plan (up to two responses allowed)



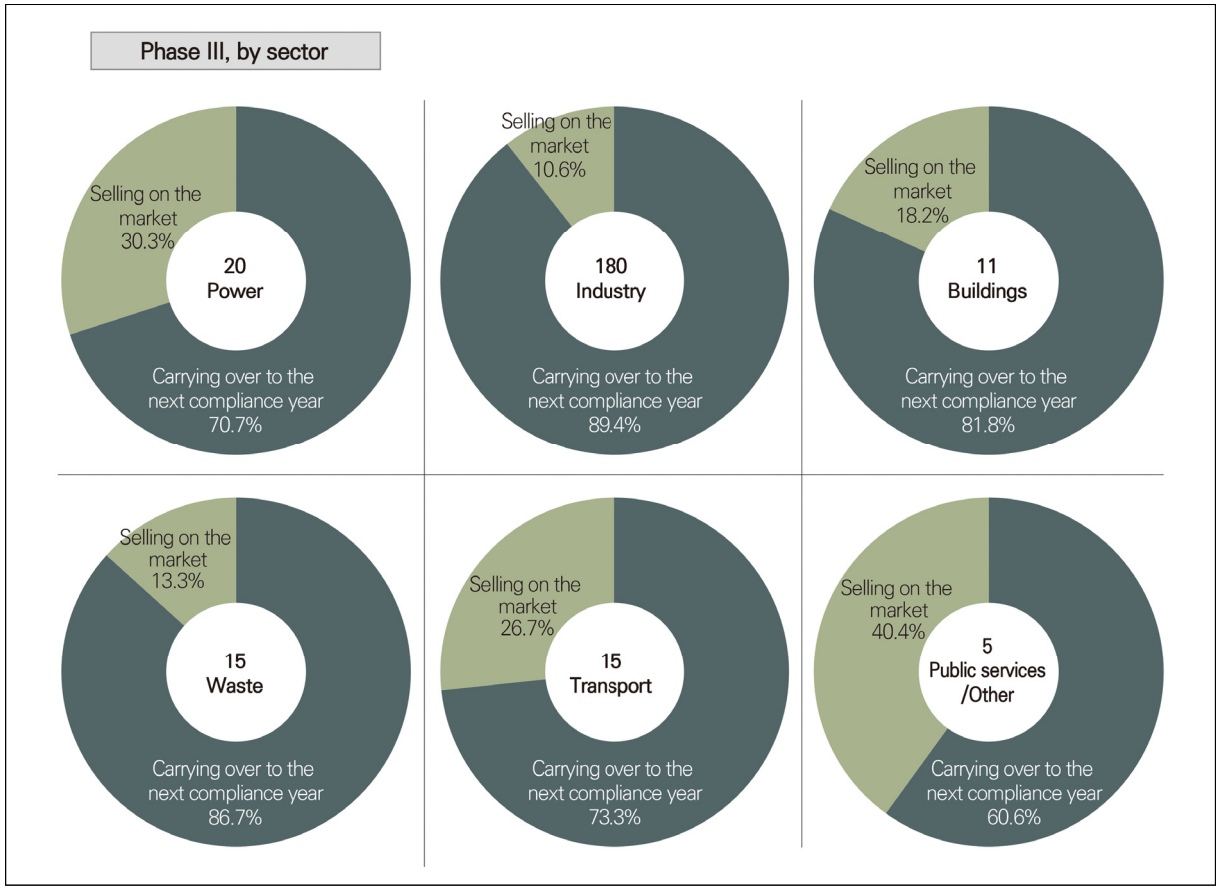
In terms of the appropriateness of the allocation by sector, the number of entities claiming that the amount of allocated emission permits appeared to be insufficient was higher than those claiming otherwise in all sectors: power (insufficient: 73.9%, appropriate: 21.7%, excessive: 4.3), industry (insufficient: 62.4%, appropriate: 36.0%, excessive: 1.6%), buildings (insufficient: 81.8%, appropriate: 18.2%), waste (insufficient: 88.2%, appropriate: 11.8%), transport (insufficient: 53.3%, appropriate: 46.7%), and public services/other sectors (insufficient: 100.0%). However, the proportion of entities stating that the emission permits allocations appeared to be appropriate was relatively high in the transport and industry sectors.

