

Industrial Structure Council Emissions Trading System Subcommittee Interim Report

~Implementation Guidelines for Allowance Allocation, etc.~

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1. Background

Establishment of the Emissions Trading System Subcommittee

- Japan is currently advancing the implementation of a growth-oriented carbon pricing framework as a policy measure to achieve carbon neutrality by 2050 while balancing economic growth (GX).
- May 2025 saw the enactment of the revised GX Promotion Act, which stipulates that from FY2026, it will be mandatory for businesses that emit carbon dioxide of a certain scale to participate in the ETS.
- The purpose of this subcommittee is to deliberate on technical matters related to the new ETS system based on the revised GX Promotion Act.

Main issues to be discussed

- Institutional measures necessary for the launch of the system in FY2026
 - Guidelines on allocations
 - Details about calculation of emissions
 - Upper- and lower- price levels of emission allowance
 - Market operations, etc.
- Review of the above details and future development directions, etc.

Subcommittee members

Keigo Akimoto	Group Leader and Principal Researcher, RIETI
Toshihide Arimura	Professor, School of Political Science and Economics, Waseda University
Mitsuko Ikeda	Director, Keidanren
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Establishment of a Working Groups (WG) for the study of Benchmark Indicators

- Benchmark formulas require industry-specific expertise. Working groups are set up under the ETS subcommittee to conduct the review.
- Industries to be considered are selected based on
(1) the degree of institutional impact (emissions by industry, the number of operators, impact on industrial policy) and,
(2) technical difficulty (comparability between businesses based on the complexity of manufacturing processes, diversity of varieties, etc.)
The WGs consider specific formulas for calculating the benchmark for each industry and report them to the subcommittee.
- As for industries under the jurisdiction of other ministries (transportation sector, etc.), each ministry will proceed with its own study and report a specific benchmark proposal to the ETS subcommittee.

ETS Subcommittee

Manufacturing BM Study WG

- Focusing on the following industries, we will consider the calculation formula for the benchmark.

Petroleum refining, steel, chemicals (petrochemical, soda, carbon black), pulp and paper, cement, lime production, aluminum, rubber products, flat glass, glass bottles, automobiles

Power Generation BM Study WG

- Examining the calculation formula for benchmarks in the power generation sector.

Other

(industries under the jurisdiction of other ministries and agencies)

Pro-Growth Carbon Pricing

- Through the combination of carbon pricing and investment support measures, we have achieved more than 150 trillion yen in public-private GX investment over 10 years.

① Upfront investment support using **GX Economic Transition Bonds (20 trillion yen over 10 years)**

(2) Advance incentives for GX investment through carbon pricing

[GX Surcharge (Fossil fuel levy)]

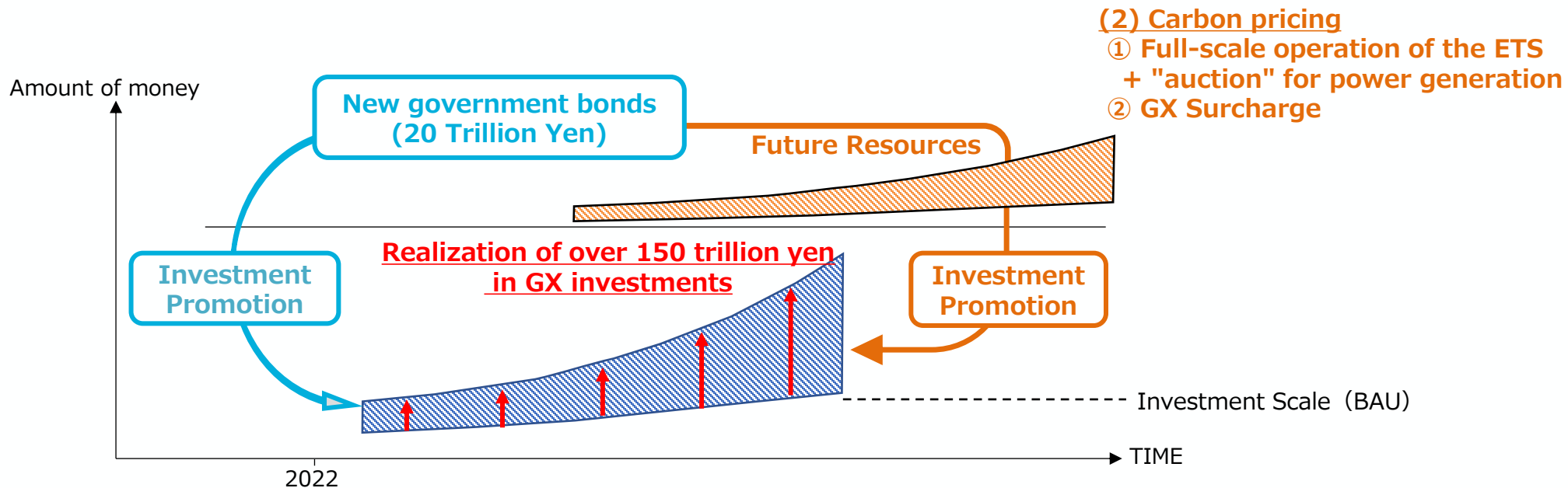
- Introduced from FY2028

[Emissions trading system]

