Government Publication Registration Number
11-1480906-000007-10

Phase II (2018–2020)

2019 Korean Emissions Trading System Report

Ministry of Environment
Greenhouse Gas Inventory and Research Center of Korea

Notes for the Reader

❶ This report analyzes the implementation results (7 Nov. '18 to 5 Nov. '20) for the Korean Emissions Trading System (K-ETS) including the allocation, trading, and surrender of emission permits for liable 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 NGMS, ETRS, ORS, and KRX:

- **National GHG Management System (NGMS)**: a database for the Greenhouse Gas (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 and trading of emission permits, GHG emissions of liable entities, 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 tons (t), one thousand tons (kt), and one million tons (Mt) as the primary units for the allocation and surrender of emission permits by converting GHG emissions into CO_2 equivalent tons ($tCO_2eq.$) based on their global warming potential. However, when describing transactions for emission permits, abbreviations (KAU, KCU, and KOC) are used for the emission permit units.

- **$1tCO_2eq.$ = 1 KAU = 1 KCU = 1 KOC**
- **Korean Allowance Unit (KAU)**: emission permits allocated to liable entities in accordance with Article 12 of the Act.
- **Korean Credit Unit (KCU)**: emission permits converted from the certified reductions derived from external offset projects 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, KOC will also be referred to as one of the emission permits in the text).

❺ For the implementation of Phase III of the K-ETS, the Act (which came into effect on 1 Jun. '20) and the Enforcement Decree of the Act (which came into effect on 18 Aug. '20) (hereafter "the Enforcement Decree") were amended. However, pursuant to Supplementary Provisions Article 3 of the Act and Supplementary Provisions Article 6 of the Enforcement Decree, the pre-amendment provisions are applied to the additional allocation and allocation revocation of emission permits for Phase II ('18–'20).

Division		Phase II ('18–'20)	Phase III ('21–'25)
Act		Act on the Allocation and Trading of Greenhouse gas Emission Permits (came into force on 17 Jan. '19) (Act No.15836, partially amended on 16 Oct. '18)	Act on the Allocation and Trading of Greenhouse gas Emission Permits (came into force on 1 Jun. '20) (Act No. 17104, partially amended on 24 Mar. '20)
Enforcement Decree		Enforcement Decree of the Act on the Allocation and Trading of Greenhouse gas Emission Permits (came into force on 8 Feb. '19) (Presidential Decree No. 29518, amended 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 18 Aug. '20) (Presidential Decree No. 30944, wholly amended)
Guidelines	Allocation of Emission Permits	Guidelines for the Allocation, Allocation Adjustment, and Allocation Revocation of GHG Emission Permits (came into force on 31 Jul. '18) (Ministry of Environment Notification No. 2018-126, partially amended)	Guidelines for the Allocation, Allocation Adjustment, and Allocation Revocation of GHG Emission Permits (came into force on 24 Dec. '20) (Ministry of Environment Notification No. 2020-270, wholly amended)
	Emissions Reporting and Certification	Guidelines for the Reporting and Certification of Emissions under the GHG Emissions Trading System (came into force on 1 Jan. '20) (Ministry of Environment Notification No. 2019-245, partially amended)	
	Verification	Guidelines for the Verification of the Operations of the GHG Emissions Trading System (came into force on 2 May '18) (Ministry of Environment Notification No. 2018-70, partially amended)	
	Emissions Trading	Notification on GHG Emissions Trading (came into force on 1 May '18) (Ministry of Environment Notification No. 2018-67, partially amended)	
		Regulations for the Additional Allocation of Emission Permits for Auctions and Market Stabilization Measures (came into force on 8 May '20) (Ministry of Environment Notification No. 2020-108, partially amended)	
		Notification on the Supervision of the Emissions Exchange (came into force on 1 May '18) (Ministry of Environment Notification No. 2018-68, partially amended)	
		Notification on Application Qualifications and Evaluation Standards for the Emissions Exchange (came into force on 1 May '18) (Ministry of Environment Notification No. 2018-69, partially amended)	
	Offset Mechanisms	Guidelines for the Feasibility Assessment of External Offset Projects and the Certification of Reductions (came into force on 28 Jun. '18) (Ministry of Environment Notification No. 2018-98, partially amended)	

❻ Following the amendment of the Act and 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 entities and the succession of rights and obligations were newly enacted, the scope of benchmarked sub-sectors was expanded, the level of entities 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%.

Division	Phase II	Phase III	Act	Enforcement 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 with a trade intensity[1] of no less than 30%, or with production costs[2] of no less than 30%, or sub-sectors with 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 liable entity subject to auction are deducted	At least 10% of emission permits allocated to a liable entity subject to auction are deducted	-	Art. 18
Allocation Application	Applications are submitted by facilities	Applications are submitted by business establishments (allocation applications are prepared for all business establishments for an entity)	Art. 13	Art. 20
Reserves	Allowance reserves are used to allocate additional emission permits for market stabilization measures	The use and purpose[3] of allowance reserves are amended	Art. 18	Art. 30
Market Makers	-	Provisions for the roles, duties, and standards for the designation of market makers[4] of the emissions trading market are introduced	Art. 22-2	Art. 37
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

Division	Phase II	Phase III	Act	Enforcement Decree
Penalties	-	Standards for selecting entities 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	Provisions for the duties, roles, and standards for the designation of verification bodies and verifiers are introduced *Condition surveys, such as 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, the 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: For the stable operation of the emissions trading market, a market maker suggests ask and bid prices of emission permits or participates in emission permit transactions to revitalize emission permit transactions in the market established by an emissions exchange.

Summary

Foreword

An emissions trading system is a market-based scheme designed to cost-effectively meet a nation's greenhouse gas (GHG) reduction target by allocating a number of emission permits to liable entities that allow them to emit GHGs up to the limit set by the emissions allowances that they hold. Liable entities trade any surplus or deficit in their allowances through market transactions or purchase allowances through auction. The Korean Emissions Trading System (K-ETS) was launched in 2015, with its legal basis established in 2012 through the Act on the Allocation and Trading of Greenhouse gas Emission Permits (May '12) (hereafter "the Act") and the associated Enforcement Decree of the Act (Nov. '12) (hereafter "the Enforcement Decree"), followed by the Master Plan for the Emissions Trading System (Jan. '14) and the Allocation Plan for Phase I ('15–'17) (Sept. '14), which provided the details of the K-ETS. Phase I focused on securely establishing the K-ETS and accumulating experience, with the implementation of policies such as 100% free allocation, benchmarking as an allocation method for certain sub-sectors,[1] flexibility mechanisms (e.g., offset mechanisms, banking, and borrowing), and market stabilization measures.

When Phase II ('18–'20) began, the government introduced a new Master Plan and Allocation Plan, and amended relevant guidelines to ensure the more stable operation of the K-ETS. The significant changes were the introduction of auctions (3% of the allowances allocated to the liable entities) and market makers as a means to ensure the liquidity of the K-ETS market. Furthermore, unlimited banking of emission permits to the next compliance year within Phase I was restricted from Phase II,[2] and

1) Of the 26 sub-sectors, benchmarking was applied to three of them (cement, oil refining, and aviation) and grandfathering was applied to the others.

2) First Compliance Year: Banking is approved in any of the following amounts, whichever is greater:

① Three times the net amount of emission permits sold* by a liable 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 liable entity to the day before it applies for the banking of emission permits to the second compliance year)

② 75,000 KAUs for designated entities whose annual average emissions for the base year are no less than 125,000 tCO2-eq, and 15,000 KAUs for designated entities whose business establishment produces emissions of no less than 25,000 tCO_2-eq

Second Compliance Year: Banking is approved in any of the following amounts, whichever is greater:

① Twice the net amount of emission permits sold* by a liable entity in the second compliance year

benchmark-based allocation was expanded to seven sub-sectors[3] from the previous three.

For the implementation of Phase III ('21–'25) of the K-ETS, the government introduced a new Master Plan for the Emissions Trading System in December 2019 to lay the foundation for the operation of Phase III. It also amended the Act (Jun. '20) and the Enforcement Decree (Aug. '20) and established and announced a new Allocation Plan (Sep. '20).

The proportion of auctioned emission permits allocated to the entities in sub-sectors permitted to use auctions increased from 3% to 10% in order to actively reduce GHG emissions, and a plan was developed to expand the scope of market participants to include both liable entities and third parties to ensure the stability of the emissions trading market and improve the conditions for emissions trading. The allocation of emission permits was changed from the facility level to the business establishment level so that liable entities had the discretion to more flexibly establish their own reduction plan and reduce GHG emissions by improving their facilities and management. In addition, the number of benchmarked sub-sectors was further expanded to twelve sub-sectors[4] from the previous seven.

This report provides detailed information on the policies and implementation of the K-ETS for the 2019 compliance year, and comprehensively analyzes data related to the

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* 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 liable entity to the day before it applies for the banking of emission permits to the third compliance year)

② 50,000 KAUs for designated entities whose annual average emissions for the base year are no less than 125,000 tCO_2-eq, and 10,000 KAUs for designated entities whose business establishment produces emissions of no less than 25,000 tCO_2-eq

Third Compliance Year: Banking is approved in any of the following amounts, whichever is greater, to the first compliance year of Phase III:

① The annual net amount of emission permits sold* by a liable entity in Phase II

* (The amount of KAUs/KCUs sold − The amount of KAUs/KCUs purchased in Phase II) ÷ the number of the compliance years in Phase II applicable to the liable entity (from the day of allocation for Phase II to the liable entity to the day before it applies for the banking of emission permits to Phase III)

② 25,000 KAUs for designated entities whose annual average emissions for the base year are no less than 125,000 tCO_2-eq, and 5,000 KAUs for designated entities whose business establishment produces emissions of no less than 25,000 tCO_2-eq.

3) Oil refining, cement, aviation, power generation, integrated energy supply (residential), integrated energy supply (industrial), and waste.

4) Oil refining, cement, aviation, power generation, integrated energy supply (residential), integrated energy supply (industrial), waste, steel, petrochemicals, buildings, pulp, and wood.

overall K-ETS process, including the allocation of emission permits, the certification of actual emissions, and the surrender and trading of emission permits. The purpose of this report is to ensure that the entire K-ETS implementation process is transparent in a way that allows stakeholders to comprehensively understand it. In reference to previous reports,[5] this report reviews the operational results for Phase II, starting from the allocation process during the second compliance year ('19) and ending at the surrender of the emission permits. In Chapter I, the operational direction of the K-ETS is briefly explained, while the overall results for the allocation, certification, and surrender of emission permits are examined in Chapter II. An analysis of the performance of the emissions trading market and a survey of the liable entities participating in the K-ETS are summarized in Chapters III and IV, respectively.

● K-ETS Operational Results

During Phase II, the emissions cap was 1,777.1 Mt, consisting of pre-allocation to business entities (1,643.0 Mt) for six sectors – power, industry, buildings, transport (domestic transport), waste, and public services/other sectors – and a reserve for other purposes (78.3 Mt for power and 55.8 Mt for purposes other than power). The total emissions allowance during Phase II was 1,796.1 Mt, which included the cap (1,777.1 Mt) and a separate reserve for market stabilization measures and market making (19.0 Mt).

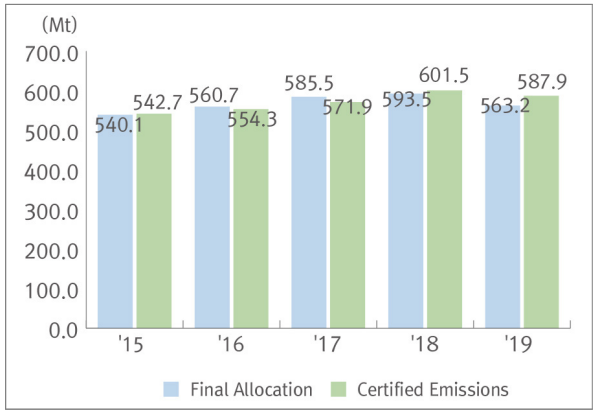
For the '19 compliance year, the final allocation was 563.2 Mt (for 610 business entities), consisting of 554.7 Mt from free allocation (98.5%) and 8.6 Mt from auctioned allowances (1.5%). The final allocation in '19 was 5.1% lower than the previous year (593.5 Mt). This was due to the revision of the cap after applying the Amended Basic Roadmap for Achieving 2030 National GHG Reduction Targets (Jul. '18) (hereafter "the amended Roadmap") to the Allocation Plan for Phase II, and the adjustment in the allocation resulting from mergers, splits, and the establishment of liable entities. The certified emissions for '19 amounted to 587.9 Mt (for 610 business entities), which was 2.3% lower than the previous year (601.5 Mt for 586 business entities).

5) K-ETS Report for the First and Second Compliance Years ('15–'16) of Phase I (Mar. '18, in Korean), Phase I ('15–'17) K-ETS Report (Jan. '19), and Phase II ('18–'20) 2018 K-ETS Report (Jan. '20), all published by Greenhouse Gas Inventory and Research Center of Korea.

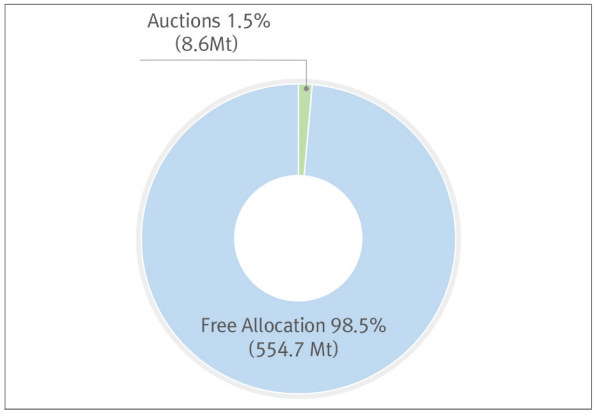
At the end of the '19 compliance year, the amount of emission permits surrendered by liable entities was 587.8 Mt, made up of 587.6 Mt from KAU19 (99.95%) and 0.3 Mt from KCU19 (0.05%). This was 2.3% lower than the 601.5 Mt of emission permits surrendered at the end of '18, which was made up of 601.0 Mt from KAU18 (99.9%) and 0.5 Mt from KCU18 (0.1%). Penalties will be imposed on one liable entity that failed to meet its obligation to surrender emission permits for '19 (0.03 Mt).

In terms of the flexibility mechanisms (offsets, borrowing, and banking) utilized in the surrendering of emission permits in '19, 0.3 Mt of KCUs (0.05% of the total amount surrendered), 35.6 Mt of the emission permits carried over from the previous compliance year (6.0% of the total amount surrendered), and 8.9 Mt of emission permits borrowed from the next compliance year (1.5% of the total amount surrendered) were used. After surrendering emission permits for '19, the amount of emission permits carried over to the next compliance year was 17.2 Mt. Compared to '18,[6] the amount of emission permits borrowed from the next compliance year increased (3.8 Mt, 74%) and the amount of emission permits carried over to the next compliance year decreased (18.3 Mt, 51%). It appears that this was because the amount of certified emissions as a share of the final allocation increased by 4.4% for '19 but only increased by 1.3% for '18, thus affecting the number of emission permits that were carried over or borrowed.

Final Allocation and Certified Emissions by Year



'19 Free Allocation and Auctions



[6] In '18, 0.5 Mt of KCUs (0.1% of the total amount surrendered), 37.7 Mt of emission permits carried over from the previous compliance year ('17; 6.3%), and 5.2 Mt of emission permits borrowed from the next compliance year ('19; 0.9%) were used. In addition, 35.6 Mt of emission permits were carried over into the next compliance year ('19).

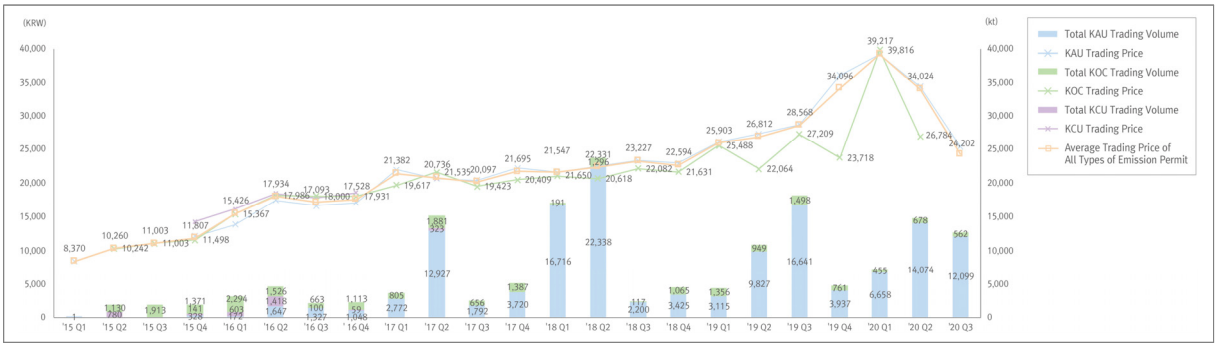
Analysis of Trading Market Performance

A total of 163.9 Mt of emission permits[7] was traded through the exchange and over-the-counter from the introduction of the K-ETS to the trading period in Phase II's second compliance year (from 1. Jan. '15 until 11 Sep. '20). Of this, 136.8 Mt of KAUs, 3.4 Mt of KCUs, and 23.7 Mt of KOCs were traded, accounting for 83.5%, 2.1%, and 14.4% of the total, respectively.

The average price of the emission permits during this period in exchange and over-the-counter transactions rose continuously from KRW 11,013 per ton in '15 to KRW 17,056 in '16, KRW 20,951 in '17, KRW 22,122 in '18, KRW 28,440 in '19, and KRW 31,492 in '20 (until the third quarter), resulting in an annual increase of 55.0%, 22.7%, 5.6%, 28.6%, and 10.7%, respectively. The average price for the entire trading period was KRW 24,624.

The continuous increase in the trading price and the growth in the trading volume also impacted the total payments, which rose from KRW 62.4 billion in '15 to KRW 204.1 billion in '16, KRW 550.3 billion in '17, KRW 1,047.5 billion in '18, KRW 1,083.1 billion in '19, and KRW 1,087.3 billion in '20, resulting in an annual increase of 227.3%, 169.5%, 90.4%, 3.4%, and 0.4%, respectively. The total payments for the entire period were KRW 4,034.6 billion, made up of KRW 3,531.9 billion in KAUs, KRW 55.4 billion in KCUs, and KRW 447.4 billion in KOCs (87.5%, 1.4%, and 11.1%), respectively.

Total Trading Volume and Price Trends for All Emission Permit Types



The total trading volume during the trading period (8 Nov. '18–11 Sep. '20) for only

7) KAU15·KAU16·KAU17·KAU18·KAU19·KAU20, KCU15·KCU16·KCU17·KCU18·KCU19, KOC

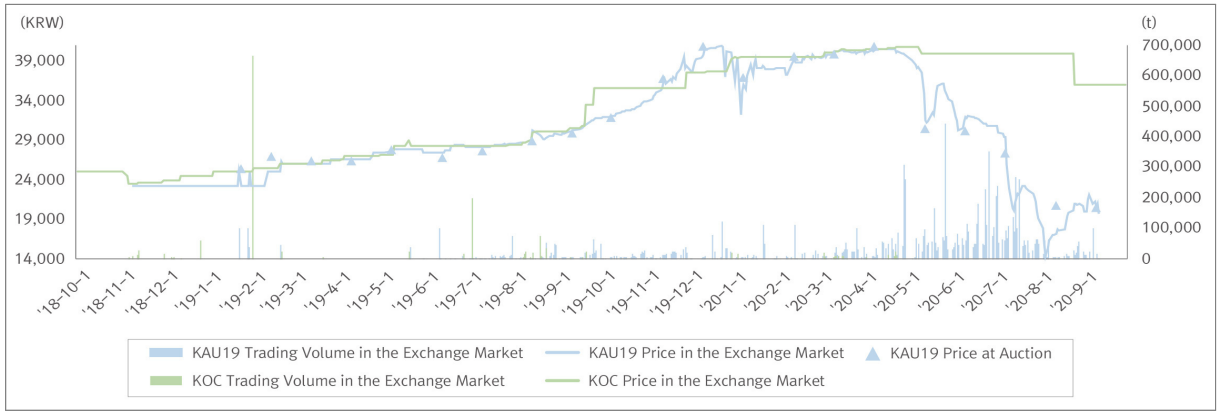
those emission permits subject to surrender during the second compliance year for Phase II (KAU19 and KCU19) was 45.2 Mt. Broken down by type of emission permit, KAUs accounted for 83.8% (37.9 Mt) and KOCs for 16.2% (7.3 Mt). Over-the-counter trading accounted for 54.6% (24.7 Mt), higher than the 45.4% for exchange trading (20.5 Mt). The total number of transactions during this period was 3,337; exchange trades accounted for 96.9% of these (3,235 transactions) compared to only 3.1% for over-the-counter trades (102 transactions).

Auctions for KAU19 were held once every month between July 2019 and July 2020, 13 times in total. The auctioned allowances accounted for 36.5% of the total trading volume in the first quarter of '20 and 35.4% in the fourth quarter of '19, the largest proportion of the total trading volume during these auction periods.

The trading price for KAU19 fell after April '20 due to the coronavirus disease (COVID-19) pandemic and consequent scheduling delays of the K-ETS, before rising again after Aug. '20. The highest and lowest prices for KAU19 were KRW 40,900 (23 Dec. '19) and KRW 14,329 (5 Aug. '20), respectively, and the highest and lowest prices for KOC were KRW 40,800 (23 Apr.–8 May '20) and KRW 22,200 (19 Mar.–23 May '18), respectively. The auction price for KAU19 was found to be similar to its exchange market price.

The trading volume of KAU19 began to rise rapidly in March '20, when the emissions reports were to be submitted, reaching its highest point in June, and decreased rapidly in September after the surrender of emission permits had ended in August.