〈Figure Ⅳ-12〉 Appropriateness of the Amount of Allocated Emission Permits



With respect to the methods for dealing with surplus emission permits after the surrender of the permits, covered entities preferred carrying the permits over to the next compliance year over selling them on the market during Phases Ⅰ and Ⅱ, and this trend is expected to continue in Phase Ⅲ. According to the survey results, 14 responding entities (5.4%) reported that they had not decided on the method for dealing with surplus emission permits and, of the remaining 246 entities, 85.8% (211) reported that carrying the permits over to the next compliance year was their primary option, while 14.2% (35) stated that the sale of these permits on the market was their primary option. In terms of the sector, carrying the permits over to the next compliance year was preferred in all sectors, in particular, in the industry (89.4%, 161 entities), waste (86.7%, 13 entities), and buildings (81.8%, 9 entities) sectors.

〈Figure Ⅳ-13〉 Methods for Dealing with Surplus Emission Permits by Sector

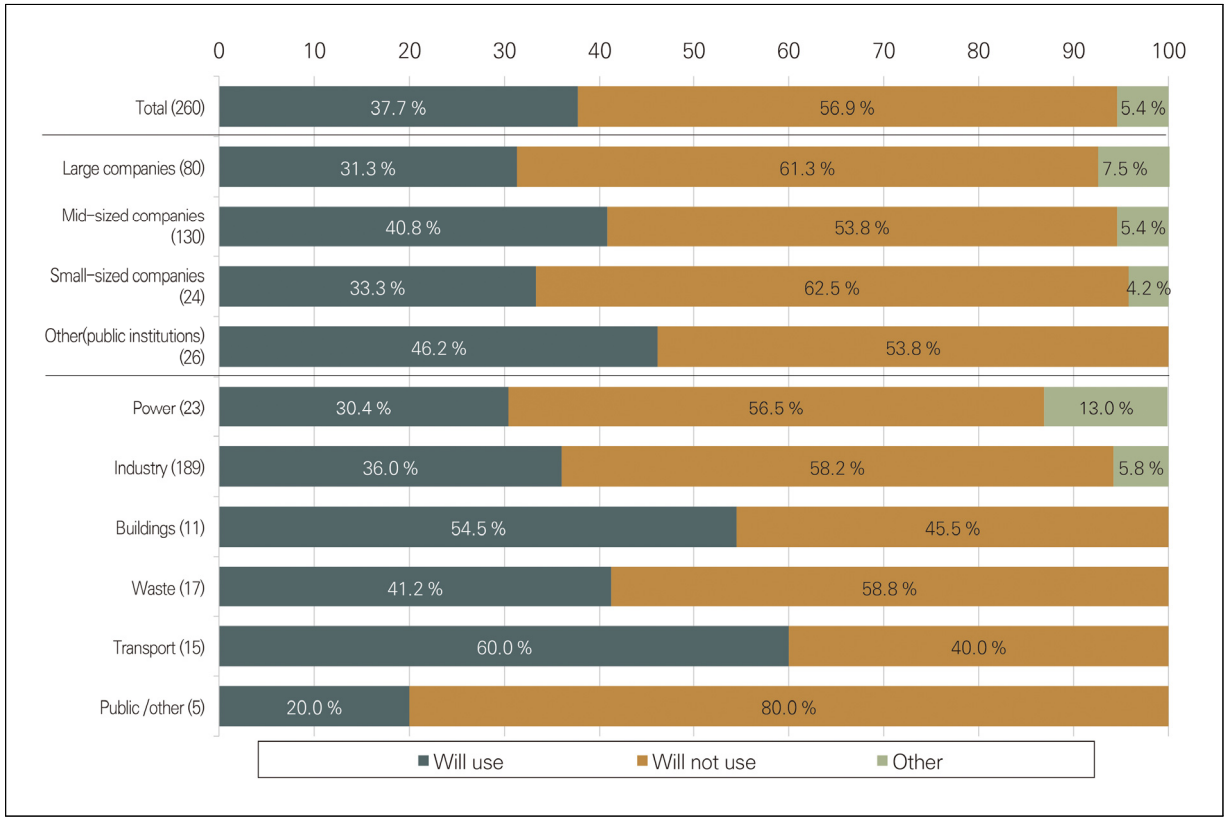


For Phase Ⅲ, emission trade brokerage companies[32] are able to participate in emissions trading by selling and purchasing emission permits for their own account. The survey asked the responding entities whether they would be willing to use the consignment trading of emission permits if it were allowed on the exchange market. Of the 260 responding entities, 148 (56.9%) stated that they would not be willing to use consignment trading, followed by 98 (37.7%) saying that they would be willing to use it and 14 (5.4%) choosing "other". These other responses included monitoring market trends, possible utilization after reviewing the performance of emission trading brokerage companies, and plans for an internal review. The response