- Started on a trial basis in the GX League from FY2023, and started full-scale operation in FY2026
- From FY2033, paid auctions will be introduced to power generation companies

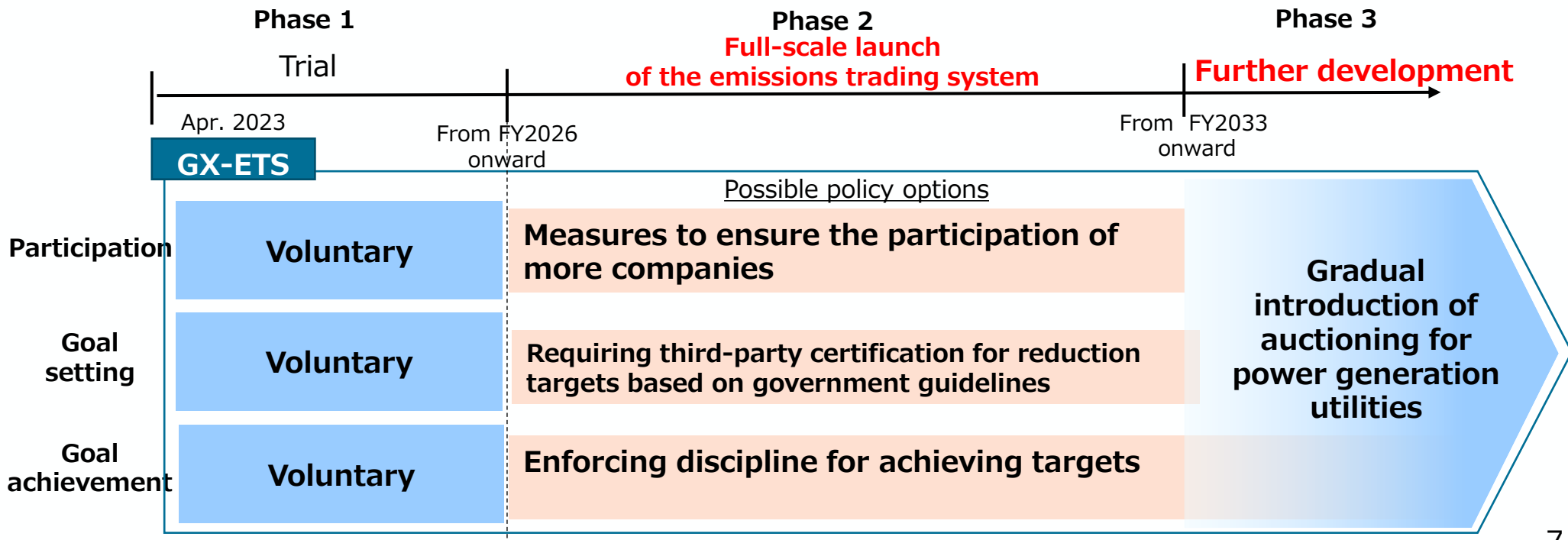
(3) Utilization of new financial methods

- Promotion of transition finance and financial support such as debt guarantees by the GX Organization, etc.



Gradual development of GX-ETS

- The **emissions trading system** was experimentally launched in FY 2023 and steered by the **GX League**, as a voluntary scheme based on members' leadership.
- As of FY 2024, **over 700 companies** are participating that account for **about 60% of Japan's emissions**.
- The ETS is to be launched **full scale from FY2026** upon introducing measures to improve fairness and effectiveness of participation, goal setting and achievement.



The Basic Concept of the Emissions Trading System in Japan

① Scope of the system

- Corporations with direct **CO2 emissions of over 100,000 tons*** *3-year-average from FY2023 to FY2025

② Transition plan

- **Submit** transition plans aimed at achieving CN by 2050

→ For example, companies will compile and publish medium- to long-term projections of direct and indirect emission reduction targets for FY2030.

③ Surrender obligation for emission allowance

- Apply for emission allowances.
- Report their emissions data verified by a third-party organization.
- Hold sufficient allowances to fully account for their annual emissions.
- Non-compliance will result in a penalty*.
* The penalty amount is equal to 1.1 times the upper limit price.