Exchange Trading Prices for All Emission Permit Types



Analysis of a Survey of Liable Entities

A survey was conducted to examine the overall awareness of the K-ETS among liable entities, its implementation status, the participation of liable entities in emission permit trading, and emission permit price forecasts. A total of 611 liable entities from six sectors participating in the K-ETS were selected for the survey, of which 293 responded.

According to the key survey results, 22.2% of the responding entities expressed satisfaction with the K-ETS, while 40.6% stated that they were not satisfied.

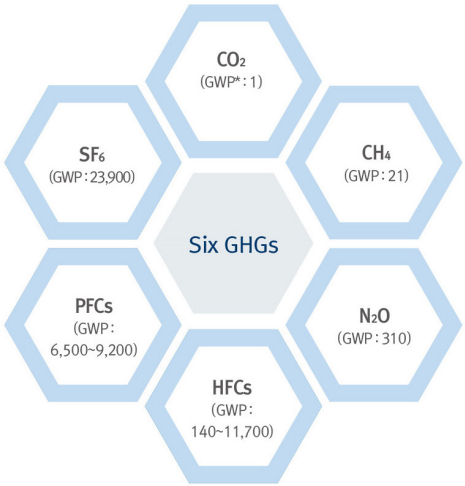
The key measures taken by the responding entities in response to the K-ETS were emission permit trading (62.1%), internal investment in facilities and technologies (56.3%), the use of external consulting services (23.2%), and the establishment of response strategies (20.1%).

In terms of how liable entities met their obligation to surrender their emission permits for Phase II, 16 entities (5.5%) responded that they had met their obligation to surrender emission permits through allocated emission permits alone, while 257 entities (87.7%) stated that they had met their obligation through allocated emission permits combined with other additional measures. Measures taken by the latter group of liable entities included a decrease in production (42.4%), the purchase of emission permits (40.9%), internal reduction activities (37.0%), and the use of allocated emission permits (24.1%).

K-ETS at a Glance

1. Gas coverage

Gas Coverage



GHG emissions: direct + indirect emissions
- Direct emissions of six GHGs
- Indirect emissions from electricity consumption

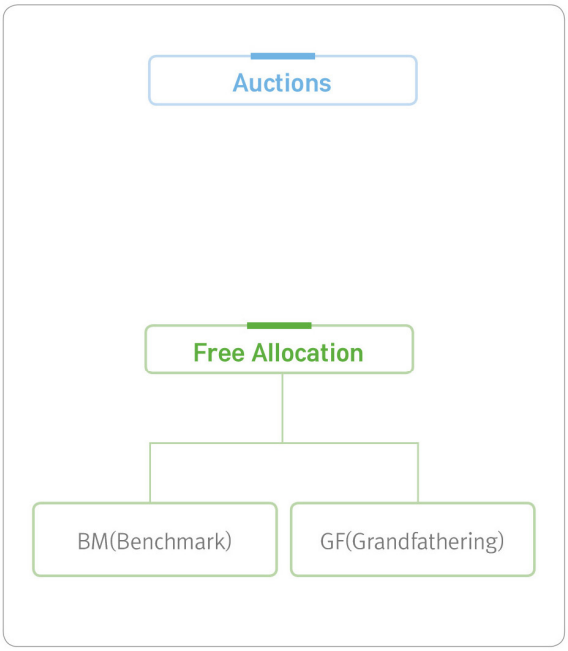
* GWP : Global Warming Potential

Sector Coverage

Six sectors

- [Power]
- [Transport (Domestic Aviation)]
- [Industry]
- [Waste]
- [Buildings]
- [Public services/ Other sectors]

Allocation methods



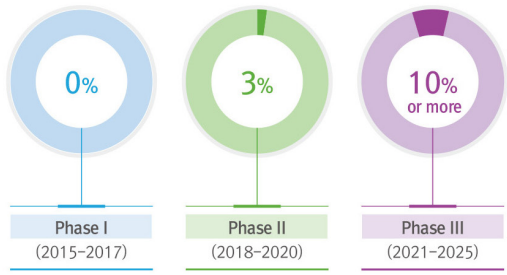
Covered Entities

Total average annual GHG emissions for the three years starting from the fourth preceding year before a phase

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

(Source) Act on the Allocation and Trading of Greenhouse gas Emission Permits, Art. 8

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 liable 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)	The reserve is used for 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 liable 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 years

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

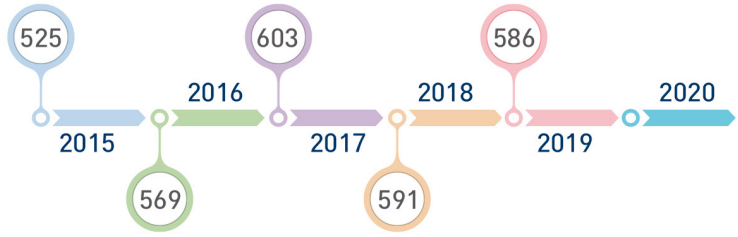
Step 3
- Calculate the sectoral ETS cap* for the relevant phase

* sectoral ETS cap = average sectoral reduction targets for the relevant phase × ETS emissions coverage for the base years

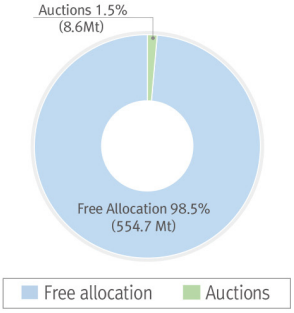
Step 4
- Calculate the ETS cap for the relevant phase (i.e., summing the ETS cap for each sector)

2. Operational Results

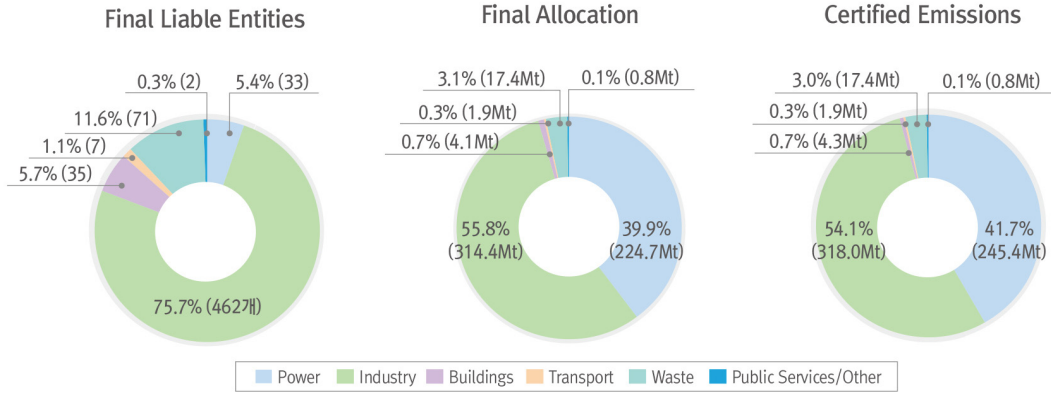
Number of Liable Entities Designated per Compliance Year



Free Allocation and Auctions



Distribution by sector



Compliance Results

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

Trading Market Performance

Growth of the Trading Market 2015 - 2019: Total Trading Volume 6× / Average Trading Price 2× / Total Payments 16×

	2015	2016	2017	2018	2019
Total Trading Volume	5.7 Mt	12.0 Mt	26.3 Mt	47.3 Mt	**38.0 Mt**
Average Trading Price	KRW 11,013	KRW 17,056	KRW 20,951	KRW 22,122	**KRW 28,440**
Total Payments	KRW 62.4 billion	KRW 204.1 billion	KRW 550.3 billion	KRW 1,047.5 billion	**KRW 1,083.1 billion**

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K-ETS Overview

Ⅰ. K-ETS Overview

1. Overview and Operational Direction

An emissions trading system is a market-based scheme designed to cost-effectively meet a nation's greenhouse gas (GHG) reduction target by allocating a number of emission permits to liable entities that allow them to emit GHGs up to the limit set by the emissions allowances that they hold. Liable entities trade any surplus or deficit in their allowances through market transactions or purchase allowances through auction. The Korean Emissions Trading System (K-ETS) was launched, with its legal basis established in 2012 through the Act on the Allocation and Trading of Greenhouse gas Emission Permits (May '12) (hereafter "the Act") and the associated Enforcement Decree of the Act (Nov. '12) (hereafter "the Enforcement Decree"), followed by the Master Plan for the Emissions Trading System (Jan. '14), and the Allocation Plan for Phase I ('15–'17) (Sept. '14), which provided the details of the K-ETS.

▶ **Summary of the K-ETS Operational Results for the First Compliance Year of Phase II ('18)**

During the compliance year of '18 in Phase II, a total of 593.5 Mt of emissions allowances (588.9 Mt from free allocation and 4.6 Mt from auctioned allowances) were allocated to 587 business entities from 62 sub-sectors. The final amount of certified emissions was 601.5 Mt, which was 8.0 Mt higher than the allocated amount. The amount of emission permits (KAU18, KCU18, and KOCs) traded in the emissions trading market until the surrender of the emission permits for '18 (1 Jan. '18–30 Sep. '19) was 39.7 Mt, with a transaction value of KRW 995.5 billion. The final amount of emission permits surrendered by liable entities was 601.5 Mt (601.0 Mt of KAU18 and 0.5 Mt of KCU18). Penalties were imposed on one liable entity that failed to meet its obligation to surrender its emission permits (1.4 kt). In addition, 35.6 Mt of emission permits were carried over into the next compliance year ('19).

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

Division	Phase I ('15–'17)	Phase II ('18–'20)	Phase III ('21–'25)
Main Objectives	• Acquire experience and stabilize the K-ETS	• Substantially reduce GHG emissions	• Promote effective reductions
K-ETS Operations	• Improve flexibility of the K-ETS, e.g., the ratio of offset credits, etc. • Establish necessary infrastructure for accurate monitoring, reporting, and verification (MRV)	• Expand the applicable scope of the K-ETS and raise the targets • Develop various standards, e.g., emissions reporting, verification, etc.	• Reinforce the setting of 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 use of auctions • Expand the use of benchmarking for allocation

Source: Master Plan for the Emissions Trading System (Ministry of Economy and Finance, '17)

Whereas Phase I focused on firmly establishing the K-ETS, the operational objectives of Phase II ('18–'20) emphasized increasing the reduction in GHG emissions and gradually improving the K-ETS. The government prepared the Master Plan for the Emissions Trading System for Phase II (Jan. '17), which established the basic direction for the K-ETS during Phase II, and the Allocation Plan for Phase II: Step 1 ('18–'20) (Dec. '17), which contained details of the regulations for the K-ETS, including those related to the cap. In the following year, an amendment to the Basic Roadmap for Achieving 2030 National GHG Reduction Targets (Jul. '18) (hereafter "the amended Roadmap") was completed, the purpose of which was to reflect the new government's environmental and energy policies. The amended Roadmap was reflected in the Allocation Plan for Phase II: Step 2 ('18–'20) (Jul. '18), which added further detail to the standards, such as total emissions allowances (1,796.1 Mt), standards for auctions, and benchmark-based allocations. However, despite many liable entities holding a substantial amount of surplus emission permits, an imbalance in the supply and demand for emission permits arose because these surplus emission permits were not traded for a number of reasons, including permitting the banking of surplus emission permits within a phase without restriction. As a result, the Allocation Plan for Phase II: Step 2 was amended (Jun. '19) to newly introduce criteria for the banking of emission permits across compliance years within a phase. In addition, the government made efforts to improve K-ETS by amending guidelines for the monitoring, reporting,

and verification of emissions and guidelines for emissions trading.

Phase III ('21–'25) focuses on strengthening the effectiveness of the K-ETS, with an aim of successfully meeting the national GHG reduction targets. The government prepared the Master Plan for the Emissions Trading System for Phase III (Dec. '19), which established strategies to further develop allocation methods, substantially reduce GHG emissions, and expand market functions. In addition, the Allocation Plan for Phase III ('21–'25) (Sep. '20), which contained detailed standards, such as total emissions allowances (3,082.3 Mt), standards for free allocations and auctions, and benchmark-based allocations. In 2020, the Act and the Enforcement Decree were amended to reinforce the basis for implementing the K-ETS during Phase III.

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

<table>
<tr><th colspan="2">Division</th><th colspan="3">Phase II ('18–'20)</th><th>Phase III ('21–'25)</th></tr>
<tr><td rowspan="2">National Policies for GHG Reductions</td><td>National GHG Reduction Target</td><td colspan="3">• Establishment of a plan to reduce GHG emissions by 37% from business-as-usual (BAU) levels in 2030 (Jun. '15)</td><td>• Reduction by 24.4% of the total GHG emissions in '17 (Dec. '19)</td></tr>
<tr><td>Implementation Plan for Sectoral Reductions</td><td>• Basic Roadmap for Achieving 2030 National GHG Reduction Targets (Dec. '16)</td><td colspan="3">• Amendment to the Basic Roadmap for Achieving 2030 National GHG Reduction Targets (Jul. '18)</td></tr>
<tr><td rowspan="2">Emissions Trading System</td><td>Master Plan</td><td colspan="3">• Master Plan for the Emissions Trading System for Phase II (Jan. '17)</td><td>• Master Plan for the Emissions Trading System for Phase III (Dec. '19)</td></tr>
<tr><td>Allocation Plan</td><td>• Allocation Plan for Phase II: Step 1 ('18 –'20) (Dec. '17)[1)]</td><td>• Allocation Plan for Phase II: Step 2 ('18–'20) (Jul. '18)[2)]</td><td>• Allocation Plan for Phase II: Step 2 ('18–'20) amended (Jun. '19)[3)]</td><td>• Allocation Plan for Phase III ('21–'25) (Sep. '20)[4)]</td></tr>
</table>

1) Details on the allocation for Phase II and the cap (538.5 Mt) and reserve (14.0 Mt) for the first compliance year ('18) 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 environmental and energy policies, including the amended Roadmap ('18). It was also decided that the amount of emissions allowances for '18 (Allocation Plan for Phase II: Step 1) would be maintained even after the amount of emissions allowances for the Action Plan for Phase II: Step 2 was determined, and the amount of emissions allowances for '19 would be adjusted if that for '18 increased or decreased.
2) Details for Phase II such as the cap (1,777.1 Mt), total emissions allowances (1,796.1 Mt), and standards for auctions and benchmark-based allocation were added and specified.
3) Standards for allowing the banking of emission permits across compliance years within Phase II were revised.
4) Details on the allocations, the cap (3,048 Mt) and reserve (34.0 Mt) for Phase III were specified.

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

Division	Guidelines
Allocation/ Revocation	• Guidelines for the Allocation, Allocation Adjustment, and Allocation Revocation of GHG Emission Permits (Ministry of Environment, partially amended in Jul. '18)
Reporting/Certification	• Guidelines for the Reporting and Certification of Emissions under the GHG Emissions Trading System (Ministry of Environment, partially amended in Jan. '20)
Verification	• Guidelines for the Verification of the Operations of the GHG Emissions Trading System (Ministry of Environment, partially amended in May '18)
Emissions Trading	• Regulations for the Additional Allocation of Emission Permits for Auctions and Market Stabilization Measures (Ministry of Environment, partially amended in May '20) • Notification on GHG Emissions Trading (Ministry of Environment, partially amended in May '18) • Notification on Application Qualifications and Evaluation Standards for the Emissions Exchange (Ministry of Environment, partially amended in May '18) • Notification on the Supervision of the Emissions Exchange (Ministry of Environment, partially amended in May '18) • Notification on the Designation and Operations of Market Makers within the Emissions Trading Market (Ministry of Environment, Jan. '19) • Notification on the Date of Designation of Market Makers in the First Compliance Year (Ministry of Environment, Mar. '19) • Notification on the Designation of Market Makers for the Emissions Trading Market in 2019 (Ministry of Environment, May '19)
Offset Mechanisms	• Guidelines for the Feasibility Assessment of External Offset Projects and the Certification of Reductions (Ministry of Environment, partially amended in Jun. '18)

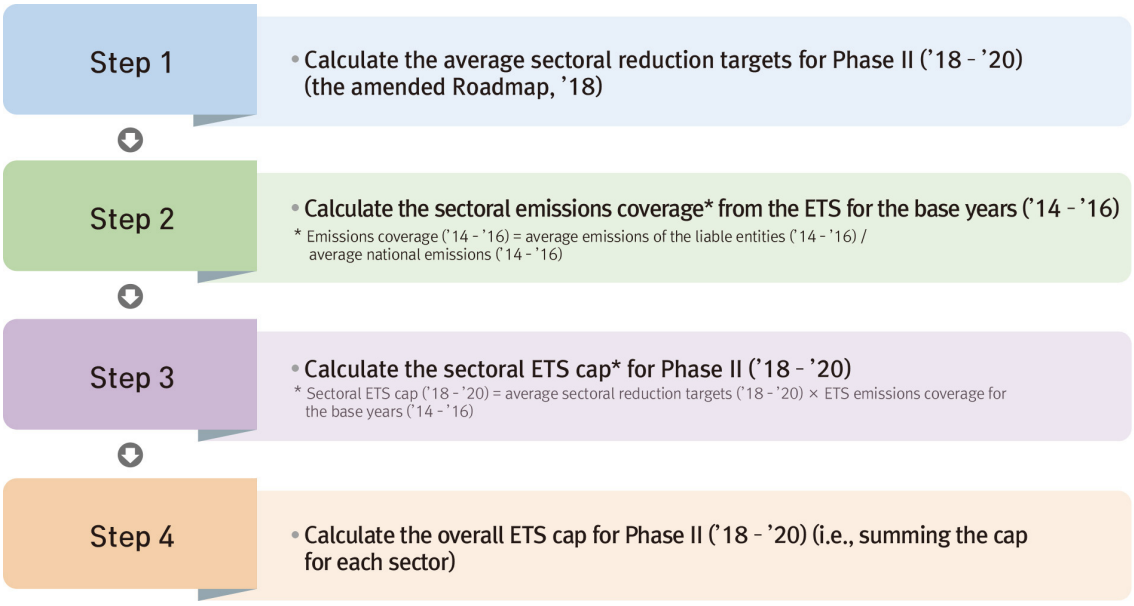
2. Cap and Total Emissions Allowances

The cap is the total amount of GHG emissions all liable entities as a group 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 national GHG reduction targets and the Basic Roadmap for achieving these national reduction targets as provided under Article 5(1) of the Act. The cap for Phase II was set by first isolating the estimated emissions from those sectors covered by the K-ETS from the national reduction targets reflecting the national growth prospects and reduction capacity for '18–'20. The proportion of emissions produced by liable entities from the national emissions during the base years ('14–'16) was then reflected in those isolated emissions.

The cap for Phase II was calculated for six main sectors (industry, power, buildings, transport, waste, and public services/other sectors) in order to ensure consistency between the K-ETS and the National Roadmap. However, for some emission activities,

separate allowances for sub-sectors were set after comprehensively reassessing the categorization[1]. Furthermore, the sectors were subdivided[2] into sub-sectors for the auctioning of emission permits, which was introduced from Phase II.

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



Total emissions allowances consist of the cap and an additional reserve established separately from the cap, which is the total amount of emission permits allocated or held by the government during a phase. 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 separate reserve for market stabilization measures and market making (19.0 Mt).

Of the total emissions allowances, the reserve is not subject to pre-allocation and is retained by the government. The reserve is 153.2 Mt, which consists of 14.0 Mt for market stabilization measures, 5.0 Mt for market making, and 134.1 Mt for other purposes[3] (power 78.3 Mt[4] and other than power 55.8 Mt). The reserve for other

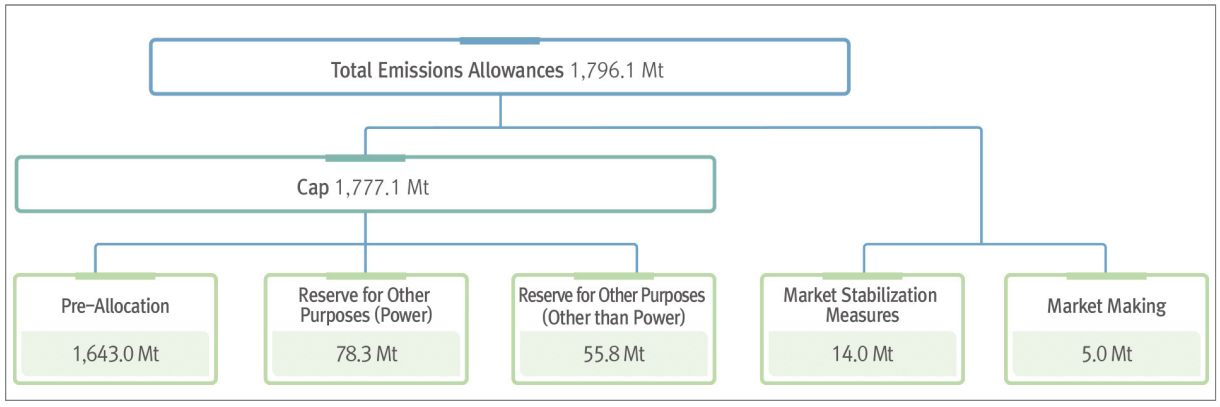
1) In this, factors such as the scale of emissions for a relevant emission activity, differences in emission characteristics or reduction capacities between sub-sectors, the proportion of a relevant activity's emissions in comparison to total emissions for a relevant entity, and the possibility of categorization in emissions reports were considered.

2) The classification of sub-sectors eligible for auctions was inappropriate for calculating the allowances for each sub-sector because there were many cases of a sub-sector containing only one entity.

3) 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 those that are non-power-related, representing 10.5% and 5.5% of the cap for a relevant sector, respectively.

purposes was 110.4 Mt higher than for Phase I (23.7 Mt). This was partly the result of a change to the allocation of emission permits for the establishment and expansion of facilities expected from Phase II, which allowed this purpose to be classified as a form of additional allocation rather than pre-allocation.