that they would not be willing to use the consignment trading of emission permits was high among entities of all sizes, while the response that they were willing to use consignment trading accounted for 46.2% of other entities (12 entities), 40.8% of mid-sized companies (53 entities), 33.3% of small-sized companies (8 entities), and 31.3% of large

32) An emission trade brokerage company is an investment broker defined in Article 8(3) of the Financial Investment Services and Capital Markets Act that engages in the business of brokering the simultaneous trading of emission permits for multiple parties through information and telecommunications networks or electronic information processing systems (Art. 36 of the Enforcement Decree).

companies (25 entities). In terms of the sector, more than half of the responding entities stated that they would be willing to use consignment trading in the buildings (54.5%, 6 entities) and transport (60.0%, 9 entities) sectors.

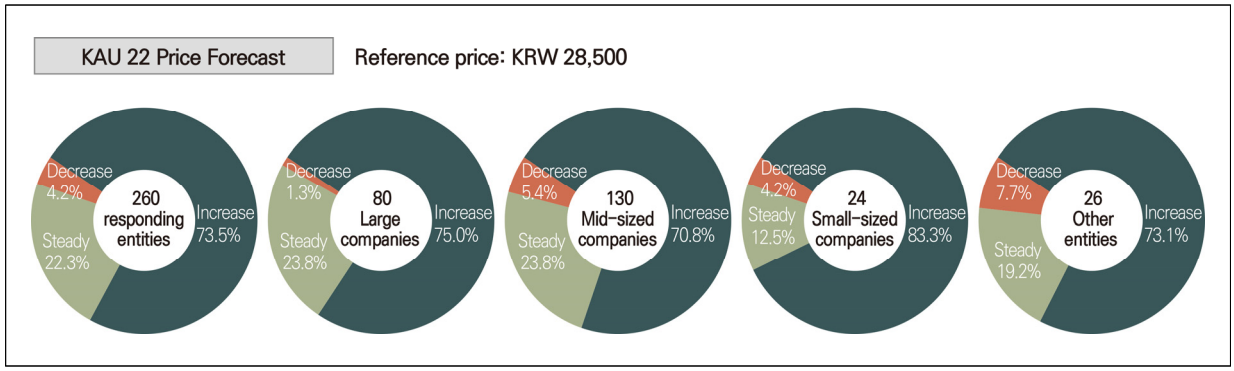
〈Figure Ⅳ-14〉 Use of the Consignment Trading of Emission Permits through an Emission Trade Brokerage Company



In terms of forecasting the average emission permit price for 2022, with reference to the closing price for KAU21 on September 15, 2021 (28,500 won), 73.5% (191) of the responding entities expected an increase, 22.3% (58 entities) expected a steady price, and 4.2% (11 entities) expected a decrease.[33] This corresponds closely with the results of the previous GIR survey (2019); in the survey, the average KAU22 price for December 2022 was expected to reach 32,239 won. In terms of the entity size, the proportion of entities that expected an increase in the price was highest among small-sized companies, while the proportion of entities that expected a decrease in the price was highest among other entities.