④ Price Stabilization ~Setting the Price Corridor~

- Set the Price Corridor: The government will **set upper and lower limit** prices for emission allowances.

Upper limit ↑ Companies are exempt from holding emission allowances if they pay the government an amount equivalent to the upper limit.

lower limit ↓ GX Acceleration Agency purchases emission allowances through a reverse auction.

⑤ Emission trading market

- GX Acceleration Agency establishes the emission trading market.
- Financial institutions and trading firms can also participate if they meet certain conditions such as extensive experience in trading carbon credits.

2. Regulated Entities

Approaches for Determining Target Entities

- In general, emissions trading schemes involve administrative procedures such as verification and compliance, which create certain regulatory costs. Therefore, the scope is typically limited to facilities or companies with significant emissions.
- In the EU and the UK, facilities with direct emissions of 25,000 tons or more are covered. In South Korea, companies with combined direct and indirect emissions of 125,000 tons or more are subject to the scheme.
- In Japan, to ensure consistency with existing energy and environmental laws (such as the Energy Conservation Act and the Global Warming Countermeasures Act) and the GX League's company-level approach, the system will apply at the business entity level. To capture emission sources of similar scale to those in other countries, the threshold will be set at 100,000 tons of direct CO₂ emissions (average over the past three fiscal years).
- This will result in approximately 300–400 companies being subject to the scheme, covering nearly 60% of Japan's greenhouse gas emissions.

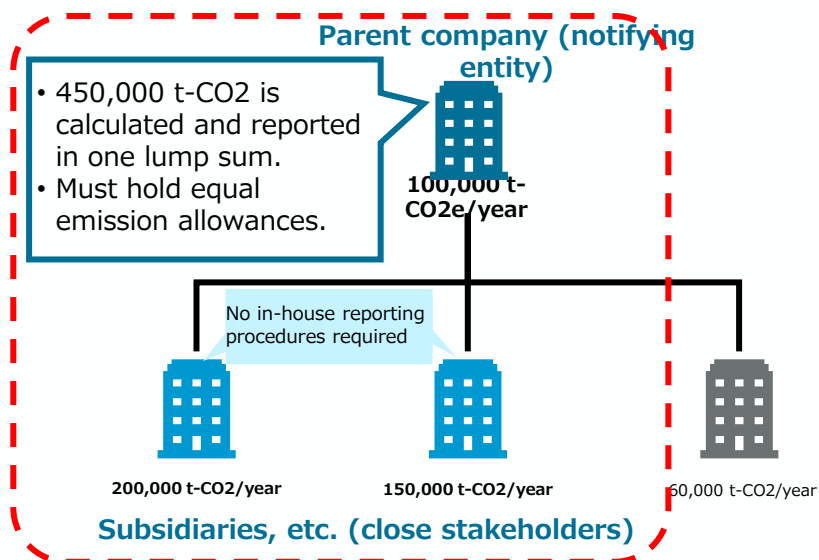
Comparison of Emissions Trading Systems

	EU	UK	Korea
Unit	Installation	Installation	Corporation
Threshold	About < 25,000 t-CO ₂ (direct emissions)	About < 25,000 t-CO ₂ (direct emissions)	≤ 125,000 t-CO ₂ (Direct and indirect emissions)

Joint submission with close stakeholders

- In the GX League, about 40% of participating companies set reduction targets and calculate emissions on a group basis, including for their subsidiaries.
- Taking this into account, **the Amended GX Promotion Act permits entities that make GX investments with other close stakeholders to jointly submit emission targets and related information** with those stakeholders.
- **The definition of close stakeholders** will follow the scope (*1) permitted under the Energy Conservation Act for group reporting and recognize subsidiaries and affiliates under the Companies Act.
- Since this system targets relatively large entities with direct emissions of 100,000 tons or more, there will **be cases where the parent company is not covered**. To enable compliance on a group basis in such cases, **sibling companies** will also be included.

Integrated Compliance with the System



Requirements for “Close Stakeholders”

- Have a close relationship with the business operator that intends to make the notification.
 - **Subsidiaries and affiliates**
 - Subsidiaries with the same parent company (so-called **sibling companies**)
- Direct emissions must be **more than 100,000 tons**.
- The company must have plans to invest in an integrated manner.