〈Figure Ⅰ-2〉 Cap and Total Emissions Allowances for Phase II



4) This is calculated based on factors such as the allocation for new entrants, additional allocation and allocation revocation of emission permits in Phase I, and the 8th Plan on Electricity Demand and Supply.

K-ETS Operational Results

Ⅱ. K-ETS Operational Results

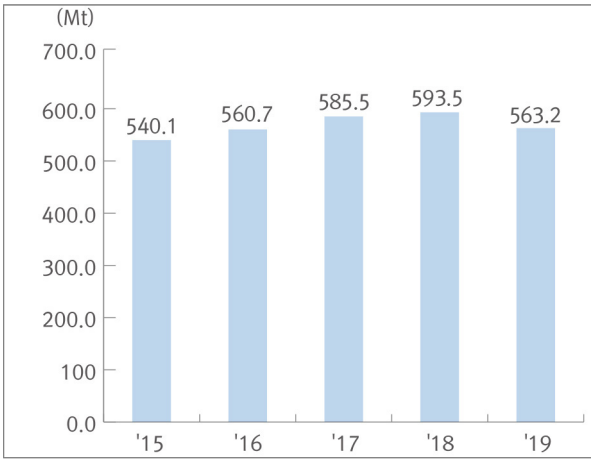
1. Allocation of Emission Permits

When business entities designated as liable entities submit their allocation application to the competent authority four months prior to the commencement of a phase, the authority issues a notification of the allocated amount, which is referred to as the pre-allocation amount.[5] In Phase I, the entire allocation for the emission permits for liable entities was distributed free-of-charge. However, because auctions were introduced in Phase II, meaning that a number of liable entities were now in sub-sectors subject to auctions, 3% of the allocated amount was deducted from the pre-allocation and set aside for purchase by liable entities through auctions in the emissions trading market when deemed necessary.

In the '19 compliance year, the amount of emission permits set for pre-allocation was 521.2 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 563.2 Mt (610 entities). Unlike the yearly increase in the final allocation amount observed in '16 and '17 during Phase I compared to previous years (3.8% and 4.4%, respectively), the final allocation amount in '19 decreased by 5.1% compared to '18 during Phase II. This was the result of a change made to the cap upon the application of the amended Roadmap (Jul. '18) to the Allocation Plan for Phase II (Jul. '18) and the adjustment in the allocation caused by mergers, splits, or the entry of additional liable entities.

5) The pre-allocation amount specified in Chapter I of this report is the amount set for allocation during each compliance year, and the pre-allocation amount specified in Chapter II is the amount that the liable entities are notified of by the competent authority in response to their allocation application (the pre-allocation amount in this chapter refers to the amount pre-allocated for free, with the amount for auctions transferred to a separate account).

〈Figure Ⅱ-1〉 Yearly Final Allocation



〈Table Ⅱ-1〉 Yearly Final Allocation

(Unit: Mt, entities)

Phase	Year	Final Allocation	Annual Rate of Change	No. of Entities
Phase I	'15	540.1	-	522
	'16	560.7	3.8%	564
	'17	585.5	4.4%	592
Phase II	'18	593.5	1.4%	587
	'19	563.2	-5.1%	610

Source: Emissions Trading Registry System (ETRS) Database (as of Oct. '20)

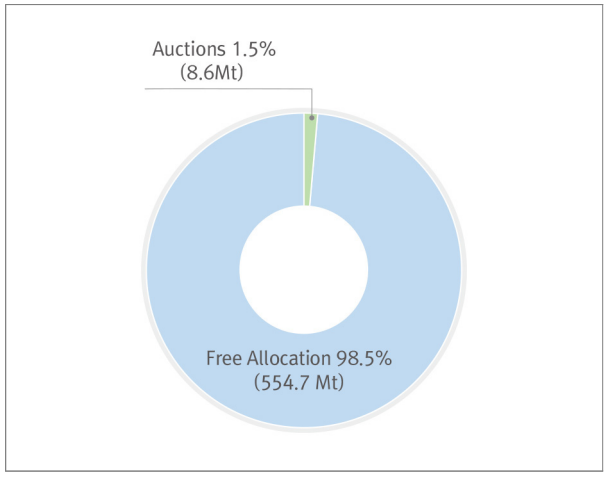
The final allocation amount consists of free allocation and auctioned allowances. In '19, the allowances set for free allocation totaled 554.7 Mt (98.5%), while auctioned allowances accounted for 8.6 Mt (1.5%), which indicates that most of the allowances were freely allocated.

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 business entity's previous emissions in comparison to its activity data, such as its product output, taking into consideration the efficiency of their 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], integrated energy supply [industrial], waste, and the three sub-sectors from Phase I).

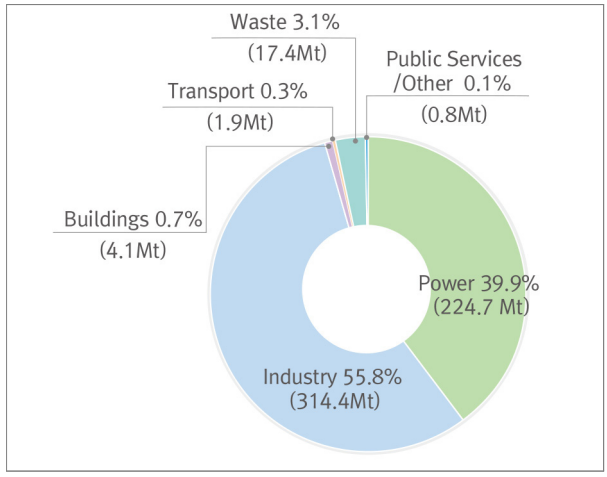
For the compliance year of '19, 521.2 Mt of allowances was originally allocated to 570 business entities, but the number of entities increased because some entities took over the rights and obligations of other liable entities (caused by, for example, the splitting of them), while 16 liable entities were newly designated (2.3 Mt). As a result, the number of liable entities subject to the final allocation increased by 40 from 570 to 610. Broken down by sector, the final allocation was 314.4 Mt for industry (55.8%),

224.7 Mt for power (39.9%), 17.4 Mt for waste (3.1%), 4.1 Mt for buildings (0.7%), 1.9 Mt for transport (0.3%), and 0.8 Mt for public services and other sectors (0.1%). The difference between the final allocation and pre-allocation amount was higher for public services/ other sectors, waste, and buildings (19.9%, 9.1%, and 8.9%, respectively) than for the other sectors (8.3% for industry, 7.7% for power, and −1.8% for transport).

〈Figure Ⅱ-2〉 '19 Free Allocation and Auctions



〈Figure Ⅱ-3〉 '19 Final Allocation by Sector



〈Table Ⅱ-2〉 Final Allocation by Sector for the First Compliance Year ('18) of Phase II

(Unit: Mt)

Sector	Final Allocation (E=C+D)	Free Allocation (C=A+B)		Allocation Changes (B)[1]						Auctions (D)	Rate of Change (E-A)/A
			Pre-Allocation (A)		New Entry	Additional Allocation	Allocation Revocation	Succession of Rights and Obligations			
								Transfer	Acquisition		
Industry	304.7	304.7	297.4	7.3	-	9.5	2.2	6.4	6.4	0.004	2.5%
Power	264.6	260.0	247.4	12.6	-	15.5	3.0	0.001	0.001	4.6	6.9%
Buildings	4.1	4.1	4.0	0.1	-	0.2	0.1	-	-	0.05	2.6%
Transport	2.1	2.1	2.0	0.05	-	0.1	0.02	-	-	-	2.2%
Waste	17.3	17.3	16.0	1.3	-	1.6	0.3	-	-	-	8.3%
Public Services/Other	0.7	0.7	0.7	0.01	-	0.01	0.002	-	-	-	1.4%
Total	593.5	588.9	567.5	21.4	-	27.0	5.6	6.4	6.4	4.6	4.6%
No. of Liable Entities	587[2]	587	591		-	242	224	17	19	12	-0.7%

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) Allowances were pre-allocated to 591 entities, but the number of liable entities at the time of the final allocation decreased to 587 because the allocation to four entities was transferred or withdrawn due to changes (e.g. allocation revocation, succession of rights and obligations, etc.) that occurred during the compliance year.

〈Table Ⅱ-3〉 Final Allocation by Sector for the Second Compliance Year ('19) of Phase II

(Unit: Mt)

Sector	Final Allocation (E=C+D)	Free Allocation (C=A+B)	Pre-Allocation (A)	Allocation Changes (B)[1]	New Entry	Additional Allocation	Allocation Revocation	Succession of Rights and Obligations		Auctions (D)	Rate of Change (E-A)/A
								Transfer	Acquisition		
Industry	314.4	314.3	290.2	24.1	2.1	13.4	5.0	5.1	18.7	0.1	8.3%
Power	224.7	216.3	208.6	7.7	-	17.6	3.2	7.3	0.7	8.3	7.7%
Buildings	4.1	4.1	3.8	0.3	0.2	0.3	0.2	0.0004	0.1	0.02	8.9%
Transport	1.9	1.9	1.9	-0.03	-	0.2	0.2	-	-	-	-1.8%
Waste	17.4	17.4	16.0	1.5	0.1	1.7	0.3	-	-	-	9.1%
Public Services/Other	0.8	0.6	0.6	-0.001	-	0.0001	0.001	-	-	0.1	19.9%
Total	563.2	554.7	521.2	33.5	2.3	33.2	9.0	12.5	19.5	8.6	8.1%
No. of Liable Entities	610[2]	610	570		16	266	248	21	45	18	7.0%

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) Allowances were pre-allocated to 570 entities, but the number of liable entities at the time of the final allocation increased to 610 due to changes (e.g., allocation revocation, succession of rights and obligations, etc.) and new entrants (16 entities) that occurred during the compliance year.

※ The number of entities for each item only indicates the number of entities falling under the relevant item, but there were differences in the overall number of entities due to changes (e.g., the succession of rights and obligations, etc.) that occurred during the compliance year.

Source: Emissions Trading Registry System (ETRS) Database (as of Oct. '20)

According to 〈Table II-2〉 and 〈Table II-3〉, unlike '18, the number of liable entities at the time of the final allocation was higher than during pre-allocation in '19.[6] This was the result of changes made to the amount of allocated emission permits, which were the result of the entry of new liable entities and the succession of rights and obligations between liable entities. In '18, the amount of allocated allowances transferred and acquired as a result of the succession of rights and obligations was 6.4 Mt (involving 17 and 19 entities, respectively). In '19, the amount transferred was 12.5 Mt (21 entities) and that acquired was 19.5 Mt (45 entities), which was approximately twice as high compared to '18. The succession of rights and obligations occurs due to splits, mergers and acquisitions of business entities, and transfer and lease of facilities. It is believed that these changes to liable entities that led to the designation of new liable entities led to the increase in the number of entities in '19.

6) In '18, the number of liable entities that received emissions allowances was 591 at the time of pre-allocation but decreased to 587 at the time of the final allocation. In '19, the number of liable entities that received emissions allowances was 570 at the time of pre-allocation but increased to 610 at the time of the final allocation.

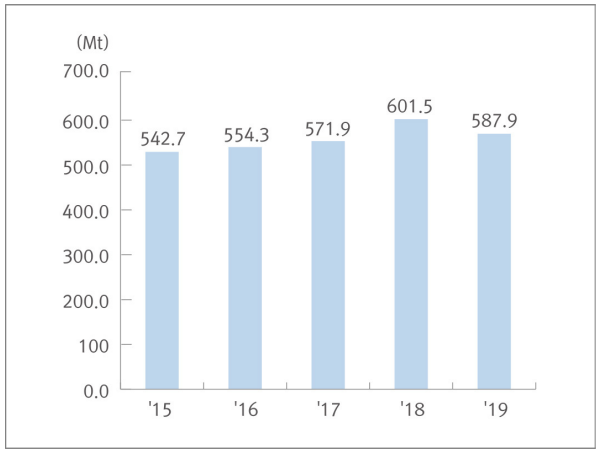
The Act (which came into force on 1 Jun. '20) and the Enforcement Decree (which came into force on 18 Aug. '20) were amended for the operation of the K-ETS during Phase III. However, pursuant to Supplementary Provisions Article 3 of the Act and Supplementary Provisions Article 6 of the Enforcement Decree, the pre-amendment provisions are applied to the additional allocation and allocation revocation of the emission permits and to interim measures for allocation standards.

2. Certification and Surrender of Emission Permits

1) Certification of Emissions

A liable entity must report to the competent authority by submitting an emissions report specifying its GHG emissions in a measurable, reportable, and verifiable manner within three months from the date of completion of each compliance year. The competent authority must then evaluate the validity of the details specified in the report and certify the actual amount of GHG emissions produced by the liable entity. In 2020, the entire K-ETS schedule was revised due to the coronavirus disease pandemic (hereafter "COVID-19"), and thus the submission of emissions reports and notification of the certified emissions were delayed by one month each. For the '19 compliance year, the certified emissions amounted to 587.9 Mt (610 entities), which was 2.3% (13.6 Mt) lower than the previous year, the first reduction compared to the previous year since '16.

〈Figure Ⅱ-4〉 Certified Emissions by Year



〈Table Ⅱ-4〉 Certified Emissions by Year

(Unit: Mt, entities)

Phase	Year	Certified Emissions	Annual Rate of Change	No. of Entities
Phase Ⅰ	'15	542.7	-	522
	'16	554.3	2.2%	560
	'17	571.9	3.2%	591
Phase Ⅱ	'18	601.5	5.2%	586
	'19	587.9	-2.3%	610

Source: Emissions Trading Registry System (ETRS) Database (as of Oct. '20)

〈Table Ⅱ-5〉 '19 Surrender Results by Sector

(Unit: Mt, entities)

Division	Certified		Carried over from the Previous Compliance Year	KCU Conversion	Traded				Surrendered					Not Surrendered[2]	Not Banked[3]	Carried over to the Next Compliance Year		
	No. of Entities	Certified Emissions			KAUs Sold	KAUs Purchased[1]	KCUs Sold	KCUs Purchased	Amount Surrendered (A+B)	KAUs (A)			KCUs (B)			Amount Banked (C+D)	KAUs Banked (C)	KCUs Banked (D)
										Allocated	Borrowed	Surrendered in Excess						
Industry	462	318.0	19.9	0.1	14.1	8.1	-	-	318.0	312.8	5.1	-	0.1	0.03	0.01	10.9	10.9	0.003
Power	33	245.4	13.4	0.1	11.5	19.9	-	-	245.4	241.7	3.6	-	0.1	-	-	4.5	4.5	-
Buildings	35	4.3	0.6	0.01	0.2	0.1	-	-	4.3	4.3	0.02	-	0.01	-	-	0.3	0.3	-
Transport	7	1.9	0.2	-	0.1	0.005	-	-	1.9	1.8	0.02	-	-	-	-	0.2	0.2	-
Waste	71	17.4	1.5	0.04	0.9	0.8	-	-	17.4	17.2	0.2	-	0.04	-	0.000001	1.4	1.4	-
Public Services/ Other	2	0.8	-	0.01	0.01	0.1	-	-	0.8	0.8	-	-	0.01	-	-	0.01	0.01	-
Market Makers[4]	2	-	-	-	2.3	0.1	-	-	-	-	-	-	-	-	-	-	-	-
Total	610	587.9	35.6	0.3	29.1	29.3	-	-	587.8	578.6	8.9	-	0.3	0.03	0.01	17.2	17.2	0.003
No. of Entities	610	610	406	8	253	203	-	-	609	609	131	-	9	1	5	437	437	1

1) The difference between the amount sold and purchased resulting from the conversion of the transferring entity's trading volume into the acquiring entity's final allocation amount following the succession of rights and obligations.

2) The sum of the emission permits of liable entities that had failed to meet their obligation to surrender for each compliance year.

3) Surplus emission permits not carried over to the next compliance year by liable entities after meeting their obligation to surrender expired automatically. The amount of surplus emissions (0.01 Mt) from four entities is the amount remaining after the emission permits were carried over to the next compliance year to the fullest possible extent.

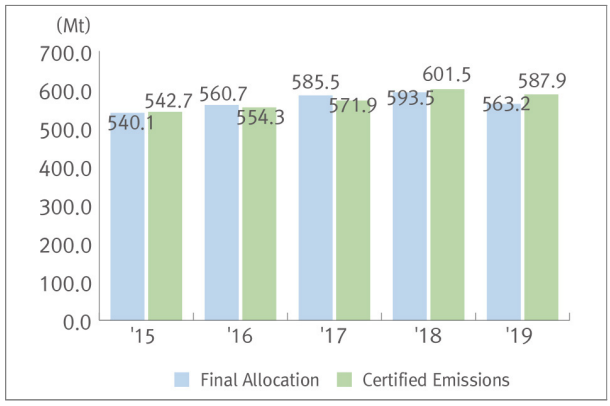
4) To ensure the liquidity of the emissions trading market, a market maker such as a public financial institution suggests ask and bid prices of emission permits and participates in transactions (a market maker is not a liable entity).

※ The number of entities for each item only indicates the number of entities falling under the relevant item, but there are differences in the overall number of entities due to changes (e.g., the succession of rights and obligations, etc.) occurring during the compliance year.

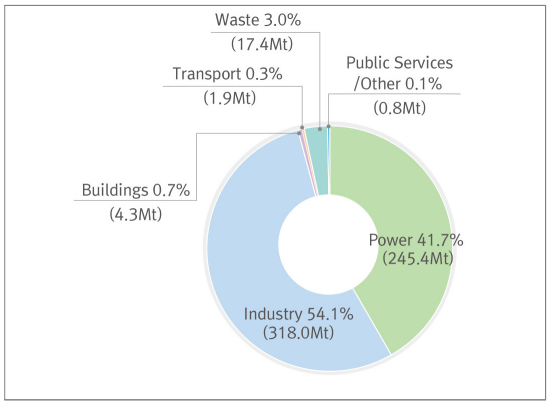
Source: Emissions Trading Registry System (ETRS) Database (as of Oct. '20)

The difference between the final allocation amount and the amount of certified emissions for '19 was 24.6 Mt. The amount of certified emissions exceeded the final allocation amount. Broken down by sector, the emissions from the industry sector were 318.0 Mt (54.1%), compared to 245.4 Mt (41.7%) for the power sector, 17.4 Mt (3.0%) for waste, 4.3 Mt (0.7%) for buildings, 1.9 Mt (0.3%) for transport, and 0.8 Mt (0.1%) for public services and other sectors.

〈Figure Ⅱ-5〉 Final Allocation and Certified Emissions by Year



〈Figure Ⅱ-6〉 '19 Certified Emissions by Sector



2) Surrender of Emission Permits

Liable entities must surrender their emission permits in an amount equivalent to the amount of their certified emissions to the competent authority within six months from the date of completion of each compliance year. In 2020, the submission of emission permits by liable entities was delayed because the notification of certified emissions was delayed by one month. 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).

The banking and borrowing of emission permits and the use of KCUs obtained through external offset projects were introduced as mechanisms to ensure flexibility in achieving the reduction targets of liable entities and the surrendering of emission permits. In addition, additional emission permits may be obtained through the market-making system[7] for the management of market price and liquidity.

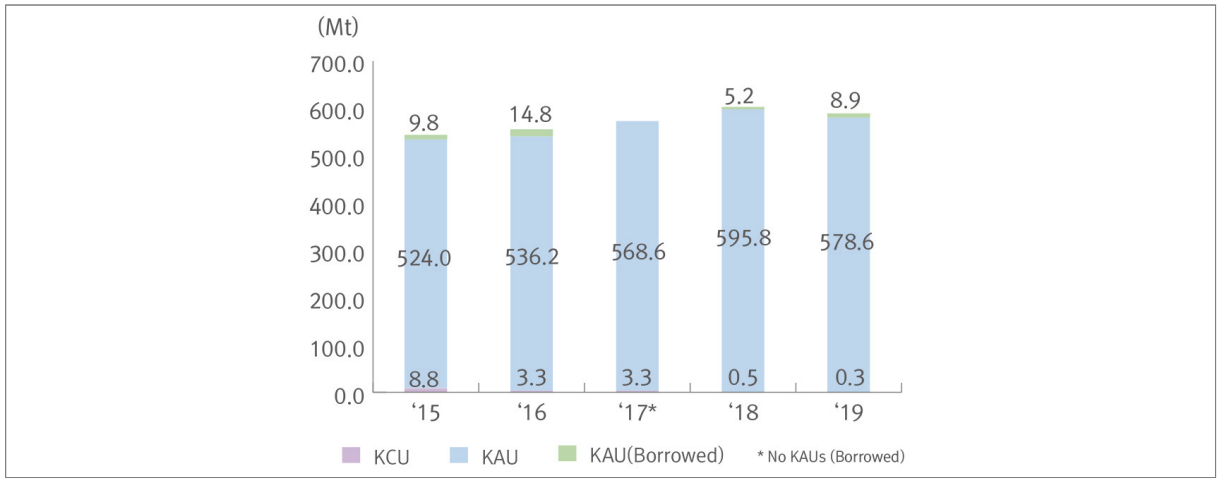
Had all liable entities fulfilled their obligation to surrender their emission permits, the amount of emission permits surrendered in '19 would have been 587.9 Mt, which is the amount of certified emissions. However, one entity (0.03 Mt) failed to fulfill its obligation to surrender its emission permits, and thus the amount surrendered was 587.8 Mt.

7) This is the system under which market makers such as public final institutions are required to suggest ask and bid prices of emission permits and participate in emission permit transactions in order to revitalize the emissions trading market.