33) In the previous survey, 70.0% (205) of the responding entities anticipated an increase (reference price: 21,700 won, the closing price on September 18, 2020), 18.1% (53) anticipated a steady price, and 11.9% (35) anticipated a decrease.

〈Figure Ⅳ-15〉 Forecasts for the Trading Price of Emission Permits

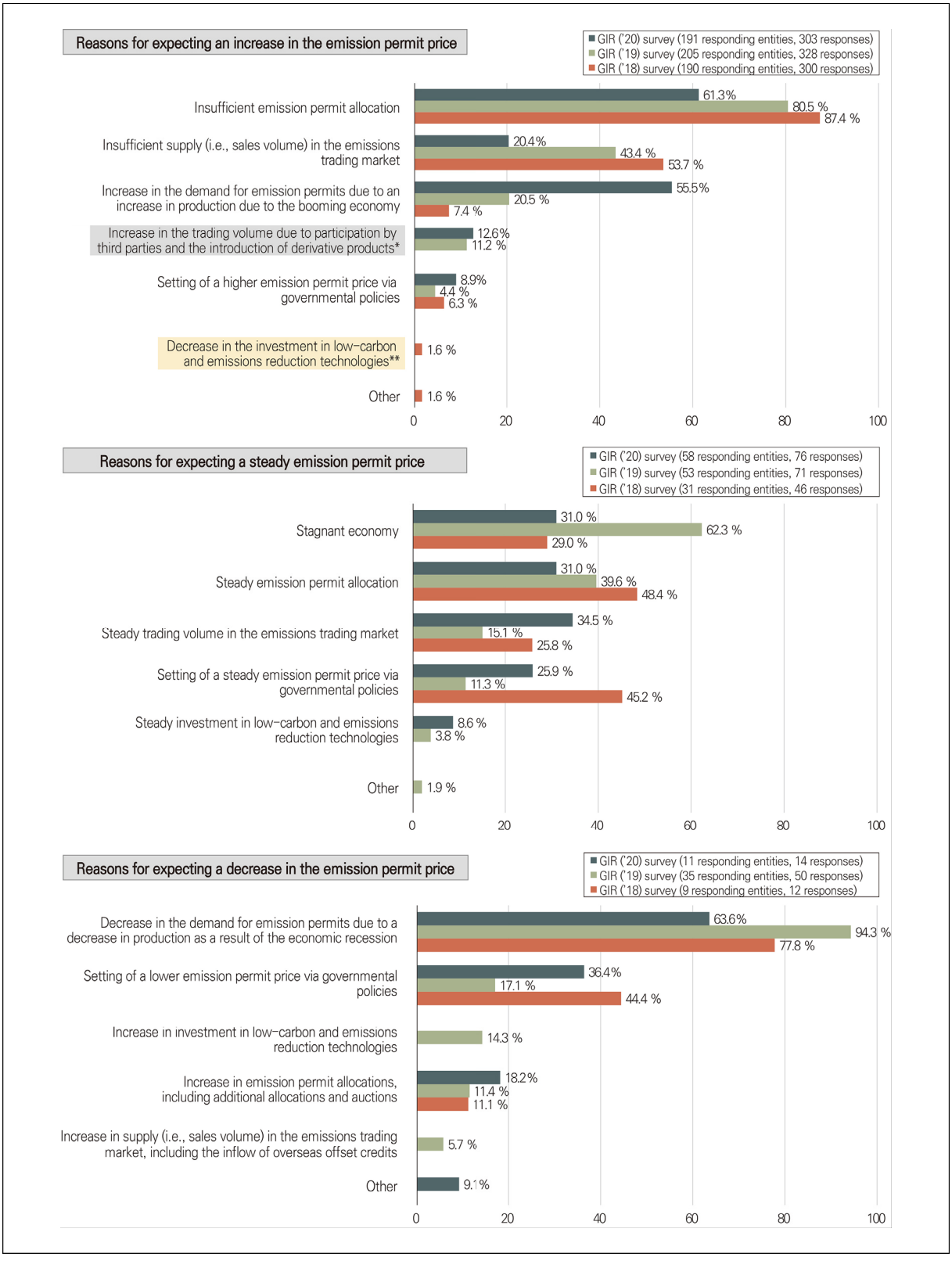


The top two reasons for expecting an increase in the emission permit price were an insufficient emission permit allocation (61.3%, 117 responses) and an increase in the demand for emission permits due to an increase in production resulting from the booming economy (55.5%, 106 responses). These differed from the top two reasons selected for expecting an increase in the emission permit price in the previous surveys, which were an insufficient emission permit allocation (2019 GIR: 80.5%, 2018 GIR: 87.4%) and an insufficient supply of emission permits in the emissions trading market (2019 GIR: 43.4%, 2018 GIR: 53.7%).

The reasons for expecting a steady emission permit price were the steady trading volume of emission permits in the emissions trading market (34.5%, 20 responses), a steady emission permit allocation (31.0%, 18 responses), and a stagnant economy (31.0%, 18 responses). This ranking differed in terms of the previous survey; the top two reasons for expecting a steady emission permit price were a stagnant economy (62.3%) and a steady emission permit allocation (39.6%) in the previous survey.

The main reasons for expecting a decrease in the emission permit price were the decrease in the demand for emission permits due to a decrease in production as a result of an economic recession (63.6%, 7 responses) and the setting of a lower emission permit price via governmental policies (36.4%, 4 responses). The top two reasons selected for the present survey were the same as those selected for the previous survey.