Joint notification

Response of the Notifying Entity

- If the requirements for a close stakeholder are met, the parent company, etc. shall collectively perform the following:
 - (1) **Filing a notification to receive allowance allocation**
 - (2) **Calculation, confirmation, and reporting of actual emissions**
 - (3) **Fulfillment of emission allowance obligations**
 - (4) **Formulation of transition plans**

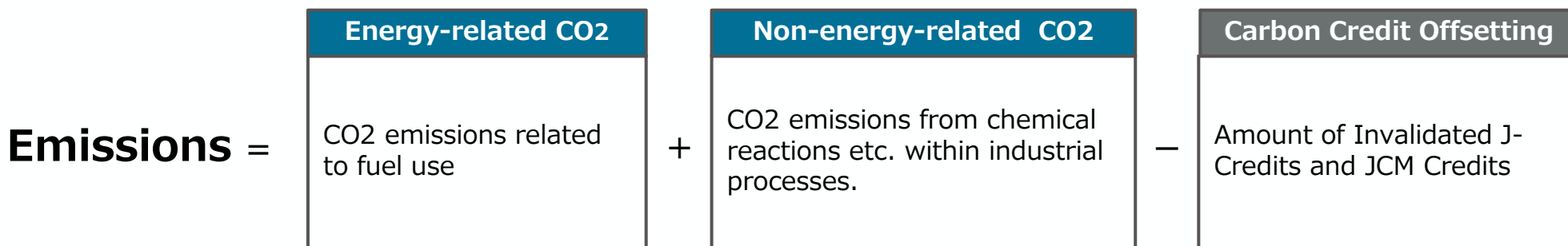
[ref.] Definition of subsidiaries and affiliates

	Underlying Laws and Regulations	text
Subsidiary Company	<u>Companies Act</u> Article 2, Item 3	(Definitions) "Subsidiary Company" means any entity which is prescribed by Ministry of Justice Order as a corporation the management of which is controlled by a Company, including, but not limited to, a Stock issuing Company in which a majority of all voting rights are owned by the Company.
	<u>Regulations for Enforcement of the Companies Act</u> Article 3, Paragraph 1	(Subsidiary Companies and Parent Companies) An entity prescribed by Ministry of Justice Order as provided in Article 2, item (iii) of the Act is a second company, etc. if the first company as provided in that item controls determinations on the financial and business policies of the relevant second company, etc.
Affiliated Company	<u>Ordinance on the Terminology, Forms, and Preparation Methods of Financial Statements, etc.</u> Article 8, Paragraph 5	(Definitions) The term "Affiliated Company" as used in this Ordinance means, where a Company, etc. or its Subsidiary Company is able to exert a significant influence on the financial and operational or business policy decisions of a non-Subsidiary Company, etc., due to their ties in terms of investment, personnel, funds, technology, transactions, etc., the relevant non-Subsidiary Company, etc..

3. Calculation of emissions

Calculation of actual emissions

- Under the new GX-ETS, calculations and reports will be required for energy-related CO2 and non-energy-related CO2 directly emitted by the regulated entity (so-called Scope 1).
- Activities subject to calculation will be determined in line with the Act on the Rational Use of Energy and the SHK system based on Act on Promotion of Global Warming Countermeasures.



- ※ CO2 emissions related to transportation are also subject to calculation. The scope of emissions required for calculation and reporting shall be determined based on the provisions of the Act on the Rational Use of Energy Act on Promotion of Global Warming Countermeasures.
In addition, other countries have taken measures to exclude shipping routes and businesses related to remote islands from the scope of emissions calculated by target operators. These measures are also stipulated in subordinate laws and regulations, referring to examples from other countries.
- ※ Credits are a means of enabling the fulfillment of obligations through transactions in the same way as emission allowances, and from the perspective of treating both equally, the amount of credit invalidation is not deducted for emissions that are subject to the system (whether the direct emissions are 100,000 tons or more) or when calculating the standard emissions and benchmark levels.
- ※ The treatment of CCUS and forest absorption will be considered in the future, considering the status of discussions under the SHK system and the development of procedures for verification by third parties.

Types of calculation methods

- To ensure accurate calculation by covered entities, it is necessary **to define the calculation methods that are permitted under the system.** This scheme will **allow four methods (1–4), considering the calculation approach under the SHK system and alignment with international rules.**
- If, in exceptional cases, **the required evidence for calculation cannot be obtained** and **methods 1–4 cannot be applied**, an alternative approach will be established. This will **involve estimating emissions conservatively based on past emission records or data from industry peers** in order to determine the compliance obligation.