Broken down by type of emission permit surrendered in '19, KAUs accounted for 587.6 Mt (99.95%, 609 entities) and KCUs for 0.3 Mt (0.05%, 9 entities), which indicates that most of the emission permits surrendered were KAUs. The surrender rate for KCUs was nine times lower compared to that during Phase I (0.9%). In addition, 35.6 Mt (406 entities) of the emission permits banked from the previous year ('18) was used in the trading and surrendering of emission permits, and 8.9 Mt (131 entities) of the emission permits borrowed from the following year ('20) was used in the surrendering of emission permits. After the completion of the surrendering of the emission permits, the remaining 17.2 Mt (437 entities) was carried over for the following compliance year.

Penalties will be imposed on the entity that failed to fulfill its obligation to surrender its emission permits (Article 33 of the Act), and surplus emission permits of five entities (10,000 t)[8] expired.

〈Figure II-7〉 Surrendered Emission Permits by Year



A. Emissions Trading

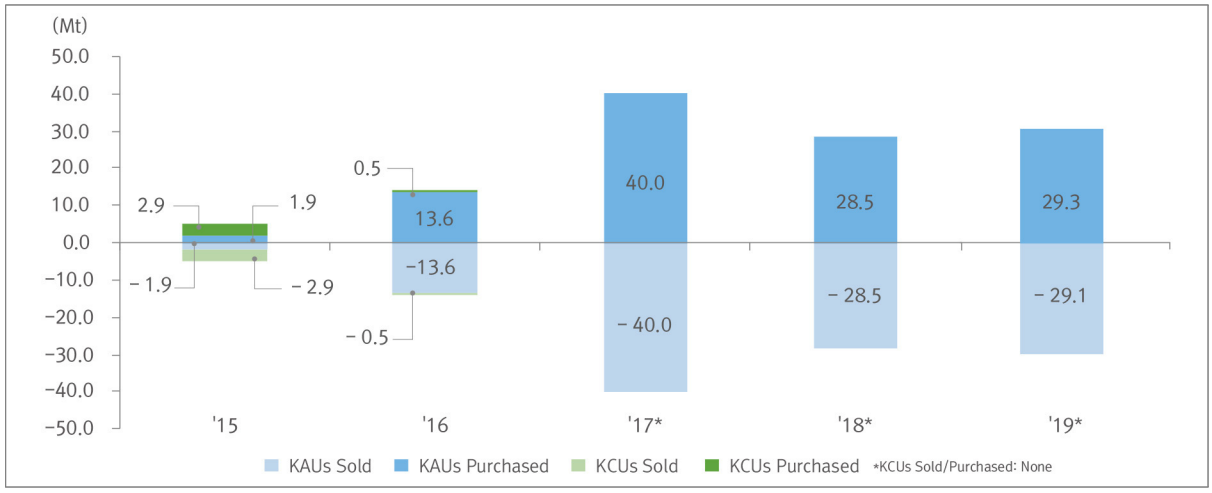
Emission permits can be traded throughout the exchange and over-the-counter transactions. The tradable permits are KAUs, KCUs, and KOCs. Unlike over-the-counter trading, where there are generally no restrictions on tradable permits and the transaction period, different transaction periods are applied to each permit in

8) The amount of emission permits not carried over to the next compliance year by liable 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.

exchange trades because some restrictions are imposed, such as in cases where trading begins through listing.[9] Only the results of the over-the-counter and exchange trades of KAU19 and KCU19[10] are discussed here because a detailed analysis of the emission permits for '19 is provided in Chapter III.

Of the total amount of KAU19 surrendered to the government in 2020 (587.6 Mt), 29.1 Mt was generated through selling and 29.3Mt[11] through purchasing, which accounted for 5.0% of the total emission permits surrendered. The trading volume of KAU19 was 2.6% higher than the trading volume of KAU18 (28.5 Mt). The total amount of KCU19 surrendered in 2020 (0.3 Mt) does not include the amount generated through trading, as there had been no KCU transactions undertaken since the '17 compliance year.

〈Figure Ⅱ-8〉 Trading Volume of KAUs and KCUs by Year



Broken down by sector, 14.1 Mt (48.5%) of KAU19 was sold by the industry sector, 11.5 Mt (39.5%) by power, 2.3 Mt (7.7%) by market makers, 0.9 Mt (3.3%) by waste, 0.2 Mt (0.6%) by buildings, and 0.1 Mt (0.4%) by transport. In addition, 19.9 Mt (68.1%) of KAU19 was purchased by the power sector, 8.1 Mt (27.7%) by industry, 0.8 Mt (2.8%) by waste, 0.1 Mt (0.5%) by buildings, 0.1 Mt (0.5%) by public services/other sectors, and

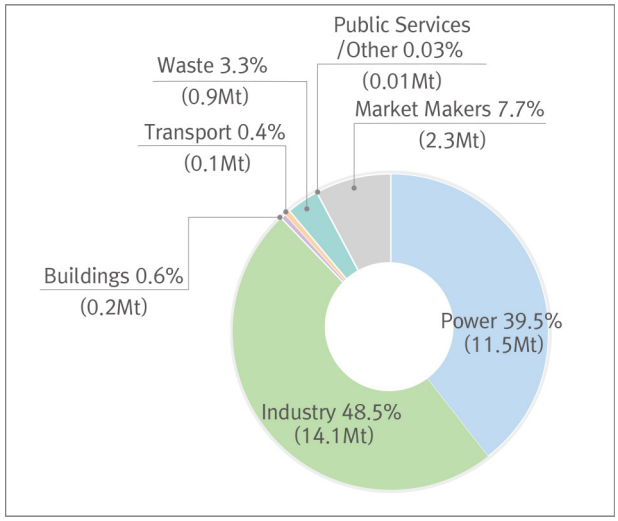
9) In accordance with Article 22 of the Act and Article 34 of the Enforcement Decree, the Korea Exchange was designated as an emission permit exchange (Jan. '14) and has been in operation since the introduction and implementation of the K-ETS (since Jan. '15). KAU19 was traded between 7 Nov. '18 and 11 Sep. '20, and KCU19 was traded between 16 Sep. '19 and 11 Sep. '20.

10) KOCs are also tradable but were excluded from the analysis because they are not eligible for surrender.

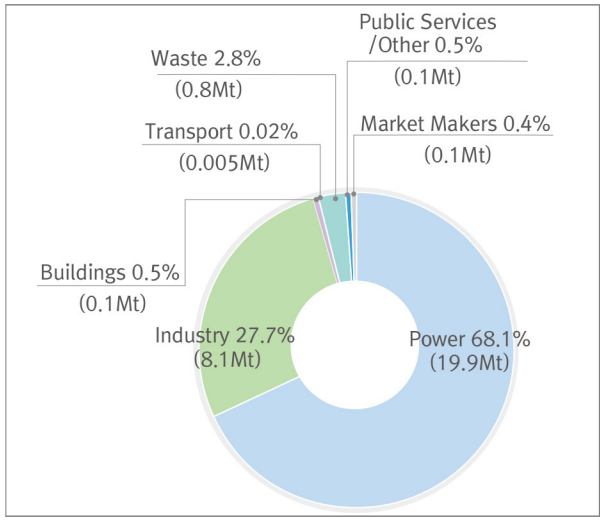
11) The difference between the amount sold and purchased resulting from the conversion of the transferring entity's trading volume into the acquiring entity's final allocation amount following the succession of rights and obligations.

0.1 Mt (0.4%) by market makers. In the power sector, the amount of KAU19 purchased (68.1%) exceeded the amount of KAU19 sold (39.5%). In the industry sector, the amount of KAU19 sold (48.5%) exceeded the amount of KAU19 purchased (27.7%). In addition, the participation of market makers as part of a new policy introduced in the '18 compliance year during Phase II accounted for 7.7% of the sales of emission permits.

〈Figure Ⅱ-9〉 Amount of KAU19 Sold by Sector



〈Figure Ⅱ-10〉 Amount of KAU19 Purchased by Sector



The market-making system was introduced so that public financial institutions[12] designated as market makers are required to suggest ask and bid prices of emission permits and participate in emission permit transactions to revitalize the emissions trading market. Taking into consideration the operational results for Phase I, the reserve for market making was set at 5.0 Mt[13] and separated from the cap, which was the level considered necessary for the market makers to be able to contribute to this revitalization.[14]

Between Jun. '19 and Jul. '20, a total of 3.2 Mt of KAU19[15] was lent to market

12) To avoid market distortions, public financial institutions are allowed to provide market-making functions pursuant to Supplementary Provisions Article 3 of the Act and Article 2 of the Enforcement Decree (as of Nov. '20, the Korea Development Bank and the Industrial Bank of Korea are designated market makers).

13) This amount is about 30% of the trading volume of KAUs in the exchange market between 1 Jan. '15 and 31 Dec. '17.

14) Of the government reserves established in the Allocation Plan for Phase II: Step 2, the reserves for market stabilization measures (14.0 Mt) and market making (5.0 Mt) were not included in the cap in order to ensure stable trading prices for emission permits and the liquidity of the emissions trading market.

15) To revitalize emission trading and alleviate price volatility before settling KAU19 transactions, the lending amount was increased to 300 kt in both May and Jun. '20 and 400 kt in Jul. '20.

makers (100 kt each, a total of 200 kt, was lent every month), 2.3 Mt was sold, and 0.1 Mt was purchased. At the end of the lending period, 3.2 Mt was returned[16] in the form of emission permits (1.05 Mt) and in the form of cash (2.15 Mt).[17]

〈Table Ⅱ-6〉 Legal Grounds and Standards for the Market-Making System in Phase II

Division	Methods and Standards	Legal Grounds
Market Making	• Introduced as a measure to ensure the liquidity of the emissions trading market by obliging market makers designated by the competent authority to suggest ask and bid prices of emission permits and to participate in emission permit transactions • Market makers may rent all or part of the emission permits necessary for market making from the reserve for market making and must return them in the form of emission permits or equivalent cash at the end of the lending period • Market makers deliver monthly reports on the amount of emission permits retained and traded, ask and bid prices of emission permits, the number and volume of transactions undertaken at the ask and bid prices, the time of submission for the ask and bid prices, the price range between the ask and bid prices, etc.	Arts. 5(1) and 18 of the Act Art. 3(1)[1] of the Enforcement Decree Supplementary Provision Art. 3 of the Act Supplementary Provision Art. 2 of the Enforcement Decree[2]

1) The market-making system was introduced during Phase II in accordance with the Allocation Plan for Phase II and regulations for the reserves as provided in Articles 5(1) and 18 of the Act and Article 3(1) of the Enforcement Decree. Detailed standards and procedures are provided in the Notification on the Designation and Operations of Market Makers in the Emissions Trading Market (Ministry of Environment, '19)

2) Regulations for the Utilization of Public Financial Institutions as Market Makers to Ensure the Liquidity of the Emissions Trading Market

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 '18), Notification on the Designation and Operations of Market Makers in the Emissions Trading Market (Ministry of Environment, '19)

B. Flexibility Mechanisms

Flexibility mechanisms are the means to ensure flexibility in the surrendering of emission permits by offering liable entities various options other than trading so that they can achieve their GHG reduction targets and meet their obligation to surrender emission permits. These options include the use of KCUs obtained through external offset projects or the borrowing or banking of emission permits.

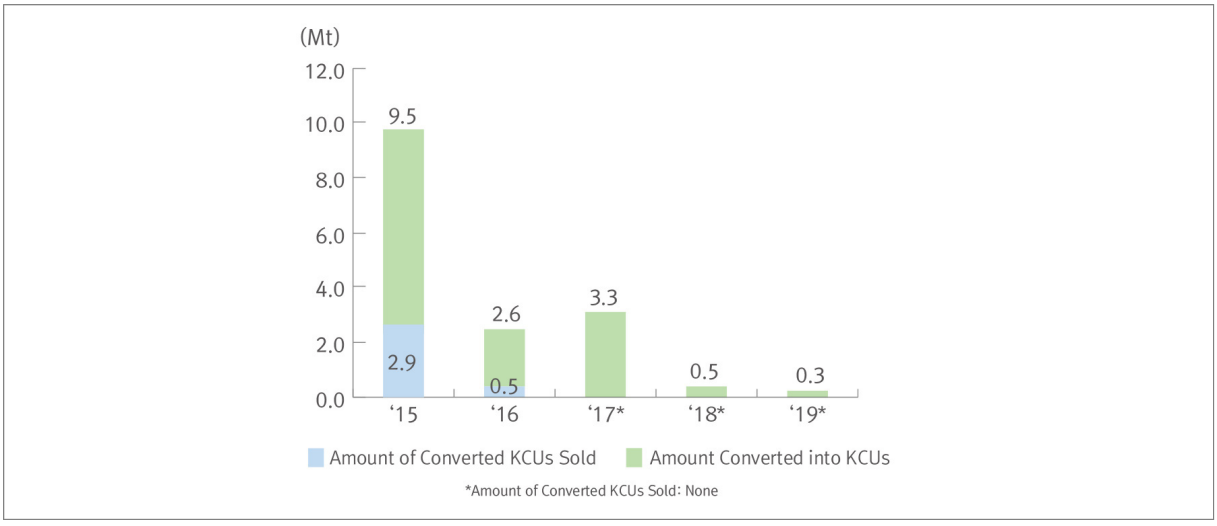
Regarding the use of KCUs, in the period between the introduction of the K-ETS

16) Emission permits lent to a market maker can be returned in the form of emission permits or cash after the end of the lending period. If returned in the form of emission permits, they are transferred from the market maker's account to the reserve account for market making.

17) Of the revenue generated from the selling of the reserves for market making, the transaction value of the emission permits, excluding the transaction fee for the financial institution, is returned to the government.

and the surrender of the emission permits for '19 in Phase II (1 Jan. '15 to 5 Nov. '20), external offset projects totaling 30.5 Mt[18] were approved and registered. Of this total, 15.4 Mt (9.5 Mt in '15, 2.6 Mt in '16, and 3.3 Mt in '17) in Phase I, 0.5 Mt in '18, and 0.3 Mt in '19 was converted into KCUs. The amount of KCUs in '19 was 47% lower than the previous year.[19] All of these KCUs were used in surrendering emission permits (9 entities), which accounted for 0.05% of all emission permits surrendered in '19. In addition, some of the KCUs banked from '18 were again carried over into '20 (2.9 kt).

〈Figure Ⅱ-11〉 KCUs Converted and Sold by Year



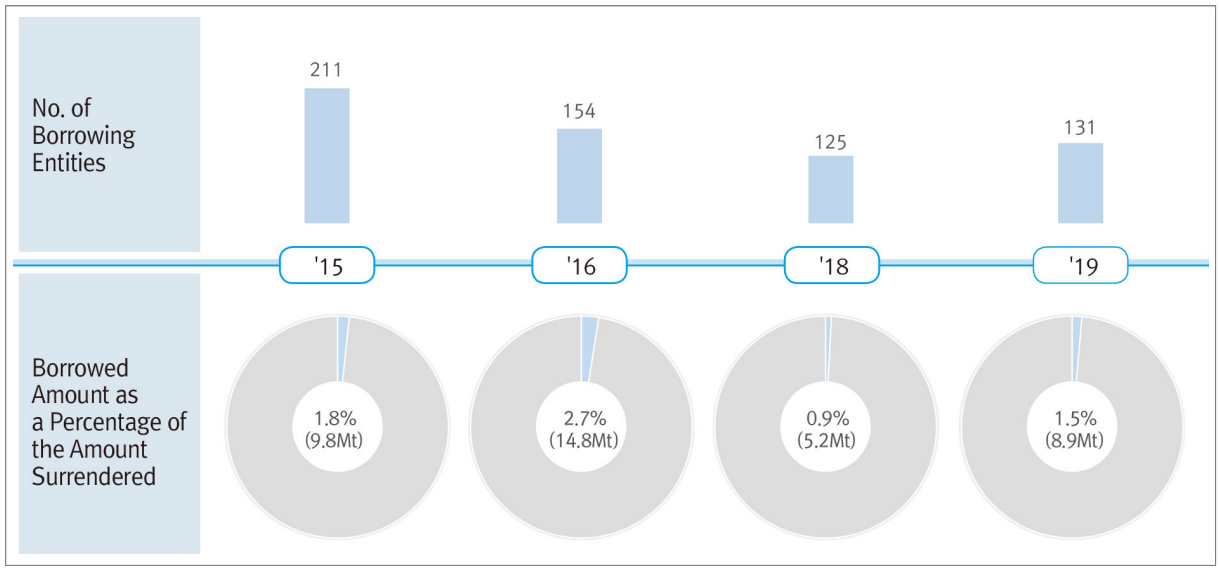
In terms of borrowing, 8.9 Mt (131 entities) of emission permits borrowed from '20 to '19 was surrendered, which accounted for 1.5% of the total amount of surrendered emission permits (587.8 Mt).

18) Offset credits for the period 1 Jan. '15–5 Nov. '20 (30.5 Mt) = 22.5 Mt (up until the completion of the surrender of emission permits for Phase I [1 Jan. '15–9 Aug. '18] + 8.0 Mt (up until the completion of the surrender of emission permits for the '19 compliance year during Phase II [10 Aug. '18–5 Nov. '20])

※ Of the 30.5 Mt from external offset projects, 30.2 Mt was obtained from CDM projects and 0.3 Mt was obtained from other external offset projects. During Phase II, there were no certified external offset project credits obtained by domestic companies from foreign CDM projects.

19) As of Nov. '20, 14.3 Mt of offset project credits had not been converted into KCUs.

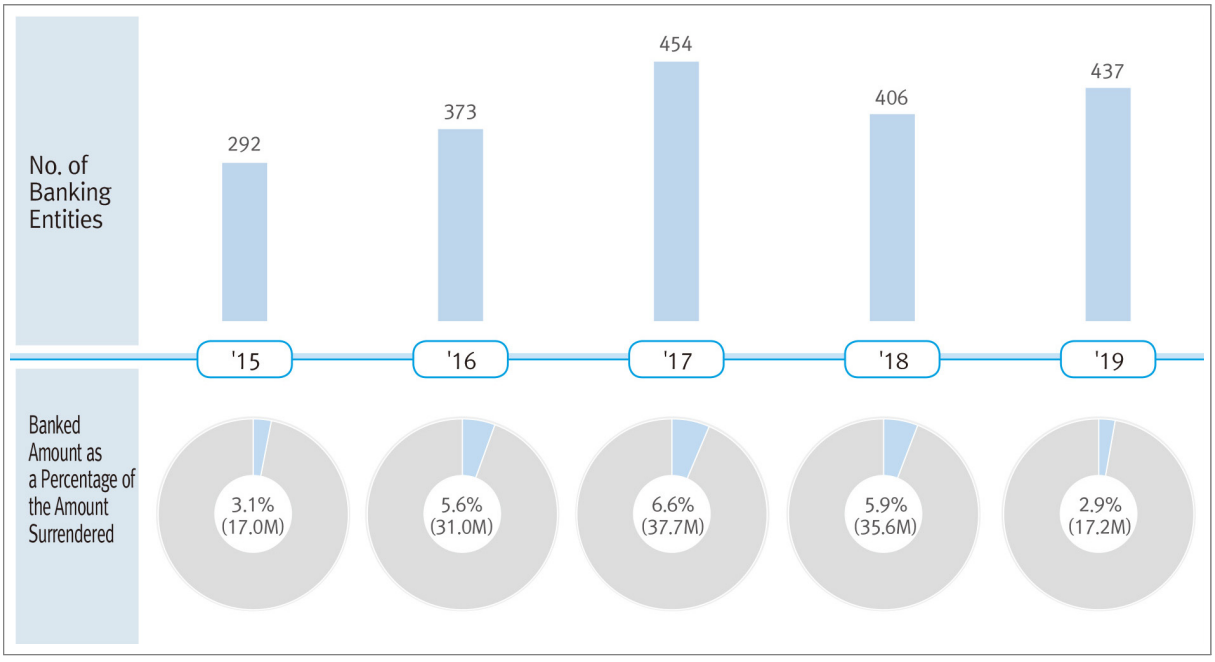
〈Figure Ⅱ-12〉 Amount Borrowed and Number of Borrowing Entities by Year



*In '17, Emission permits were not borrowed because borrowing from the subsequent phase was not allowed.

In terms of banking, 35.6 Mt (406 entities) of emission permits was carried over from '18 to '19, accounting for 6.0% of the total amount of surrendered emission permits (587.8 Mt) and greatly exceeding the amount of KCUs (0.3 Mt, 0.05%) and borrowed emission permits (8.9 Mt, 1.5%). After the completion of the surrender of emission permits for '19, 17.2 Mt (437 entities) of surplus emission permits was carried over to the next compliance year ('20), which accounted for 2.9% of the total amount of surrendered emission permits. This amount is similar to the '15 compliance year (17.0 Mt), but significantly lower than the compliance years '16, '17, and '18. (31.0 Mt, 37.7 Mt, and 35.6 Mt, respectively).

〈Figure Ⅱ-13〉 Amount Carried Over and the Number of Banking Entities by Year



Analysis of the Emissions Trading Market

Ⅲ. Analysis of the Emissions Trading Market

1. Trading Records for the Whole Market

1) Trading Volume and Price Trends[20]

The total volume of emissions trading in the exchange market and the over-the-counter market during the trading periods of Phases Ⅰ and the first and second compliance years in Phase Ⅱ (1 Jan. '15 to 11 Sep. '20)[21] is analyzed in this section[22].

The total trading volume was 163.9 Mt, consisting of 73.0 Mt (44.5%) in the exchange market and 90.9 Mt (55.5%) in the over-the-counter market. In terms of the types of emission permit, 136.8 Mt was traded as KAUs, 3.4 Mt as KCUs, and 23.7 Mt as KOCs, accounting for 83.5%, 2.1%, and 14.4%, respectively. The yearly trading volume from '15 to '20 (until the third quarter) was 5.7 Mt, 12.0 Mt, 26.3 Mt, 47.3 Mt, 38.0 Mt and 34.5 Mt, indicating that the trading volume in Phase Ⅰ increased by 111.3%, 119.4%, and 80.3% yearly, but it decreased by 19.6% and 9.3% each year from '19.