〈Figure Ⅳ-16〉 Reasons for Forecasting the Trading Price for Emission Permits

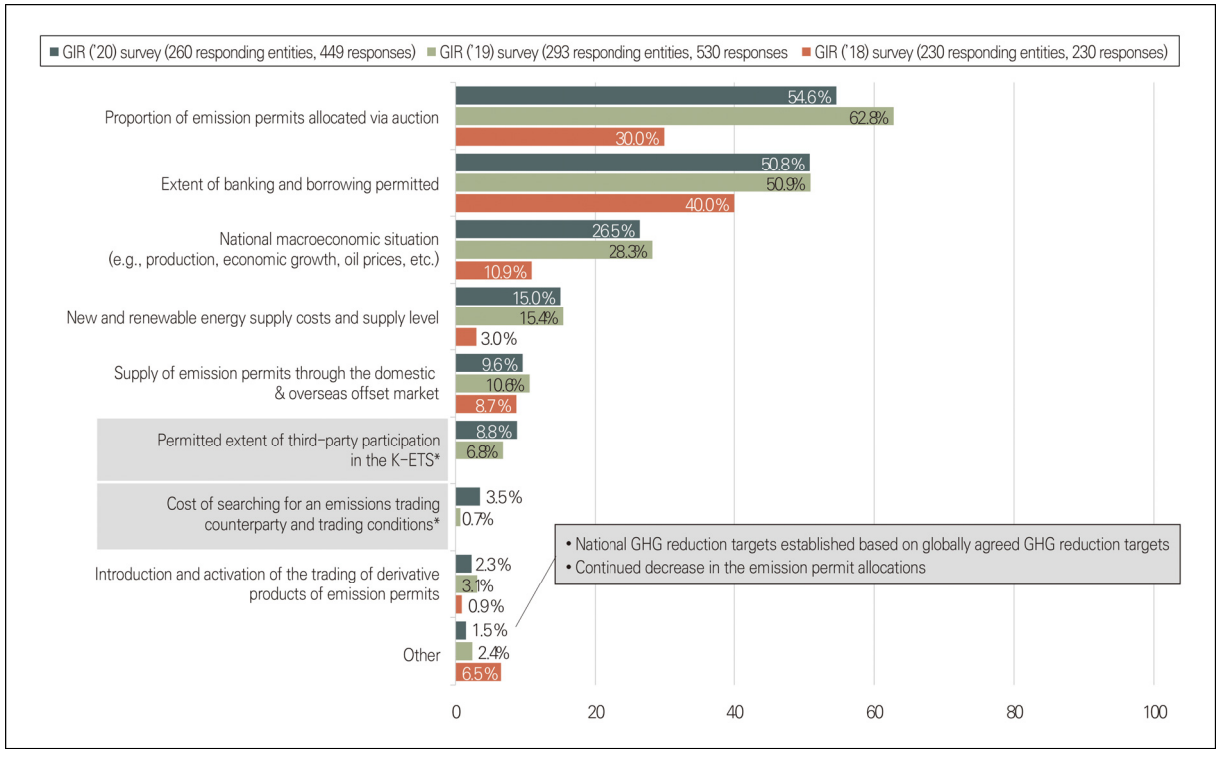


* Survey item included only in the survey by the GIR in 2019 and 2020.

** Survey item included only in the survey by the GIR in 2018.

The factors identified by the entities as affecting the market price of emission permits were the proportion of emission permits allocated via auction (54.6%, 142 responses), the extent of banking and borrowing permitted (50.8%, 132 responses), and the national macroeconomic situation (26.5%, 69 responses), which were the same as in the previous survey. Other factors (1.5%, 4 responses) included national GHG reduction targets established based on globally agreed GHG reduction targets and a continued decrease in the emission permit allocations.

〈Figure Ⅳ-17〉 Key Factors Affecting the Market Price for Emission Permits (up to two responses allowed)