Calculation method		Calculation Formula	Details
1	Activity level × emission factor	Activity level (fuel consumption, etc.) × emission factor	<ul style="list-style-type: none"> Activity data obtained from purchase slips or measuring instruments Emission factors specified in subordinate regulations (default values) may be used, but alternatives are also permitted
2	Mass balance	(Amount of carbon in raw materials - amount of carbon in products) × 44/12 *1	<ul style="list-style-type: none"> Measure carbon content in raw materials and products to calculate emissions
3	Direct measurement (concentration × flow rate)	CO ₂ concentration × flue gas and other flow rates	<ul style="list-style-type: none"> Measure CO₂ concentration continuously or by sampling and multiply by flow rate
4	Other	Model calculations Ex) $\text{CaC}_2 + 2\text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2 + \text{C}_2\text{H}_2$ (+ $2\text{O}_2 \rightarrow 2\text{CO}_2$)	<ul style="list-style-type: none"> Calculate theoretically using chemical formulas
	Fixed quantity × time	Machine specifications × machine operating hours (h/day) × operating days	<ul style="list-style-type: none"> Determine activity level or emissions based on specification values
Exc.	Conservative projections	Historical data × 1.075 *2 etc.	<ul style="list-style-type: none"> If emissions cannot be calculated using the above methods due to unavoidable reasons, emissions are conservatively estimated based on historical data, etc.

*1 Molecular weight of carbon dioxide / Atomic weight of carbon

*2 To prevent creating an incentive for entities to claim difficulty in calculating actual emissions for a given year—when activity levels and emissions have increased within the 7.5% adjustment threshold compared to past performance—the coefficient applied to past emissions data will be set at 1.075.

[ref.] Accuracy of Measuring Equipment

- When measuring fuel consumption and similar data, it is desirable that the instruments used ensure a certain level of accuracy.
- Under this ETS system, target accuracy levels for each type of instrument will be defined based on the calculation rules of the GX League. To promote proper management, covered entities will be required to report information on the accuracy and maintenance status of the measuring instruments they use (including inspection methods and frequency), along with the emissions.
- Furthermore, after the system is launched, these requirements will be reviewed as needed, taking into account the measurement practices.

Required accuracy of measuring equipment according to GX league calculation rules.

Types of activities	Types of fuels and raw materials	Activity level (X)	Required accuracy (instrument tolerance)
Use of solid fuels	Coke, etc.	$1,000 \text{ t} \leq X$	\pm within 2.0%
		$100 \text{ t} \leq X < 1,000\text{t}$	\pm Within 3.5%
		$X < 100 \text{ t}$	\pm within 5.0%
Use of liquid fuels	A heavy oil, B and C heavy oil, kerosene, diesel oil, gasoline, etc.	$5,000\text{kl} \leq X$	\pm within 2.0%
		$500 \leq X < 5,000 \text{ kl}$	\pm Within 3.5%
		$X < 500\text{kl}$	\pm within 5.0%
Use of gaseous fuels	City gas	No Classification	\pm within 5.0%
		$2,500 \text{ km}^3 \leq X$	\pm within 2.0%
	LPG (gas)	$250 \text{ km}^3 \leq X < 2,500 \text{ km}^3$	\pm Within 3.5%
		$X < 250 \text{ km}^3$	\pm within 5.0%
	LPG (liquid)	$5,000 \text{ t} \leq X$	\pm within 2.0%
		$500\text{t} \leq X < 5,000\text{t}$	\pm Within 3.5%
LNG (Liquid)	$X < 500\text{t}$	\pm within 5.0%	
	$5,000 \text{ t} \leq X$	\pm within 2.0%	
	$500 \text{ t} \leq X < 5,000 \text{ t}$	\pm Within 3.5%	
Use of electricity	electric power	$X < 500 \text{ t}$	\pm within 5.0%
		$90 \text{ Million kWh} \leq X$	\pm Within 1.0%
		$4.5 \text{ MkwH} \leq X < 90 \text{ MkwH}$	\pm within 2.0%
Use of heat	Industrial steam, hot, cold and steam	$X < 4.5 \text{ MkwH}$	\pm Within 3.5%
Burning of waste, etc.		No Classification	\pm within 5.0%
Industrial Processes		No Classification	\pm within 5.0%

Accounting for Carbon Credits

- To encourage price formation of emission allowances and maintain incentives for reductions among scheme participants, this system will also set a cap on credit usage.
- The cap will be set at 10% of actual emissions, reflecting international practice where limits are gradually tightened as systems mature.
- Furthermore, the impact on the supply-demand balance of allowances will be continuously monitored after the system launch, and the cap will be reviewed as necessary.

Credits that can be used under this program

- **J-Credits**
- **JCM Credit**

※ The JCM credits that can be used comply with the SHK system (in SHK, JCM credits derived from initiatives before 2020 cannot be used unless the requirements such as the date of issuance are met).