From '15 to the third quarter of '20, the average price of the emission permits per ton in the exchange market and the over-the-counter market continuously increased, from KRW 11,013 in '15 to KRW 17,056 in '16, KRW 20,951 in '17, KRW 22,122 in

20) Some of the statistics presented in Chapter Ⅲ of the present report are not consistent with those of the previous Phase Ⅰ ('15 to '17) K-ETS Report (GIR, Jan. '19) because the volume of emissions trading in the over-the-counter market was modified across the board from data with reference to the trading date on the trade reports submitted by the liable entities to the competent authorities (Article 25, Paragraph 1 of the Enforcement Decree) to data with reference to the transfer date when the emission permits transfer by the liable entities occurred (Article 21, Paragraphs 2 and 4 of the Act; Article 25, Paragraph 2 of the Enforcement Decree).

21) The analysis included the trading records for KAUs (KAU15~KAU20), KCUs (KCU15~ KCU19), and KOCs in the exchange market (real-time trading, block trading and auctions) and the over-the-counter market from 1 Jan. '15 to the end of the emissions trading in the second compliance year of Phase II (11 Sept. '20). However, detailed analysis of the trading records, trading volume, and price of each emission type was conducted using KAU19, KCU19, and KOC, which correspond to the second compliance year of Phase II. The trading price applied to the analysis was the weighted average calculated by the KRX for trading in the exchange market, and the actual trading price reported to and verified by the Ministry of Environment for trading in the over-the-counter market (In the absence of trading price information, the KRX closing price on the trading date was employed in the analysis).

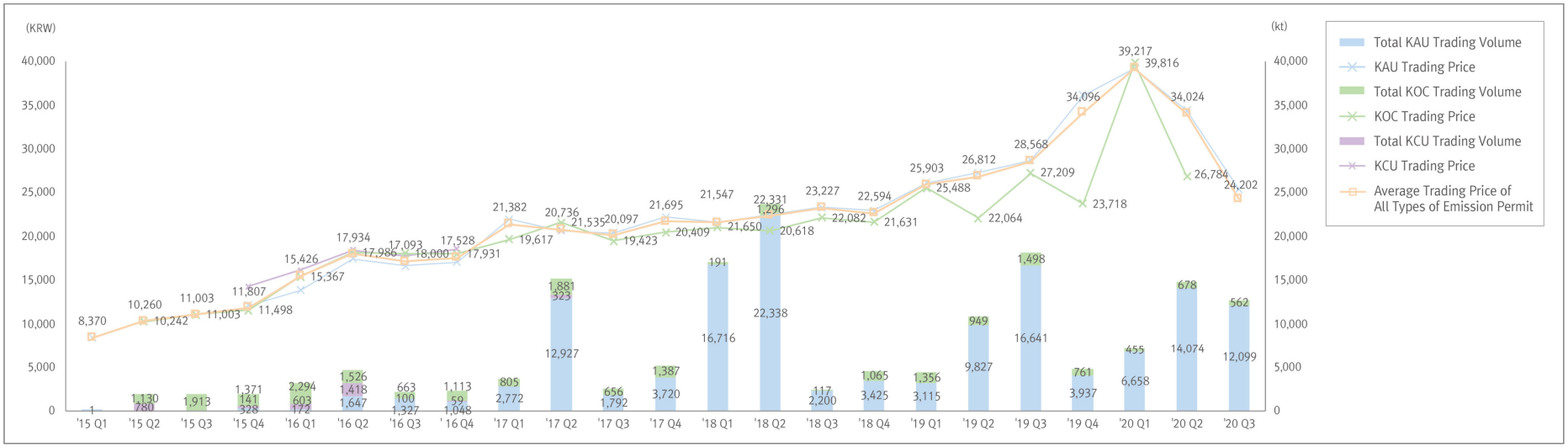
22) KAU15·KAU16·KAU17·KAU18·KAU19·KAU20, KCU15·KCU16·KCU17·KCU18·KCU19 and KOC. There is no record of actual trading of KCU17, 18, or 19. KCU20, which was not listed, was not included in the analysis.

'18, KRW 28,440 in '19, and KRW 31,492 in '20, an increase of 55.0%, 22.7%, 5.6%, 28.6%, and 10.7%, respectively. The overall average price during the trading period was KRW 24,624, with the average price of the KAUs being KRW 25,824, that of the KCUs being KRW 16,175, and that of the KOCs being KRW 18,903. The average price of KAUs was higher than that of other types of emission permit (KRW 9,650 higher than KCUs and KRW 6,921 higher than KOCs). With reference to the trading markets, the average price in the exchange market was KRW 25,160, which was higher than that of the over-the-counter market (KRW 24,192) by KRW 969.

The continuous increase in the price and trading volume led to an increase in the total payments, from KRW 62.4 billion in '15 to KRW 204.1 billion in '16, KRW 550.3 billion in '17, KRW 1,047.5 billion in '18, KRW 1,083.1 billion in '19, and KRW 1,087.3 billion in '20 (until the third quarter), an annual increase of 227.3%, 169.5%, 90.4%, 3.4% and 0.4% compared to the previous year, respectively. The total payments for the entire trading period were KRW 4,034.6 billion. Total payments for the KAUs were KRW 3,531.9 billion, compared to KRW 55.4 billion for the KCUs and KRW 447.4 billion for the KOCs, accounting for 87.5%, 1.4%, and 11.1%, respectively. The total payments in the exchange market were KRW 1,836.2 billion and those in the over-the-counter market were KRW 2,198.5 billion, accounting for 45.5% and 54.5% of the total payments, respectively, and the proportions were similar to those for the trading volume.

The trading of KAU19 by market makers was conducted from July '19 to August '20. Of a total trading volume of 2.4 Mt, the selling volume was 2.3 Mt and the buying volume was 0.1 Mt, accounting for 5.9% and 0.3% of the total trading volume of KAU19. The total selling payments by market makers were KRW 74.2 billion and the total buying payments were KRW 2.7 billion, accounting for 6.1% and 0.2% of the total KAU19 trading payments, respectively. The average trading price for the market makers was KRW 31,010, with an average selling and buying price of KRW 33,175 and KRW 28,845, respectively. The average selling price was higher than the average buying price by KRW 4,330.

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



〈Table Ⅲ-1〉 Total Trading Volume for All Types of Emission Permit by Quarter and Year

(Unit: kt)

Type of Emission Permit	Type of Trading		Trading Volume By Quarter																									Trading Volume By Year						Total	Proportion
			'15 Q1	'15 Q2	'15 Q3	'15 Q4	'16 Q1	'16 Q2	'16 Q3	'16 Q4	'17 Q1	'17 Q2	'17 Q3	'17 Q4	'18 Q1	'18 Q2	'18 Q3	'18 Q4	'19 Q1	'19 Q2	'19 Q3	'19 Q4	'20 Q1	'20 Q2	'20 Q3	'15	'16	'17	'18	'19	'20		
KAU	Exchange	Real-Time	1	-	-	12	2	321	440	155	852	1,282	690	816	1,522	2,837	193	35	543	1,425	1,945	572	804	2,969	3,020	13	918	3,641	4,588	4,485	6,793	20,439	12.5%
		Block	-	-	-	308	22	680	418	250	1,681	5,712	705	1,970	2,130	4,824	672	653	432	1,112	1,479	321	406	1,832	1,577	308	1,370	10,067	8,278	3,343	3,815	27,181	16.6%
		Auction	-	-	-	-	-	274	-	-	-	-	-	-	-	4,665	-	-	1,510	3,140	1,650	1,650	2,050	2,721	1,563	-	274	-	4,665	7,950	6,334	19,222	11.7%
	Over-the-Counter		-	-	-	8	148	372	468	643	240	5,933	398	934	13,065	10,012	1,335	2,737	630	4,151	11,567	1,394	3,398	6,551	5,938	8	1,631	7,504	27,149	17,742	15,888	69,922	42.7%
	Subtotal		1	-	-	328	172	1,647	1,327	1,048	2,772	12,927	1,792	3,720	16,716	22,338	2,200	3,425	3,115	9,827	16,641	3,937	6,658	14,074	12,099	329	4,193	21,212	44,679	33,520	32,830	136,764	83.5%
KCU	Exchange	Real-Time	-	5	-	33	37	287	100	59	-	296	-	-	-	-	-	-	-	-	-	-	-	-	-	38	482	296	-	-	-	816	0.5%
		Block	-	775	-	108	290	1,111	-	-	-	27	-	-	-	-	-	-	-	-	-	-	-	-	-	883	1,401	27	-	-	-	2,311	1.4%
	Over-the-Counter		-	-	-	-	276	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	296	-	-	-	-	296	0.2%
	Subtotal		-	780	-	141	603	1,418	100	59	-	323	-	-	-	-	-	-	-	-	-	-	-	-	-	921	2,180	323	-	-	-	3,424	2.1%
KOC	Exchange	Real-Time	-	-	-	-	-	2	200	459	150	318	91	145	-	145	-	82	27	3	101	20	83	50	-	-	662	703	226	151	133	1,875	1.1%
		Block	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	60	665	39	326	-	15	15	-	-	-	-	73	1,030	30	1,133	0.7%
	Over-the-Counter		-	1,130	1,913	1,371	2,294	1,524	463	654	655	1,563	566	1,242	191	1,152	103	923	664	908	1,070	741	357	613	562	4,413	4,934	4,026	2,370	3,383	1,532	20,659	12.6%
	Subtotal		-	1,130	1,913	1,371	2,294	1,526	663	1,113	805	1,881	656	1,387	191	1,296	117	1,065	1,356	949	1,498	761	455	678	562	4,413	5,596	4,729	2,670	4,565	1,695	23,667	14.4%
All Types of Emission Permit	Exchange	Real-Time	1	5	-	45	38	611	740	673	1,002	1,896	781	961	1,522	2,982	193	116	571	1,428	2,046	592	887	3,019	3,020	51	2,062	4,640	4,814	4,636	6,926	23,130	14.1%
		Block	-	775	-	416	312	1,791	418	250	1,681	5,739	705	1,970	2,130	4,824	685	713	1,097	1,150	1,805	321	421	1,847	1,577	1,191	2,771	10,094	8,351	4,373	3,845	30,626	18.7%
		Auction	-	-	-	-	-	274	-	-	-	-	-	-	-	4,665	-	-	1,510	3,140	1,650	1,650	2,050	2,721	1,563	-	274	-	4,665	7,950	6,334	19,222	11.7%
	Over-the-Counter		-	1,130	1,913	1,379	2,718	1,915	931	1,297	895	7,496	963	2,176	13,256	11,164	1,438	3,660	1,294	5,058	12,637	2,135	3,755	7,165	6,501	4,421	6,861	11,530	29,519	21,125	17,420	90,877	55.5%
	Subtotal		1	1,910	1,913	1,840	3,069	4,591	2,089	2,220	3,577	15,131	2,449	5,108	16,908	23,635	2,317	4,490	4,471	10,776	18,139	4,698	7,113	14,751	12,661	5,663	11,969	26,264	47,349	38,084	34,525	163,855	100.0%

〈Table Ⅲ-2〉 Average Trading Price for All Types of Emission Permit by Quarter and Year

(Unit: KRW/t)

Type of Emission Permit	Type of Trading		Average Trading Price By Quarter																									Average Trading Price By Year						Average
			'15 Q1	'15 Q2	'15 Q3	'15 Q4	'16 Q1	'16 Q2	'16 Q3	'16 Q4	'17 Q1	'17 Q2	'17 Q3	'17 Q4	'18 Q1	'18 Q2	'18 Q3	'18 Q4	'19 Q1	'19 Q2	'19 Q3	'19 Q4	'20 Q1	'20 Q2	'20 Q3	'15	'16	'17	'18	'19	'20	
KAU	Exchange	Real-Time	8,370	-	-	11,300	15,991	17,864	17,167	18,961	22,146	20,556	20,298	22,495	21,930	22,325	22,453	23,489	26,069	27,773	29,555	35,961	39,371	34,468	22,100	10,998	17,712	21,314	22,208	29,384	29,549	25,854
		Block	-	-	-	12,073	17,324	17,602	16,652	17,920	21,528	20,588	20,415	22,285	21,981	22,092	22,012	22,704	25,356	27,261	28,596	39,499	39,094	34,861	23,681	12,073	17,366	21,065	22,105	28,780	30,690	23,393
		Auction	-	-	-	-	-	16,221	-	-	-	-	-	-	-	22,500	-	-	26,322	26,958	28,900	36,583	38,922	33,468	22,760	-	16,221	-	22,500	29,238	32,591	28,522
	Over-the-Counter			-	-	12,700	13,235	17,430	15,995	16,244	23,561	20,671	20,300	21,660	21,438	22,591	24,050	22,939	25,981	27,338	28,528	34,810	39,293	34,568	28,080	12,700	16,169	20,867	22,143	28,653	33,154	26,019
	Subtotal			-	-	12,060	13,784	17,385	16,591	17,045	21,894	20,623	20,344	22,174	21,552	22,430	23,288	22,900	26,075	27,271	28,691	36,103	39,176	34,373	25,327	12,044	16,901	21,038	22,180	28,902	32,013	25,824
KCU	Exchange	Real-Time	-	10,146	-	12,988	16,150	18,514	17,750	18,500	-	20,605	-	-	-	-	-	-	-	-	-	-	-	-	-	12,637	18,173	20,605	-	-	-	18,800
		Block	-	10,287	-	14,600	16,603	18,468	-	-	-	20,813	-	-	-	-	-	-	-	-	-	-	-	-	-	10,815	18,082	20,813	-	-	-	15,337
	Over-the-Counter			-	-	-	15,599	13,700	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15,471	-	-	-	-	15,471
	Subtotal			10,286	-	14,222	16,116	18,410	17,750	18,500	-	20,622	-	-	-	-	-	-	-	-	-	-	-	-	-	10,889	17,747	20,622	-	-	-	16,175
KOC	Exchange	Real-Time	-	-	-	-	-	18,500	18,000	18,180	23,446	20,804	20,625	22,135	-	23,413	-	23,737	26,077	28,300	29,721	39,300	40,135	40,670	.	-	18,127	21,617	23,530	30,302	40,336	22,645
		Block	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25,255	24,500	25,100	28,749	29,236	.	39,450	40,600	.	-	-	-	24,636	26,549	-	26,781
	Over-the-Counter			10,242	11,003	11,498	15,367	17,985	18,000	17,757	18,743	21,683	19,230	20,208	21,650	20,266	21,677	21,258	25,852	21,758	26,354	23,298	39,758	25,320	0	10,962	16,739	20,405	20,826	24,353	19,385	18,131
	Subtotal			10,242	11,003	11,498	15,367	17,986	18,000	17,931	19,617	21,535	19,423	20,409	21,650	20,618	22,082	21,631	25,488	22,064	27,209	23,718	39,816	26,784	0	10,962	16,903	20,585	21,160	25,045	21,395	18,903
All Types of Emission Permit	Exchange	Real-Time	8,370	10,146	-	12,538	16,143	18,172	17,471	18,388	22,340	20,605	20,336	22,441	21,930	22,378	22,453	23,663	26,069	27,774	29,563	36,073	39,443	34,571	22,100	12,208	17,953	21,315	22,271	29,414	29,757	25,345
		Block	-	10,287	-	12,729	16,654	18,139	16,652	17,920	21,528	20,589	20,415	22,285	21,981	22,092	22,075	22,855	25,201	27,311	28,712	39,499	39,107	34,906	23,681	11,140	17,728	21,064	22,127	28,254	30,762	22,911
		Auction	-	-	-	-	-	16,221	-	-	-	-	-	-	-	22,500	-	-	26,322	26,958	28,900	36,583	38,922	33,468	22,760	.	16,221	.	22,500	29,238	32,591	28,522
	Over-the-Counter			10,242	11,003	11,505	15,274	17,833	16,992	17,007	20,033	20,882	19,672	20,831	21,441	22,351	23,880	22,515	25,915	26,337	28,344	30,814	39,337	33,777	25,651	10,965	16,549	20,706	22,037	27,964	31,943	24,192
	Subtotal			10,260	11,003	11,807	15,426	17,901	17,093	17,528	21,382	20,736	20,097	21,695	21,553	22,331	23,227	22,599	25,897	26,812	28,568	34,096	39,217	34,024	24,202	11,013	17,056	20,951	22,122	28,440	31,492	24,623

〈Table Ⅲ-3〉 Payments for All Types of Emission Permit by Quarter and Year

(Unit: million KRW)

Type of Emission Permit	Type of Trading		Payments By Quarter																									Payments By Year						Total	Proportion
			'15 Q1	'15 Q2	'15 Q3	'15 Q4	'16 Q1	'16 Q2	'16 Q3	'16 Q4	'17 Q1	'17 Q2	'17 Q3	'17 Q4	'18 Q1	'18 Q2	'18 Q3	'18 Q4	'19 Q1	'19 Q2	'19 Q3	'19 Q4	'20 Q1	'20 Q2	'20 Q3	'15	'16	'17	'18	'19	'20		
KAU	Exchange	Real-Time	12	0	0	136	26	5,738	7,559	2,939	18,872	26,356	14,010	18,363	33,385	63,345	4,340	814	14,162	39,571	57,476	20,582	31,647	102,342	66,752	147	16,262	77,601	101,883	131,791	200,741	528,425	13.1%
		Block	-	-	-	3,718	381	11,971	6,959	4,480	36,180	117,598	14,383	43,900	46,810	106,567	14,787	14,826	10,954	30,300	42,291	12,675	15,870	63,864	37,344	3,718	23,791	212,062	182,989	96,221	117,079	635,859	15.8%
		Auction	-	-	-	-	-	4,443	-	-	-	-	-	-	-	104,954	-	-	39,734	84,649	47,685	60,363	79,790	91,067	35,572	-	4,443	-	104,954	232,430	206,429	548,256	13.6%
	Over-the-Counter		-	-	-	102	1,963	6,480	7,491	10,442	5,643	122,649	8,072	20,230	280,078	226,189	32,105	62,781	16,368	113,472	329,983	48,526	133,516	226,475	166,751	102	26,376	156,594	601,153	508,348	526,742	1,819,316	45.1%
	Subtotal		12	-	-	3,956	2,370	28,633	22,008	17,861	60,695	266,603	36,466	82,493	360,273	501,054	51,232	78,420	81,217	267,992	477,435	142,145	260,823	483,748	306,420	3,967	70,872	446,257	990,980	968,789	1,050,990	3,531,856	87.6%
KCU	Exchange	Real-Time	-	47	-	429	595	5,312	1,775	1,085	-	6,107	-	-	-	-	-	-	-	-	-	-	-	-	-	477	8,766	6,107	-	-	-	15,350	0.4%
		Block	-	7,973	-	1,577	4,815	20,525	-	-	-	559	-	-	-	-	-	-	-	-	-	-	-	-	-	9,549	25,340	559	-	-	-	35,448	0.9%
	Over-the-Counter		-	-	-	-	4,308	274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,582	-	-	-	-	4,582	0.1%
	Subtotal		-	8,020	-	2,006	9,717	26,111	1,775	1,085	-	6,667	-	-	-	-	-	-	-	-	-	-	-	-	-	10,026	38,688	6,667	-	-	-	55,380	1.4%
KOC	Exchange	Real-Time	-	-	-	-	-	45	3,600	8,352	3,505	6,609	1,873	3,210	-	3,390	-	1,937	714	78	3,004	786	3,332	2,034	-	-	11,997	15,198	5,326	4,583	5,366	42,470	1.1%
		Block	-	-	-	-	-	-	-	-	-	-	-	-	-	-	334	1,470	16,685	1,120	9,543	-	604	596	-	-	-	-	1,804	27,348	1,200	30,352	0.8%
	Over-the-Counter		-	11,574	21,046	15,759	35,248	27,401	8,326	11,614	12,276	33,891	10,876	25,103	4,146	23,340	2,242	19,631	17,169	19,750	28,206	17,267	14,179	15,524	-	48,379	82,589	82,146	49,358	82,392	29,702	374,567	9.3%
	Subtotal		-	11,574	21,046	15,759	35,248	27,446	11,926	19,966	15,782	40,500	12,749	28,313	4,146	26,730	2,575	23,037	34,568	20,947	40,754	18,053	18,115	18,154	-	48,379	94,586	97,344	56,488	114,323	36,268	447,388	11.1%
All Types of Emission Permit	Exchange	Real-Time	12	47	-	565	620	11,095	12,934	12,376	22,377	39,073	15,883	21,573	33,385	66,735	4,340	2,750	14,876	39,649	60,480	21,368	34,979	104,375	66,752	624	37,025	98,906	107,210	136,373	206,107	586,245	14.5%
		Block	-	7,973	-	5,295	5,196	32,496	6,959	4,480	36,180	118,157	14,383	43,900	46,810	106,567	15,121	16,296	27,639	31,420	51,834	12,675	16,474	64,461	37,344	13,268	49,131	212,621	184,793	123,568	118,279	701,660	17.4%
		Auction	-	-	-	-	-	4,443	-	-	-	-	-	-	-	104,954	-	-	39,734	84,649	47,685	60,363	79,790	91,067	35,572	-	4,443	-	104,954	232,430	206,429	548,256	13.6%
	Over-the-Counter		-	11,574	21,046	15,861	41,519	34,156	15,817	22,056	17,919	156,540	18,949	45,333	284,224	249,529	34,347	82,412	33,537	133,222	358,189	65,793	147,695	241,998	166,751	48,480	113,547	238,741	650,511	590,740	556,444	2,198,464	54.5%
	Subtotal		12	19,594	21,046	21,721	47,335	82,190	35,710	38,912	76,477	313,770	49,215	110,806	364,419	527,784	53,807	101,458	115,785	288,940	518,188	160,198	278,938	501,901	306,420	62,372	204,146	550,268	1,047,468	1,083,112	1,087,259	4,034,624	100.0%

2. Trading Records for the Second Compliance Year of Phase II

1) Detailed Analysis of the Trading Volume

Given the surrender of emission permits (KAU19 and KCU19) for the second compliance year of Phase II, a more specific analysis of the trading volume for each type of emission permit in both markets during the trading period for these emission permits is presented in this section (8 Nov. '18 to 11 Sep. '20).[23] The total trading volume for this trading period was 45.2 Mt. The trading volume for KAU19 was 37.9 Mt and that for KOC was 7.3 Mt, accounting for 83.8% and 16.2%, respectively.