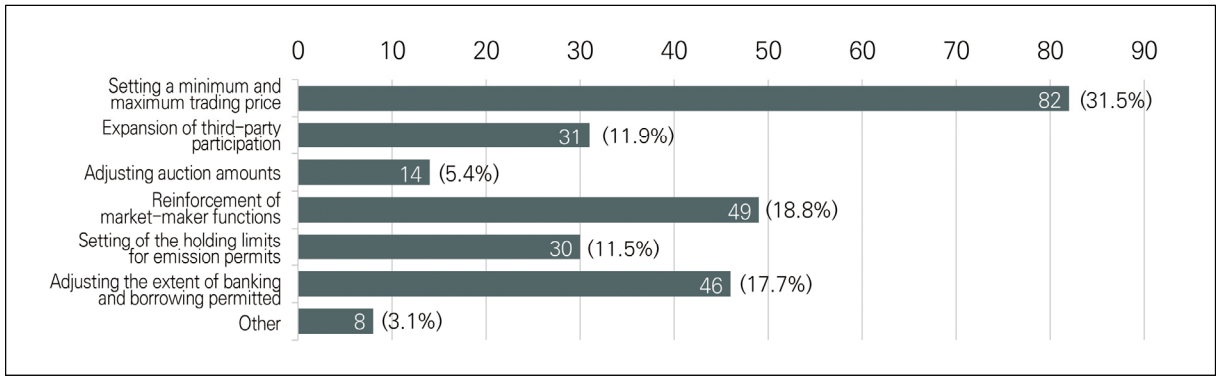


* Survey item included only in the survey by the GIR in 2019 and 2020.

In terms of the methods for responding to sudden fluctuations in the emission permit price, the largest proportion of entities chose the setting of a minimum and maximum trading price (31.5%, 82 entities), followed by those who chose the reinforcement of market-maker functions (18.8%, 49 entities), adjusting the extent of banking and borrowing permitted (17.7%, 46 entities), expansion of third-party participation (11.9%, 31 entities), setting of holding limits for emission permits (11.5%, 30 entities), and adjusting auction amounts (5.4%, 14 entities). The results indicated that entities preferred price-based emission permit price stabilization measures. Other responses (3.1%, 8 entities) included no need for government intervention, the introduction of a fixed price system,