Maximum usage

- **10% of emissions in each year**
(emissions before deducting the amount of invalidated credit)

[ref.] Upper limit on the use of credit in other countries

- Carbon credits play an important role in **promoting emission reductions by a wide range of actors including those outside the ETS system** and in **recognizing early efforts related to removal and sequestration**.
- At the same time, concerns have been raised that the use of credits **may affect the supply–demand balance of allowances and hinder appropriate price formation**.
- In many jurisdictions, in order to limit the impact on the supply–demand balance of emission allowances, caps are placed on the percentage of credits that regulated entities are permitted to use. These caps are commonly set at **around 5–10%** of an entity’s compliance obligation and **are reviewed periodically**.

Country/ Region	Eligible Credits		Usage limit, etc.
	Domestic	International	
EU	×	×	<ul style="list-style-type: none"> • Phase 1 (2005–2007): Credit use permitted. • Phase 2 (2008–2012): Country-specific limits on credit use introduced. • Phase 3 (2013–2020): An EU-wide cap on credit use introduced (equivalent to 11% of Phase 2 allocation). • Phase 4 (2021–2030): Use of external credits discontinued. • Currently examining potential approaches for handling removal and sequestration within the emissions trading system.
California, USA	○	×	Credits may be used up to the following limits <u>relative to the surrender obligation</u> : <ul style="list-style-type: none"> • 2013-2020: 8% • 2021-2025: 4% • 2025~: 6%
Korea	○	○	Credits may be used up to the following limits <u>relative to the surrender obligation</u> : <ul style="list-style-type: none"> • 2015 – 2020 : 10% • 2021 – 2025 : 5%

*In the EU-ETS, **approximately 1.5 billion tons of low-priced external credits were used between Phase 1 and Phase 3**, resulting in a surplus of emission allowances (up to approximately 1.7 billion tons (as of 2017), and a surplus of 1.15 billion tons as of 2024 (total annual quota in 2023 was approximately 1 billion tons, emissions are 1 billion tons). It has been pointed out that it contributed to this.

[ref.] Significance of Using Removal and Absorption Amounts as Evaluation Metrics

- Under the J-Credit Scheme, the scope of eligible projects will be expanded to promote advanced initiatives such as DACCS.
- Similarly, under the Joint Crediting Mechanism (JCM), methods will be considered for developing methodologies for technologies such as CCS.
- Credits will be positioned as a tool to incorporate removal, absorption, and storage volumes from these projects into the system.

Status of consideration

J-Credits

- The target of the J-Credit system is defined as "efforts that contribute to reducing emissions and increasing the amount of absorption recorded in Japan's greenhouse gas inventory." However, target projects will be expanded in order to preemptively evaluate efforts such as carbon absorption and removal that have not yet been recorded in the GHG inventory.
- Currently, we are considering the formulation of methodologies for DACCS and other projects.

J-Credit System Implementation Guidelines (excerpt)

- ✓ Initiatives which contribute to the reduction of emissions recorded in Japan's GHG inventory
- ✓ Initiatives which contribute to increasing the amount of absorption recorded in Japan's GHG inventory
- ✓ **Initiatives discussed at the following government-hosted study committees and are selected by the system administrators:**
- ✓ **A) Study Group on Greenhouse Gas Emissions Calculation Methods (Ministry of Environment)**
- ✓ **B) Study Group for the Creation of a Negative Emission Market (Ministry of Economy, Trade and Industry)**

*(Revised at the 34th Steering Committee Meeting (March 29, 2024))