The trading trends for KAU19 were analyzed on the basis of the monthly trading volume from Nov. '18 to Sep. '20. The trading volume drastically increased from Mar. '20, the month close to the time when the emissions reports were to be submitted, until June, which had the highest trading volume, and then it drastically decreased starting in September, the month after August, when the surrender of the emission permits ended. Because the submission of the emissions reports and the following relevant due dates were postponed for one month to mitigate the burden on the industries that had difficulties in preparing and submitting the legal documents due to the effects of COVID-19, the trading trends were different from those of KAU18, for which the trading volume was highest in Aug. '19 and then significantly decreased. This trend indicates that the operation and schedule of the K-ETS are the main factors affecting the trading volume.

In terms of the emission permit type, 50.2% of the total KAU19 trading volume occurred from the second quarter of '20. The KOC trading volume was the highest in the third quarter of '19 (1.5 Mt), accounting for 20.4% of the total KOC trading volume.

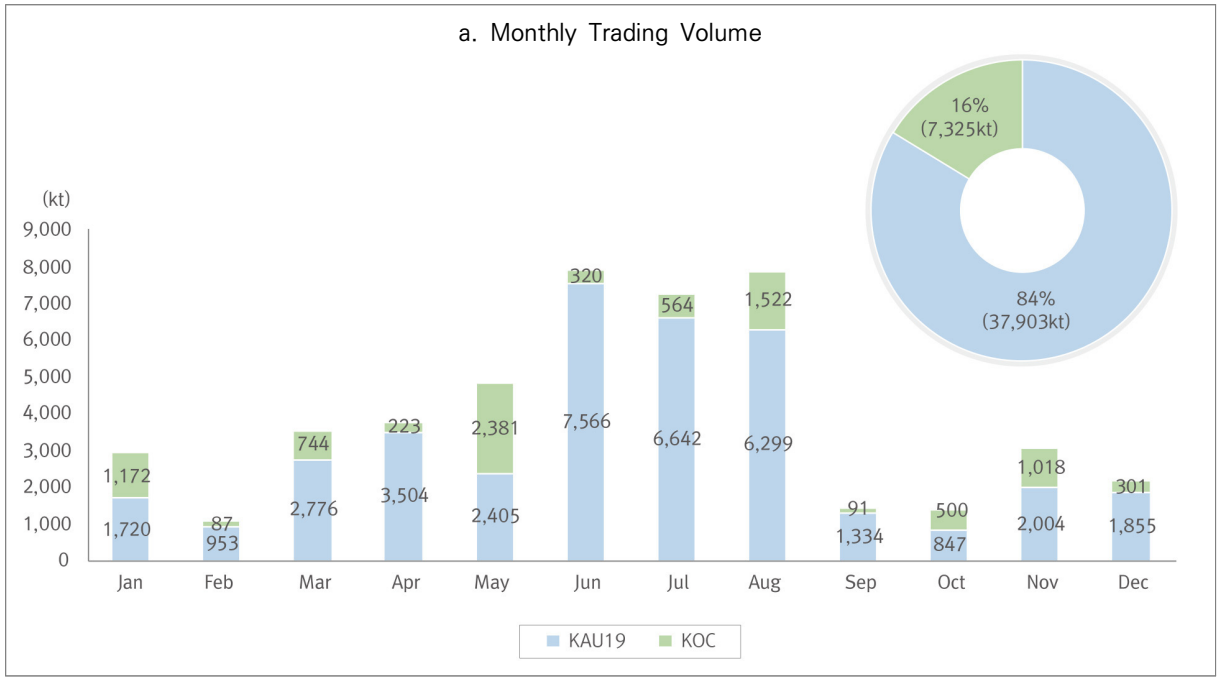
[23] KCU19 was excluded from this analysis due to the absence of trading for this emission permit type.

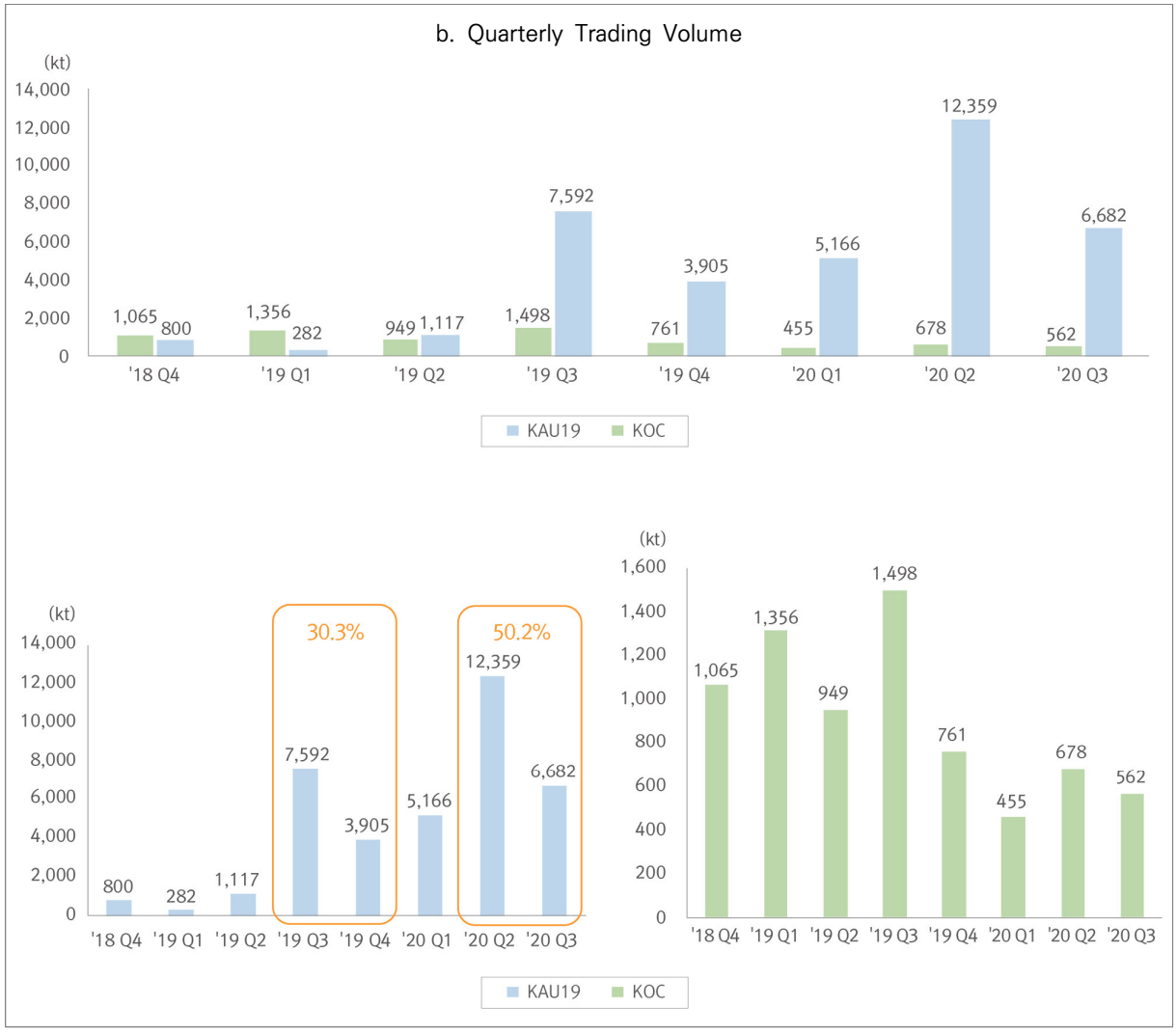
⟨Table Ⅲ-4⟩ Trading Volume for Each Emission Permit Type by Quarter and Year

(Unit: kt)

Types of Emission Permit	Type of Trading	Trading Volume By Quarter								Trading Volume By Year			Total	Proportion
		'18 Q4	'19 Q1	'19 Q2	'19 Q3	'19 Q4	'20 Q1	'20 Q2	'20 Q3	'18	'19	'20		
KAU19	Real-Time	-	50	19	650	570	764	2,853	2,005	-	1,289	5,623	6,912	15.3%
	Block	-	232	140	76	291	244	1,772	845	-	739	2,861	3,600	8.0%
	Auction	-	-	-	1,650	1,650	2,050	2,721	479	-	3,300	5,250	8,550	18.9%
	Over-the-Counter	800	-	958	5,216	1,394	2,108	5,012	3,353	800	7,568	10,473	18,841	41.7%
	Subtotal	800	282	1,117	7,592	3,905	5,166	12,359	6,682	800	12,896	24,207	37,903	83.8%
KOC	Real-Time	82	27	3	101	20	83	50	-	82	151	133	366	0.8%
	Block	60	665	39	326	-	15	15	-	60	1,030	30	1,120	2.5%
	Over-the-Counter	923	664	908	1,070	741	357	613	562	923	3,383	1,532	5,839	12.9%
	Subtotal	1,065	1,356	949	1,498	761	455	678	562	1,065	4,565	1,695	7,325	16.2%
All Types of Emission Permit	Real-Time	82	77	21	752	590	847	2,903	2,005	82	1,441	5,756	7,278	16.1%
	Block	60	897	179	402	291	259	1,787	845	60	1,769	2,891	4,720	10.4%
	Auction	-	-	-	1,650	1,650	2,050	2,721	479	-	3,300	5,250	8,550	18.9%
	Over-the-Counter	1,723	664	1,866	6,286	2,135	2,465	5,626	3,915	1,715	10,887	12,005	24,680	54.6%
	Total	1,865	1,638	2,066	9,090	4,666	5,621	13,037	7,244	1,857	17,397	25,902	45,228	100.0%

⟨Figure Ⅲ-2⟩ Trading Volume Proportion for Each Emission Permit Type and Trends in Their Trading Volume



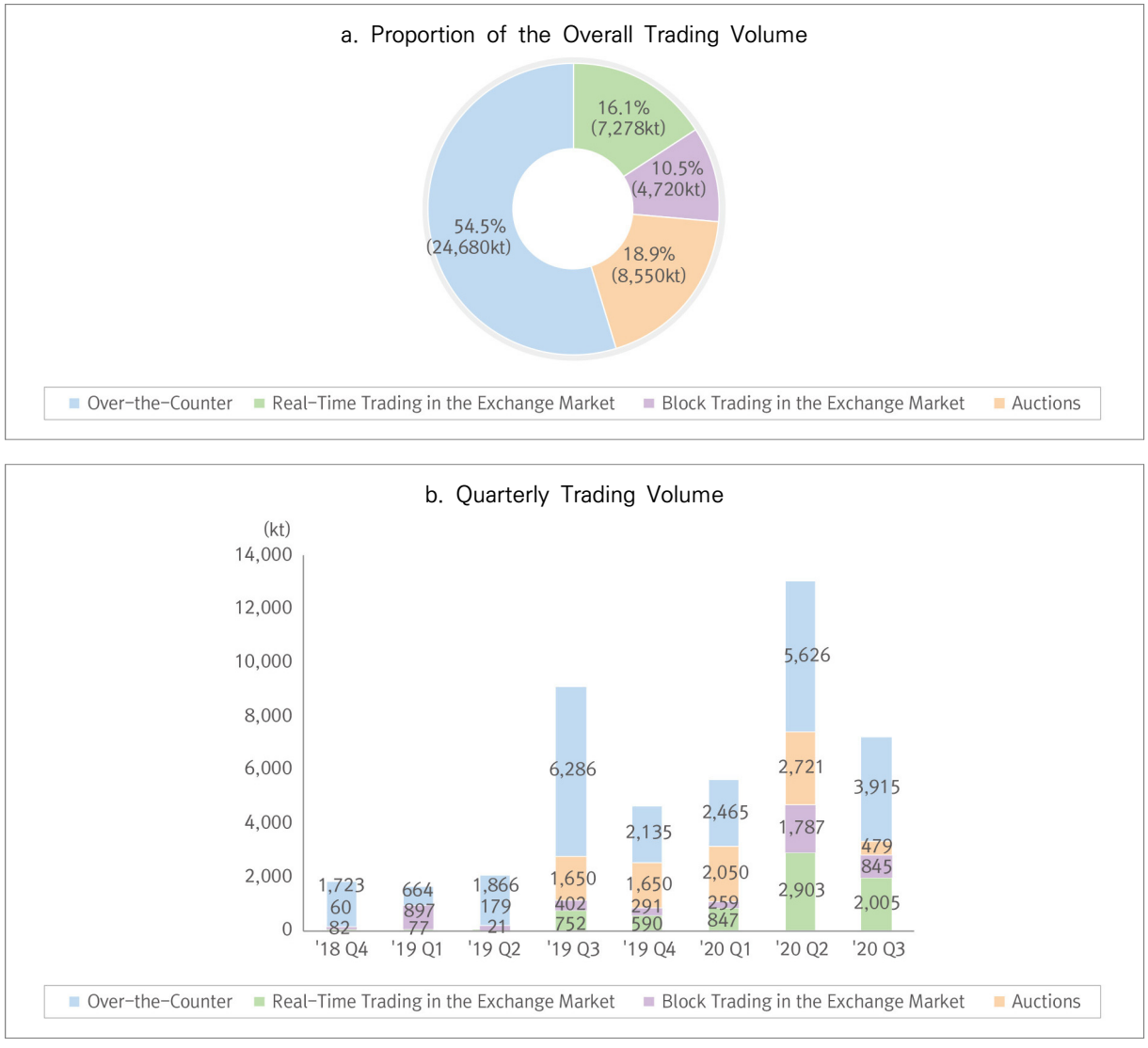


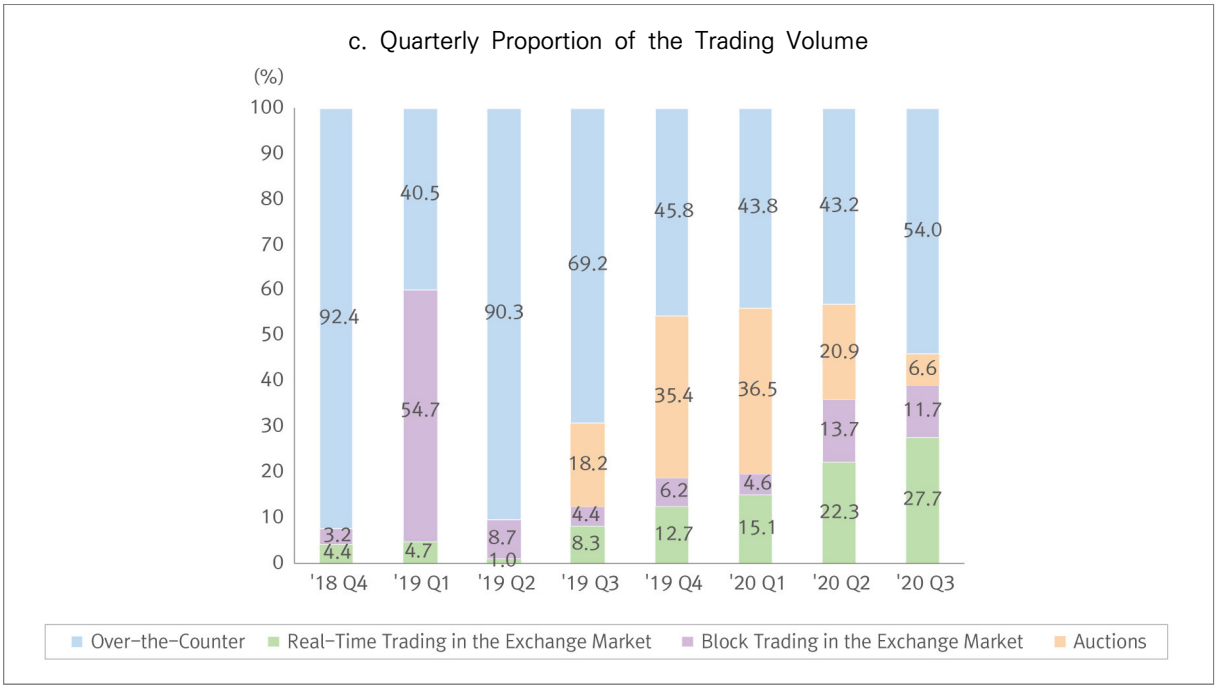
In terms of the trading market, of the total trading volume (45.2 Mt), 20.5 Mt (45.4%) was traded in the exchange market and 24.7 Mt (54.6%) in the over-the-counter market. The proportion of the trading volume in the exchange market was about 11.0%p higher than that of KAU18.[24] In the exchange market, the trading volume was 8.6 Mt (18.9%) via auction, 7.3 Mt (16.1%) via real-time trading, and 4.7 Mt (10.4%) via block trading. The proportion of the volume of real-time trading in the exchange market steadily increased from the third quarter of '19, accounting for 27.7% of the total trading volume in the third quarter of '20. From the third quarter of '19, when auctions for KAU19 started, to the third quarter of '20, the trading volume via auction accounted for 18.2%, 35.4%, 36.5%, 20.9%, and 6.6% of the total trading volume for

[24] Regarding the trading volume for KAU18, the proportion for the exchange market was 34.5%, and that for the over-the-counter market was 65.5%.

each quarter. This shows that the proportion of the trading volume via auction was high for the entire market for emission permits, but it started to decrease gradually from the first quarter of '20.

〈Figure Ⅲ-3〉 Trends in the Trading Proportion and Trading Volume for Each Trading Market





〈Table Ⅲ-5〉 Trading Volume for Each Trading Type by Quarter and Year

(Unit: kt)

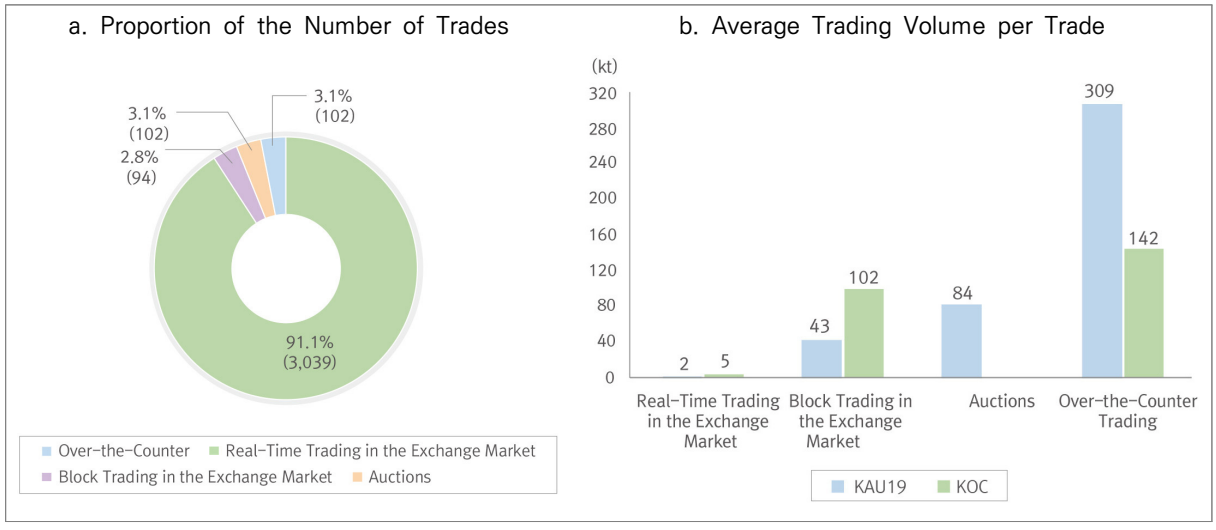
Type of Trading		Trading Volume By Quarter								Trading Volume By Year			Total	Proportion
		'18 Q4	'19 Q1	'19 Q2	'19 Q3	'19 Q4	'20 Q1	'20 Q2	'20 Q3	'18	'19	'20		
Exchange	Real-Time	82	77	21	752	590	847	2,903	2,005	82	1,441	5,756	7,278	16.1%
	Block	60	897	179	402	291	259	1,787	845	60	1,769	2,891	4,720	10.4%
	Auction	-	-	-	1,650	1,650	2,050	2,721	479	-	3,300	5,250	8,550	18.9%
Over-the-Counter		1,723	664	1,866	6,286	2,135	2,465	5,626	3,915	1,723	10,951	12,005	24,608	54.6%
Total		1,865	1,638	2,066	9,090	4,666	5,621	13,037	7,244	1,865	17,461	25,902	45,228	100.0%

During the trading period for the emission permits subject to surrender (8 Nov. '18 to 11 Sep. '20), the number of trades was 3,337, with 3,235 (96.9%) of these made in the exchange market and only 102 (3.1%) in the over-the-counter market. In the exchange market, a total of 3,039 trades were made via real-time trading (91.1%), making it the most common trading type.

Overall, the average trading volume (involving KAU19 and KOC) per trade was 13.6 kt, though it was 6.4 kt in the exchange market and 242.0 kt in the over-the-counter market, which was about 38 times larger in comparison with the exchange market. This shows that many small trades occurred in the exchange market, while fewer,

larger trades were made in the over-the-counter market. Real-time trading, which accounted for the highest number of trades in the exchange market, had the lowest average trading volume (2.4 kt). The average trading volume per trade for block trading and auctions in the exchange market was 50.2 kt and 83.8 kt, respectively; both were very low compared to the average trading volume for the over-the-counter market. The average trading volume per trade for KAU19 was 11.8 kt and that for KOC was 59.6 kt. The highest average trading volume per trade was found in the over-the-counter market for both permit types (308.9 kt and 142.4 kt, respectively).