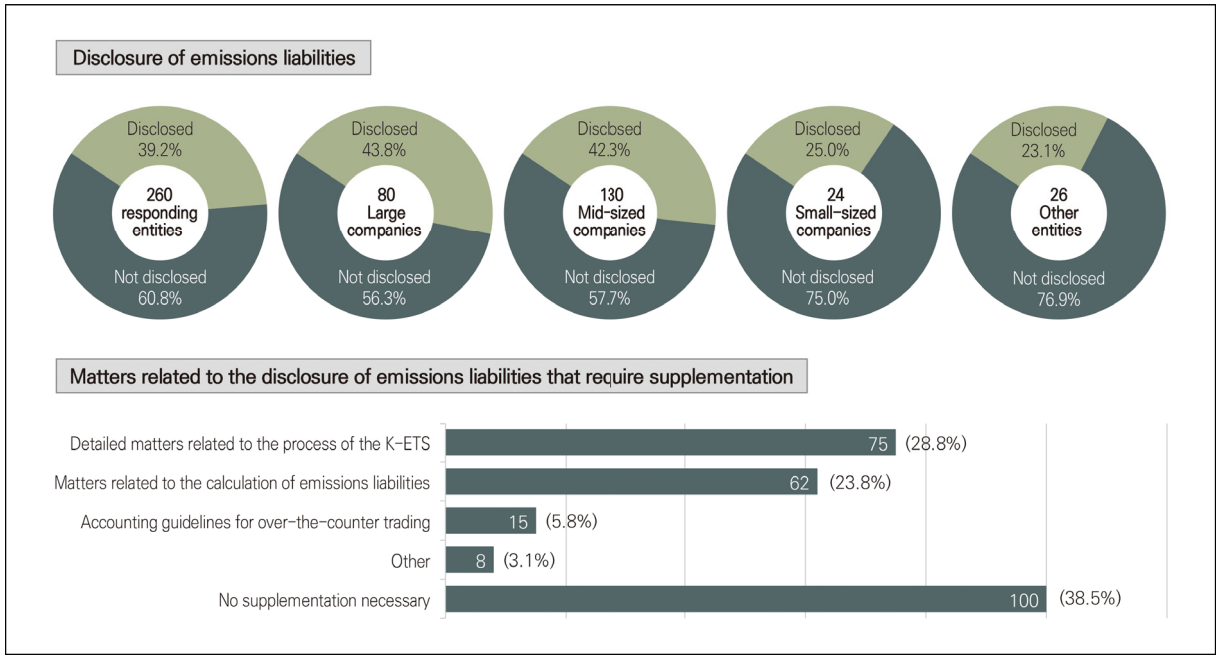
extension of the period for surrendering emission permits, and the introduction of the unlimited banking of emission permits.

〈Figure Ⅳ-18〉 Methods for Responding to Sudden Fluctuations in the Price of Emission Permits



In terms of the disclosure of emissions liabilities, the number of entities that reported that they had not disclosed this information (60.8%, 158 entities) was 1.5 times higher than the number of entities that reported that they had disclosed it (39.2%, 102 entities). In terms of entity size, entities of all sizes reported that they had not disclosed their emissions liabilities: large companies (disclosure: 43.8%, non-disclosure: 56.3%), mid-sized companies (disclosure: 42.3%, non-disclosure: 57.7%), small-sized companies (disclosure: 25.0%, non-disclosure: 75.0%), and other entities (disclosure: 23.1%, non-disclosure: 76.9%). In particular, the number of entities reporting that they had not disclosed their emissions liabilities was relatively high for small-sized companies and other entities. In terms of the matters related to the disclosure of emissions liabilities that require supplementation, the most common response was that no supplementation was necessary (38.5%, 100 entities), followed by detailed matters related to the K-ETS-related processes such as additional allocation, allocation revocation, and the banking and borrowing of emission permits (28.8%, 75 entities), matters related to the calculation of emissions liabilities such as the expected amount of emissions, the expected allocation of emission permits, and the reference price (23.8%, 62 entities), and accounting guidelines for over-the-counter trading (5.8%, 15 entities). Other responses (3.1%, 8 entities) included the lack of understanding and non-consideration of emissions liabilities.

〈Figure Ⅳ-19〉 Disclosure of Emissions Liabilities and Matters Requiring Supplementation



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