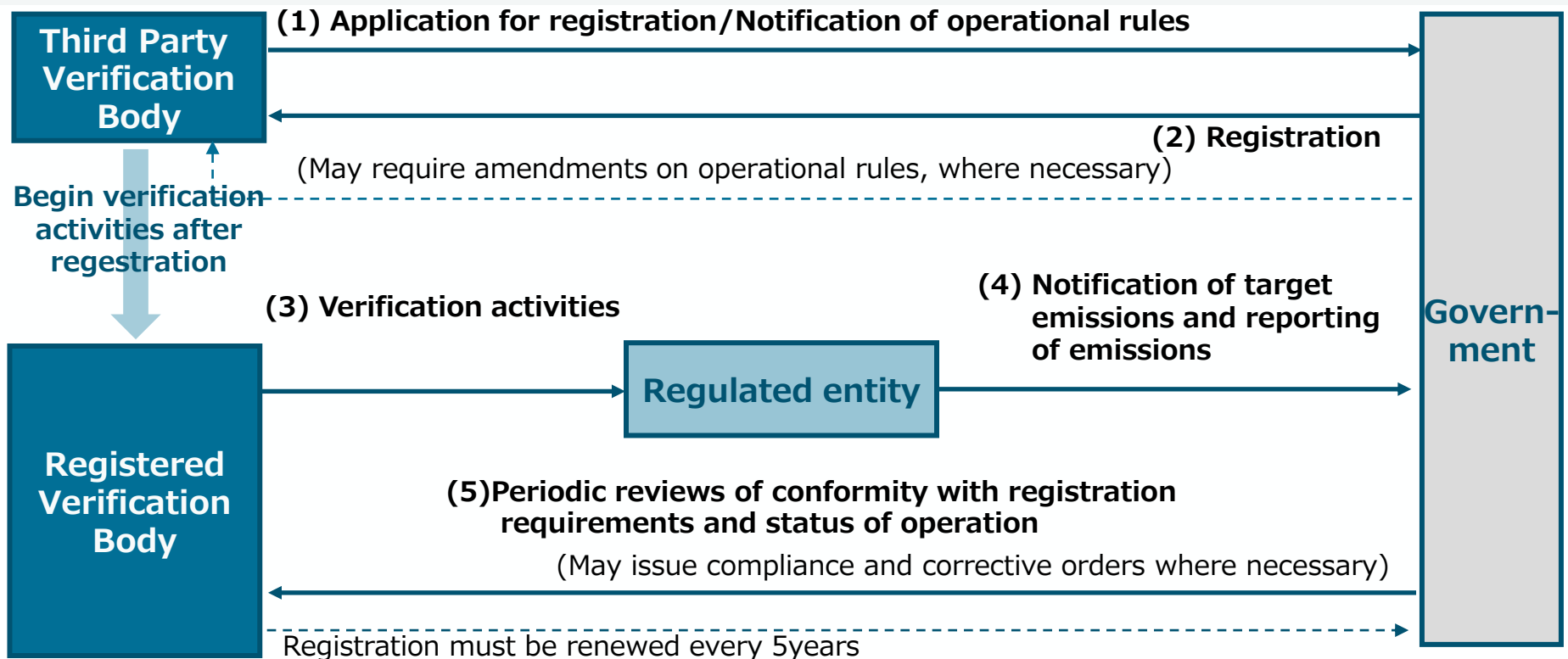
JCM

- Japanese government is supporting the feasibility study of a CCS project in Indonesia (a reduction CCS project which captures and injects CO₂ emissions from oil and natural gas production facilities).
- At the same time, we are reviewing the rules and systems for implementing CCS-related projects within the JCM framework.

4. Registered Verification Bodies

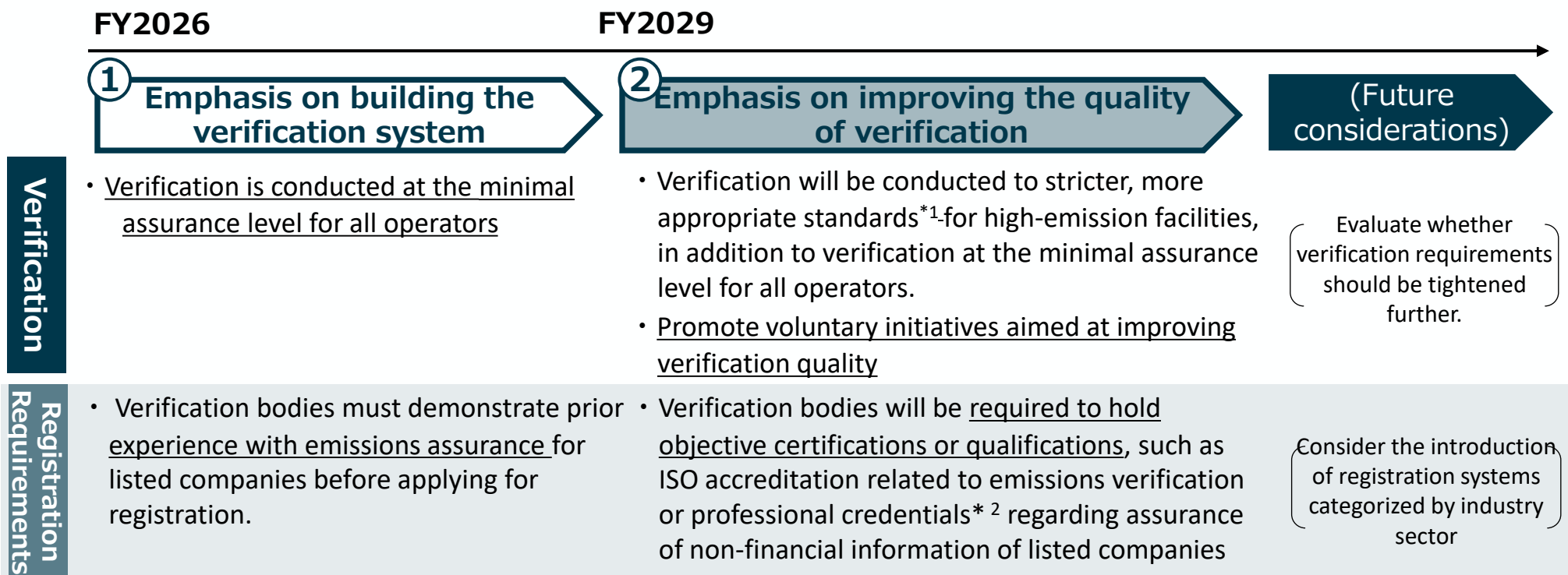
Overview: Registered Verification Bodies System