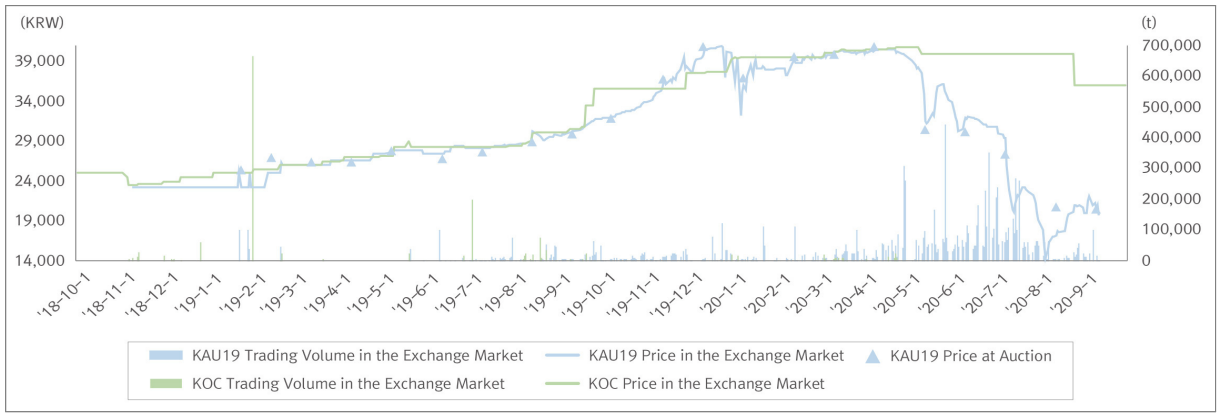
〈Figure Ⅲ-4〉 Proportion of the Number of Trades by Trading Type and Average Trading Volume per Trade



2) Detailed Analysis of Prices in the Exchange Market

During the trading period for KAU19, the price for KAU19 and KOC was similar (KRW 23,200 and KRW 23,500, respectively) in the early stages (early Nov. '18). The difference between the two started to increase gradually from the end of Sep. '19 (KRW 31,699 and KRW 35,600, respectively) with the largest difference of KRW 22,329 on 14 Aug. '20 (KRW 17,671 and KRW 40,000, respectively). KCU19 was not traded during this trading period.

〈Figure Ⅲ-5〉 Trends in the Trading Volume and Price in the Exchange Market by Emission Permit Type[25)]



In Phase Ⅱ, the market started with KAU19 priced at KRW 23,200 and KOC at KRW 23,500, and their prices ranged between KRW 23,200 and 30,000 until Set. '19. The frequency of trading later increased, and the prices gradually increased as well. KAU19 has been continuously traded since Sep. '20.

The price for KAU19 decreased from Apr. '20 due to COVID-19 and the deferring of the K-ETS schedule, but it increased from August. The highest and lowest prices for KAU19 were KRW 40,900 (23 Dec. '19) and KRW 14,329 (5 Aug. '20), respectively, and those of KOC were KRW 40,800 (23 Apr. to 8 May '20) and KRW 22,200 (19 Mar. to 23 May '18). Thirteen auctions for KAU19 were held once a month from Jul. '19 to Jul. '20, and the price at these auctions was similar to the market price of the exchange market. The lowest auction price was KRW 27,400 in Jul. '20 and the highest was KRW 41,000 in Apr. '20.

25) The weighted average of the actual trading prices for the individual types of emission permit in the exchange market on each trading day. In the absence of trading price information, the KRX closing price on the trading day was applied to the analysis.

Stakeholder Survey

Ⅳ. Stakeholder Survey

1. Overview of the Stakeholder Survey

A survey was conducted with liable entities participating in the K-ETS on their views of the K-ETS, its implementation, the patterns of emissions trading, and the prospect for the price of the emission permits. The survey was conducted for five weeks from 22 Sep. '20 to 27 Oct. '20 by selecting a total of 611 liable entities[26] from all six sectors as subjects of the survey, with a response rate of 48.0% (293 of the 611 subjects).[27] The liable entities were selected to be evenly distributed across the six sectors designated by the K-ETS (industry, power, buildings, transport, waste, and public services/other sectors), and the distribution of the responding liable entities within the individual sub-sectors was similar to the distribution of the sample liable entities originally selected for the survey within the individual sub-sectors. Therefore, the representativeness of the survey sample was relatively high.

2. Survey Results

1) Views and Assessment of the K-ETS

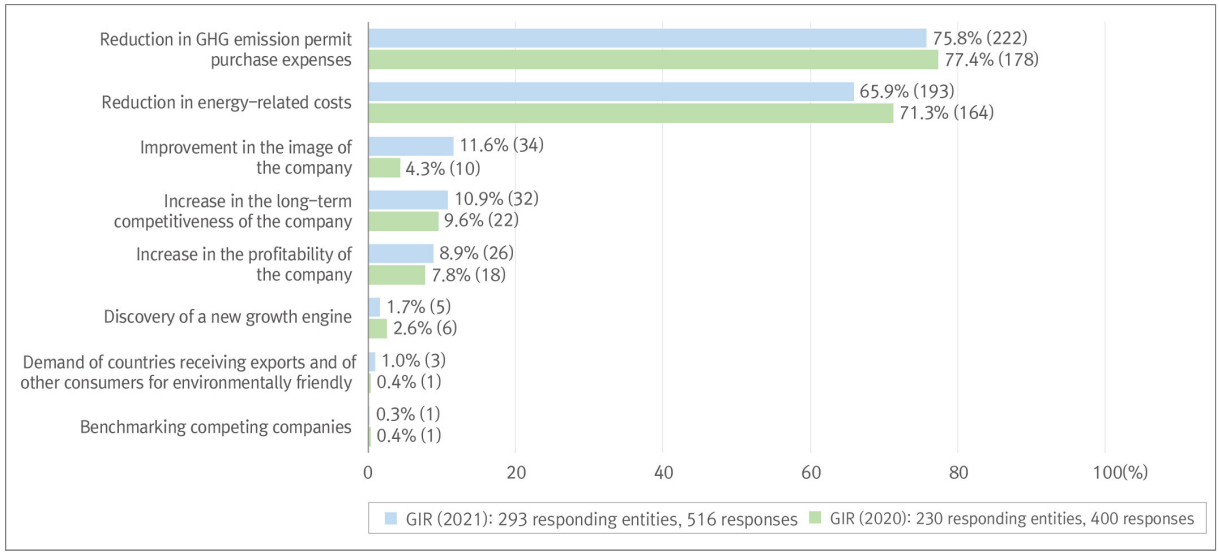
The views that the liable entities had about K-ETS operations were investigated. According to 〈Figure Ⅳ-1〉, the principal motivation of the liable entities in participating in the K-ETS included the reduction in the purchase expenses for GHG emission permits (75.8%) and the reduction in energy-related costs (65.9%); these results were consistent with those from the survey conducted by the GIR ('20) in the previous year. As found in the survey conducted by the GIR ('20), the liable entities participated in activities to reduce GHG emissions or in the K-ETS to accomplish the short-term goal of reducing costs rather than long-term goals such as improving the image of the company (11.6%), increasing the long-term competitiveness of the

26) The survey was conducted with those liable entities that participated in Phase Ⅰ among those certified for the first compliance year of Phase Ⅱ ('18 to '20).

27) A link of the questionnaire was sent twice via e-mail to the person-in-charge of the liable entities selected for the survey, and text messages were sent three times to the person-in-charge during the survey period to provide information about the survey and to encourage their participation.

company (10.9%), and discovering a new growth engine (1.7%).

〈Figure Ⅳ-1〉 Motivations for Participating in GHG Emission Reduction Activities and Reponses to the K-ETS (up to two responses allowed)

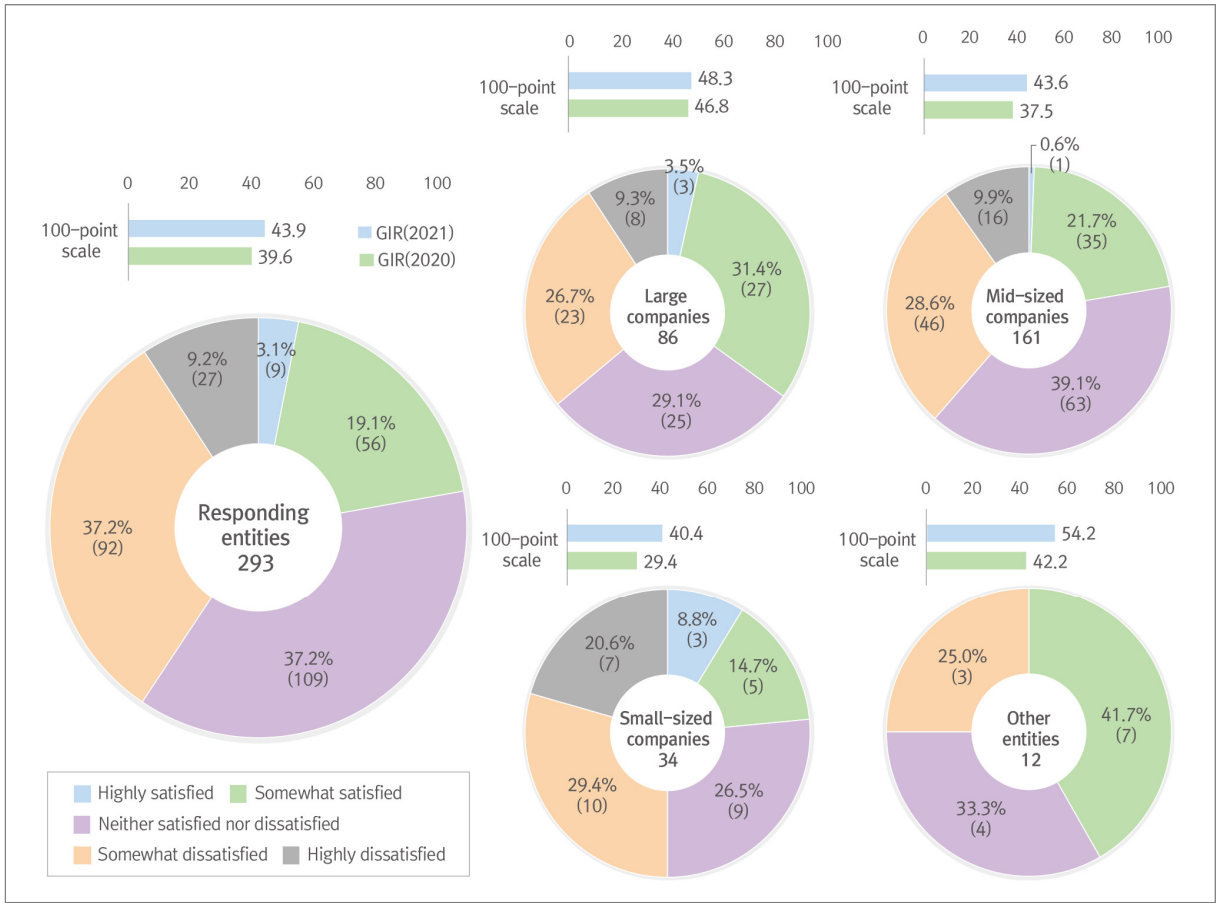


The views of the responding liable entities on the impact of the K-ETS on overall business operations were analyzed. As shown in 〈Figure Ⅳ-2〉, more entities were dissatisfied (40.6%) than satisfied (22.2%); the number of dissatisfied entities was 1.8 times higher than that of satisfied entities.[28] The average satisfaction with the impact on overall business operations, calculated on a 100-point scale,[29] was 43.9 points, slightly higher than the satisfaction score (39.6 points) in the survey by the GIR ('20).

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

29) Conversion of the five-point scale to the 100-point scale: "Highly satisfied" (100.0) "Somewhat satisfied" (75.0), "Neither satisfied nor dissatisfied" (50.0), "Somewhat dissatisfied" (25.0), and "Highly dissatisfied" (0.0).

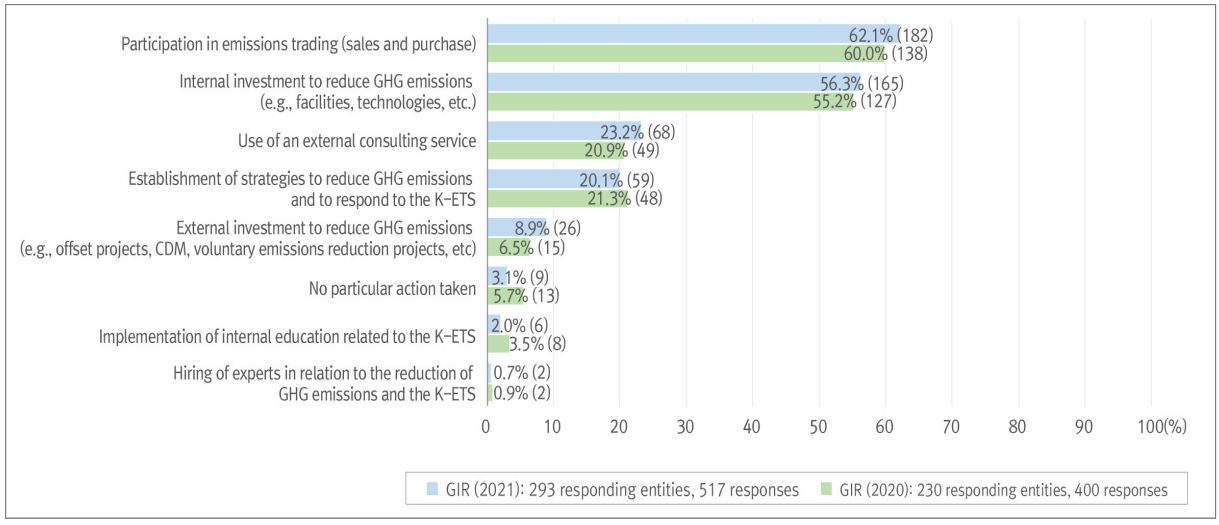
〈Figure Ⅳ-2〉 Degree of Satisfaction with the Impact of the K-ETS on Overall Business Operations



2) Response to and Compliance with the K-ETS

The actions that were actually taken by the entities in response to the K-ETS were emission permit trading (62.1%), internal investment in facilities and technologies (56.3%), the use of an external consulting service (23.2%), and the establishment of a response strategy (20.1%). These results were the same as for the GIR survey ('20). The proportions of other actions, such as external investment in external offset projects and CDM (8.9%), the implementation of relevant internal education (2.0%), and the hiring of relevant experts (0.7%) were less than 10%. Nine of the responding entities (3.1%) responded that they did not take a particular action.

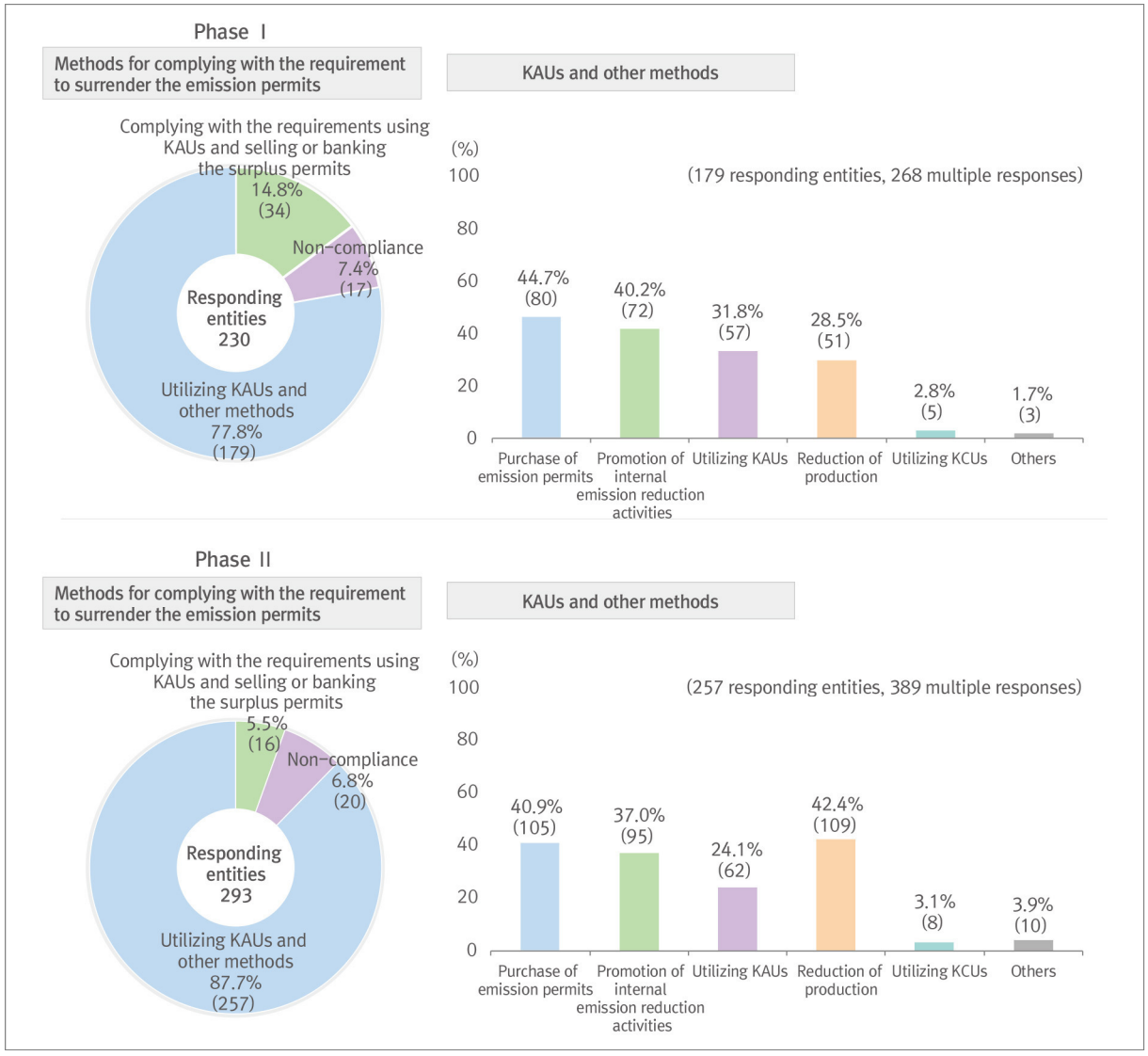
〈Figure Ⅳ-3〉 Actions Taken in Response to the K-ETS (up to two responses allowed)



With regard to the methods for complying with the requirement to surrender the emission permits in Phase II, except for the 20 entities (6.8%) that responded with noncompliance, 16 entities (5.5%) complied with the requirement to surrender the emission permits using KAUs only, and 257 entities (87.7%) used KAUs and other methods.

The most common methods employed by the entities that used KAUs and other methods included a reduction in production (42.4%), the purchase of emission permits (40.9%), the promotion of internal emission reduction activities (37.0%), and the utilization of KAUs (24.1%). The most common method for complying with the requirement to surrender the emission permits was the purchase of emission permits (44.7%) in Phase I, but it was the increase in the proportion of companies that reduced production (42.4%) in Phase II that led to the overall reduction in the proportions of other methods for compliance. This is consistent with the results shown in 〈Figure Ⅳ-4〉, indicating that the reduction of emissions was due to the reduction of production.

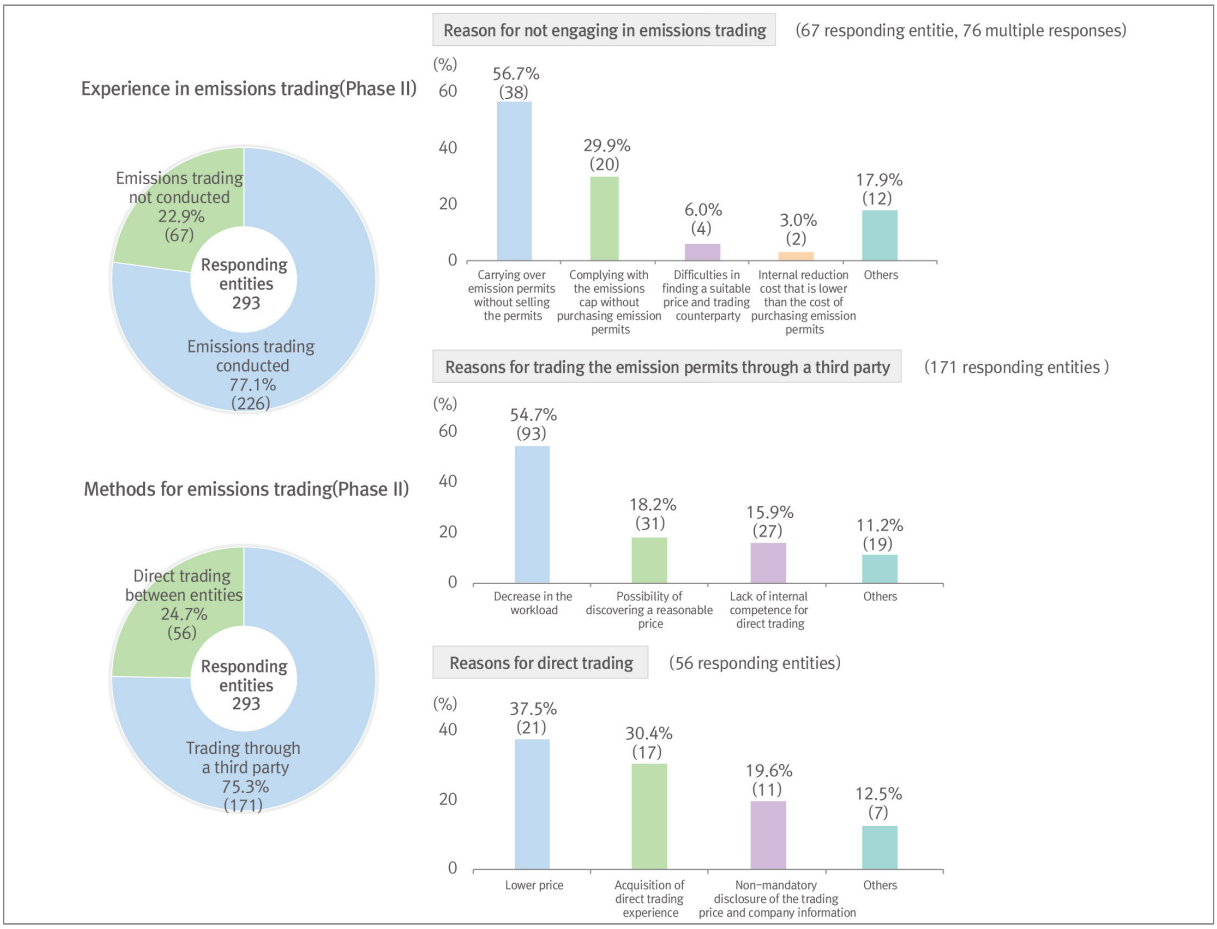
〈Figure Ⅳ-4〉 Methods for meeting Emissions Allowances



With regard to experience in emission trading, 77.1% of the responding entities had an experience of trading emission permits during Phase II, while the proportion of responding entities that had never engaged in trading was also significantly high as 22.9%. The main reason for not engaging in the trading of emission permits was carrying over the emission permits without selling them (56.7%). Other reasons included complying with the emissions cap without purchasing emission permits (29.9%), difficulties in finding a suitable price and trading counterparty (6.0%), and internal reduction costs that were lower than the cost of purchasing emission permits (3.0%). Borrowing emission permits and having trading scheduled in the third compliance year were also reasons that were provided.

The emissions trading methods and the reasons for using these methods were investigated for the responding entities that had engaged in trading in Phase II. The analysis showed that a majority of the responding entities (75.3%) preferred trading through a third party, such as through the exchange or an agency, while 24.7% utilized direct trading between the entities. The main reasons for trading the emission permits through a third party included a decrease in the workload (54.7%), the possibility of finding a reasonable price (18.2%), and lack of internal competence for direct trading (15.9%). Other reasons included the low trading volume and the difficulties in finding a trading counterparty and negotiating the trading conditions. The main reasons for preferring direct trading between entities included the possibility of trading at a low price (37.5%), the acquisition of direct trading experience (30.4%), and the non-mandatory disclosure of trading price and company information (19.6%). Other reasons included trading of a large volume allowed and emissions trading with affiliates and subsidiary companies.

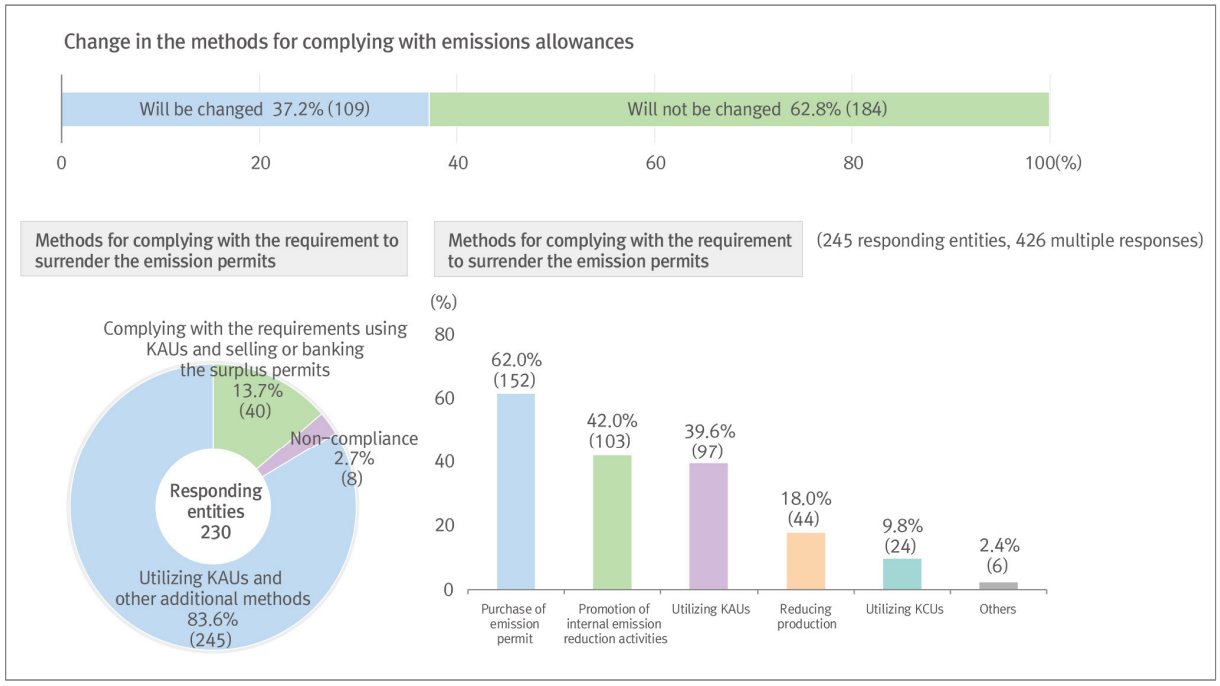
〈Figure Ⅳ-5〉 Methods for Complying with the Obligation to Surrender Emission Permits



3) Phase Ⅲ and Mid-Term Emissions Market Prospects and Response

The survey found that 109 liable entities (37.2%) would change their methods for emissions trading from Phase Ⅱ to Phase Ⅲ, while 184 liable entities (62.8%) responded that they would not change their methods. With regard to the methods for complying with the requirement to surrender the emission permits, 13.7% of the responding entities stated that they could comply with the obligation using KAUs only. Most of the entities (245 entities, 83.6%) responded that they would use KAUs and other methods together. Regarding the specific methods, a majority of the entities (62.0%) stated that they would purchase emission permits to comply with the requirement. Other methods included the promotion of internal emission reduction activities (42.0%), utilizing KAUs (39.6%), reducing production (18.0%) and utilizing KCUs (9.8%).

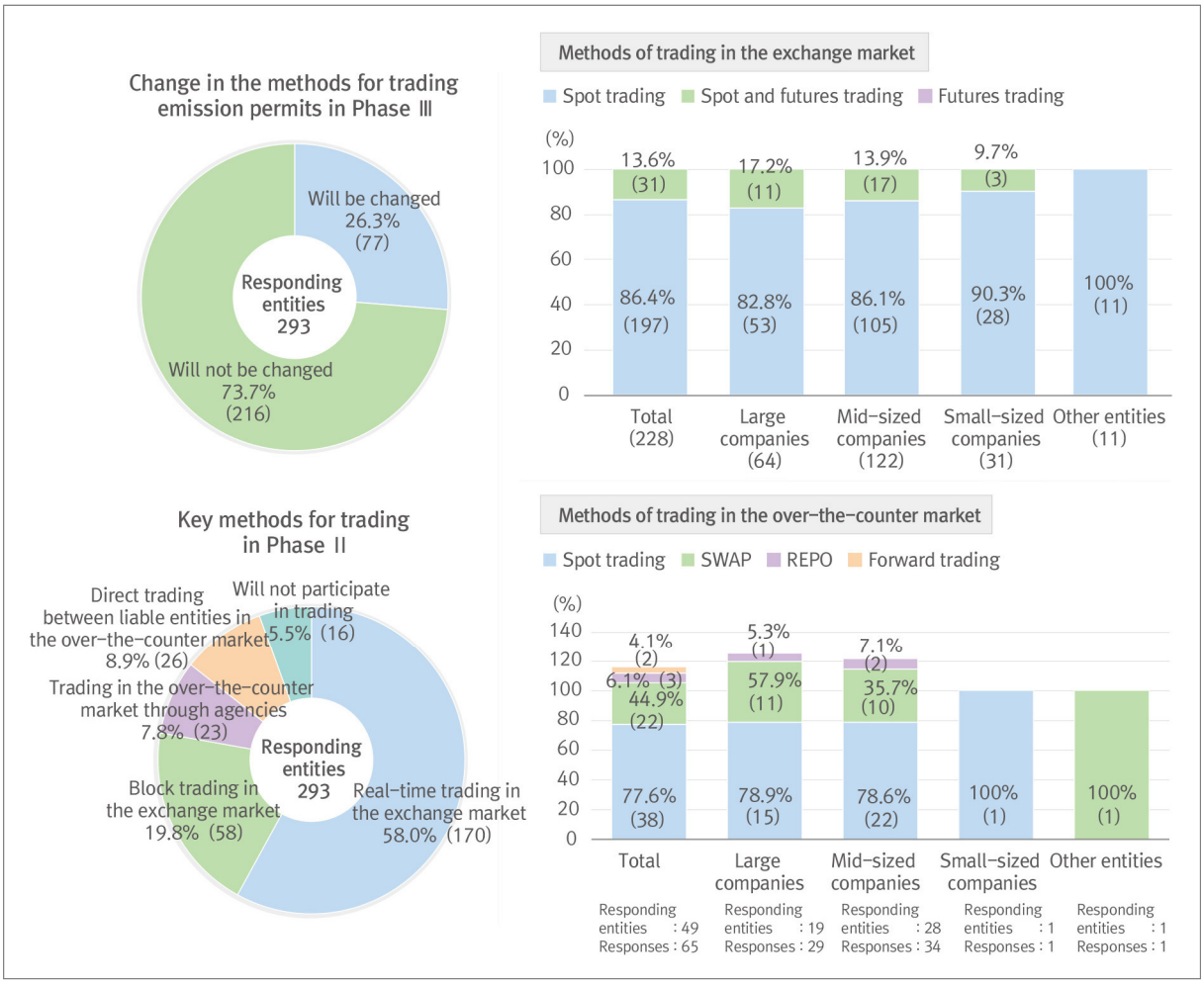
〈Figure Ⅳ-6〉 Change in the Methods for Complying with Emissions Allowances



Only 77 of the liable entities (25.3%) responded that they would change the methods of emission permit trading from Phase II to Phase III, indicating there would be no significant change in the trading methods used by the liable entities. The most common method of trading the emission permits in Phase III was to be real-time trading (58.0%) in the exchange market, and other methods included block trading in

the exchange market (19.8%), direct trading in the over-the-counter market (8.9%), and trading in the over-the-counter market through agencies (7.8%). Sixteen entities (5.5%) responded that they would not trade emission permits. Of those entities that preferred trading in the exchange market, the trading method that they would choose was predominantly spot trading (86.4%), and only 13 entities (13.6%) responded that they would use both spot and futures trading. Smaller companies preferred spot trading more (large companies: 82.8%; mid-sized companies: 86.1%; small-sized companies: 90.3%). All other entities (e.g. public institutions) (100%) responded that they would adopt spot trading.

〈Figure Ⅳ-7〉 Change in the Methods for Trading Emission Permits



Of the entities that preferred trading in the over-the-counter market, 77.6% of the responding entities stated that they would participate in spot trading, 44.9% in SWA

P,[30] 6.1% in REPO,[31] and 4.1% in forward trading (up to two responses were allowed). With regard to the utilization of the surplus emission permits, only 69 entities (23.5%) responded that they would change the method for responding to the surplus emission permits from Phase II to Phase III, and 224 entities (76.5%) responded that they would not change the method. According to 〈Figure IV-8〉, just as a majority of the entities (91.3%) responded that they would carry over the surplus emission permits in Phase II, a considerable number of the entities (78.8%) stated that they would respond by carrying them over in Phase III as well. The same trend was observed for entities of all sizes.

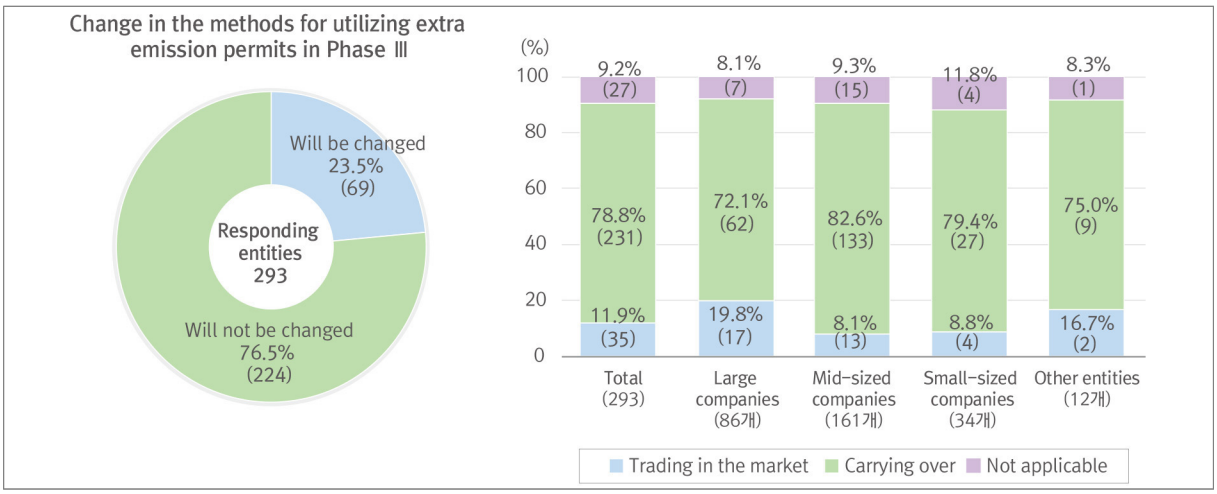
The tendency to favor the carrying over of surplus emission permits may have been affected by the characteristics and attitude of the decision-makers involved in emissions trading. The method for managing the emission permits preferred by the decision-makers in emissions trading and their investment attitude were investigated, and the results showed that 87.4% of the responding entities preferred the minimization of emissions trading, while only 12.6% of the responding entities preferred obtaining a profit and minimizing the cost of reducing GHG emissions through the trading. There was no significant difference in the preferred method for managing the emission permits between the entities of different sizes. However, other entities (e.g. public institutions) (25.0%) were more likely to prefer emissions trading aimed at obtaining a profit from trading and minimizing the cost of reducing GHG emissions compared to large companies (12.8%), mid-sized companies (13.0%), and small-sized companies (5.9%).

Regarding the investment attitude of the persons in charge of emissions management, most of the entities were classified as risk-averse (65.2%), followed by risk-neutral (33.1%) and risk-loving (1.7%).

30) A contract through which two parties exchange the cash flow from two different financial instruments.

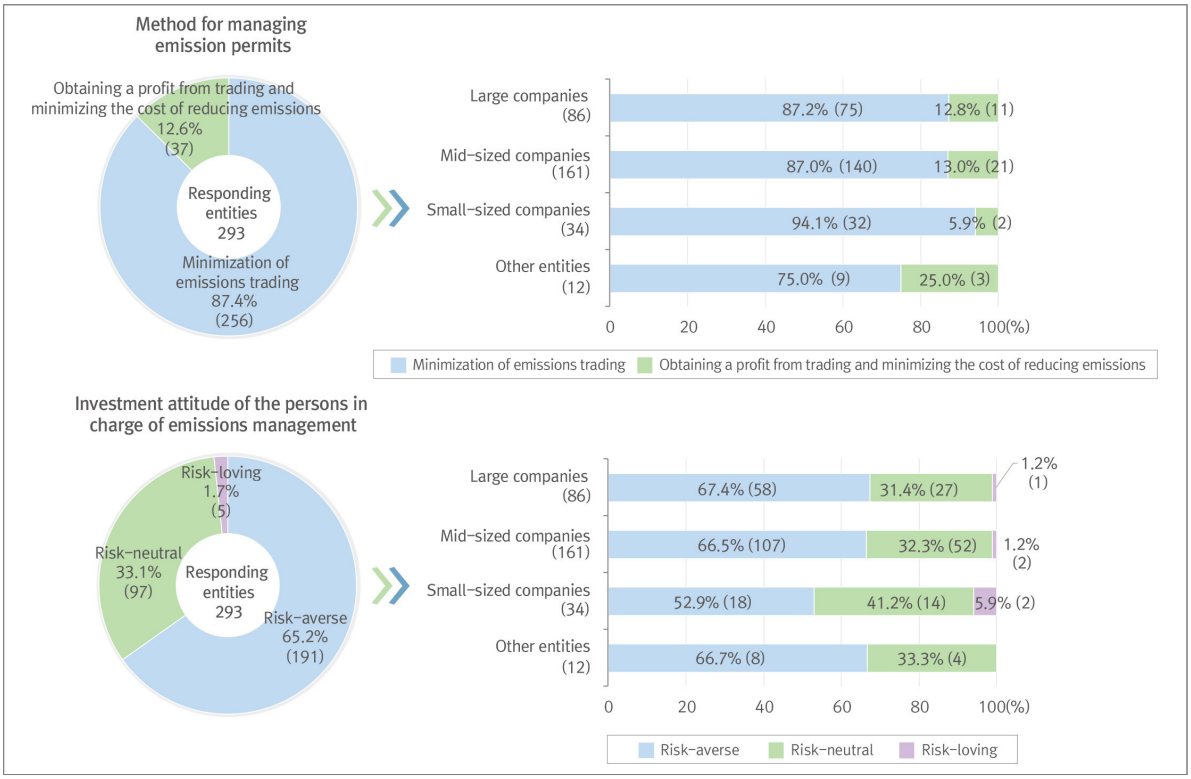
31) Repurchase agreement.

〈Figure Ⅳ-8〉 Change in the Methods for Utilizing Surplus Emission Permits



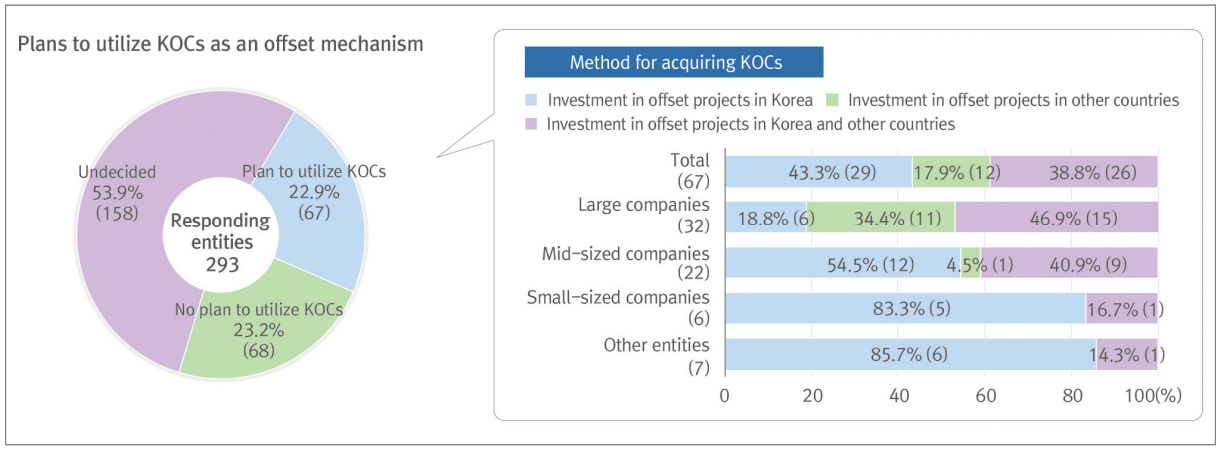
In terms of the entity size, large companies had the highest risk-averse investment attitude (67.4%), while a risk-neutral investment attitude was more common among smaller entities (Large companies: 31.4%; mid-sized companies: 32.3%; and small-sized companies: 41.2%). None of the other entities (e.g. public institutions) responded that their decision-makers in emissions trading had a risk-loving investment attitude.

〈Figure Ⅳ-9〉 Method for Managing Emission Permits and the Investment Attitude of the Persons in Charge of Emissions Management



Similar to the analysis of the methods for complying with K-ETS (see 〈Figure Ⅳ-6〉), only 22.9% of the responding entities stated that they had a mid-term or long-term plan to utilize KOCs (i.e., an offset mechanism). One notable finding was that the proportion of entities with a plan to utilize KOCs was slightly higher than in the GIR survey ('20) (18.7%). The results showed that 43.3% of the entities that had a plan to utilize KOCs responded that they invested in offset projects in Korea, while other entities preferred to invest in offset projects in Korea and other countries (38.8%) and invest in offset projects in other countries (17.9%). In terms of the size of the entity, small-sized companies and other entities (e.g. public institutions) preferred to invest in offset projects in Korea (83.3% and 85.7%, respectively), while mid-sized companies preferred offset projects in Korea (54.5%) and offset projects in Korea and other countries (40.9%). A higher proportion of large companies preferred investing in offset projects in Korea and other countries (46.9%) and offset projects in other countries (34.4%) than in offset projects in Korea (18.8%).

〈Figure Ⅳ-10〉 Mid- and Long-Term Plans to Utilize Offset Mechanisms and Methods for Acquiring KOCs



Phase II | 2018-2020

2019 Korean Emissions Trading System Report

Published in	April 2021
Published at	Ministry of Environment Greenhouse Gas Inventory and Research Center of Korea Greenhouse Gas Inventory and Research Center Osong Square, Osongsaengmyeong-ro 210, Cheongju, Chungcheongbuk-do, Republic of Korea
Published by	President of the Greenhouse Gas Inventory and Research Center
Written by	Eugene Cho (Director) Daewook Kim, Hyunah Yeo, Jaehui Lee, Kyeongah Ahn, Sungwoo Lee, Younghyun Lee, and Yumi Jung
Telephone	043-714-7533 Fax 043-714-7530
Website	http://www.gir.go.kr
Government Publication Number	11-1480906-000007-10