- **Entities regulated under the ETS** must obtain verification from a **registered verification body** when (1) submitting their target emissions, which serve as the basis for the allocation of emission allowances; and (2) reporting their actual emissions, which form the basis for determining their compliance obligation.
- Entities seeking to become a registered verification body **must submit an application in advance to the Minister of Economy, Trade and Industry**.
- To ensure that operations are conducted properly, METI may conduct reviews using reports from the registered verification bodies. Registration status must also be renewed every five years.



Policy direction of the system design (Phased Development)

- To ensure smooth operation of the ETS system while achieving effective emissions reductions, it is essential to secure both sufficient quantity and quality of accredited verification bodies.
- At the same time, given the current circumstances, it is most effective to first prioritize **(1) establishing the verification frame (securing the quantity of accredited bodies)** and, in parallel, on **(2) improving the quality of verification processes**.
- From this perspective, **the first three years after the launch of ETS will be designated as a focused, system-building period**, and **the system will be designed and operated with phased development in mind**.



*1 The scope of facilities may be expanded by lowering the emissions threshold, as necessary.

*2 Such as ISO 14065 accreditation (aligned with ISO 14064-1), and registration under the forthcoming system for sustainability assurance professionals for securities reports.

[ref.] Status of verification activities in Japan

- **In phase 1 of the GX League, Group G companies*1 were required to have their emissions verified by a third party. However, some companies delayed submission of verified emissions reports.**
- In addition, the **number of ISO organizations that have obtained certification related to emissions has been decreasing, but the need for verification has increased in recent years.**
- From the above, it is **possible that both regulated entities and registered verification bodies will take time to build a system** at the beginning of the ETS.

Challenges in GX League Phase 1

- ✓ In the FY2023 performance reporting—the first year of the GX League—there were notable delays in the submission of verified reports, even though only minimal assurance-level verification was required under rules.*2
- ✓ These delays stemmed from the time needed for entities to handle unfamiliar tasks and to coordinate effectively among stakeholders.

Voices of Participating Companies



Initial efforts focused on in-house training on GX League calculation rules. It took time to understand them.



We have multiple weighing instruments, and it was a challenge for us to verify the compliance of each instrument with GX League standards.

*1 Entities participating in GX League with direct emissions of 100,000 tCO2e or more in FY2021 calculated in accordance with the GX League Guidelines

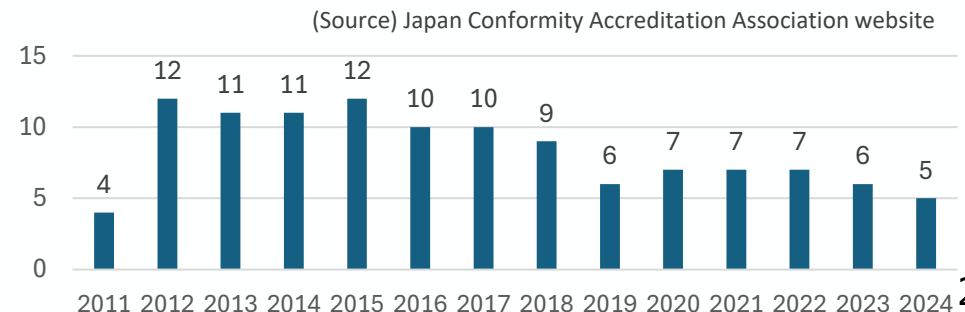
*2 The companies seeking to generate surplus reduction credits are required to undergo verification at the reasonable assurance level.

*3 J-Credit, J-VER, J-VETS, SHIFT systems, etc. require ISO 14065 certification (or application) corresponding to ISO 14064-1 or 14064-2.

Current Demands in Verification and ISO Accreditation of Verification Bodies

- ✓ Under the existing system, verification bodies are required to obtain ISO accreditation for their verification activities*3.
- ✓ The number of accredited institutions increased until around 2015 as more organizations joined the system. However, many subsequently withdrew due to factors such as limited market growth and the complexity of the system.
- ✓ Yet, the demand for verification to respond to the establishment of J-credits, disclosure of non-financial information, and the new ETS is growing.

Verification bodies with ISO certification for emissions verification



[ref.] Phased development of the EU ETS verification system

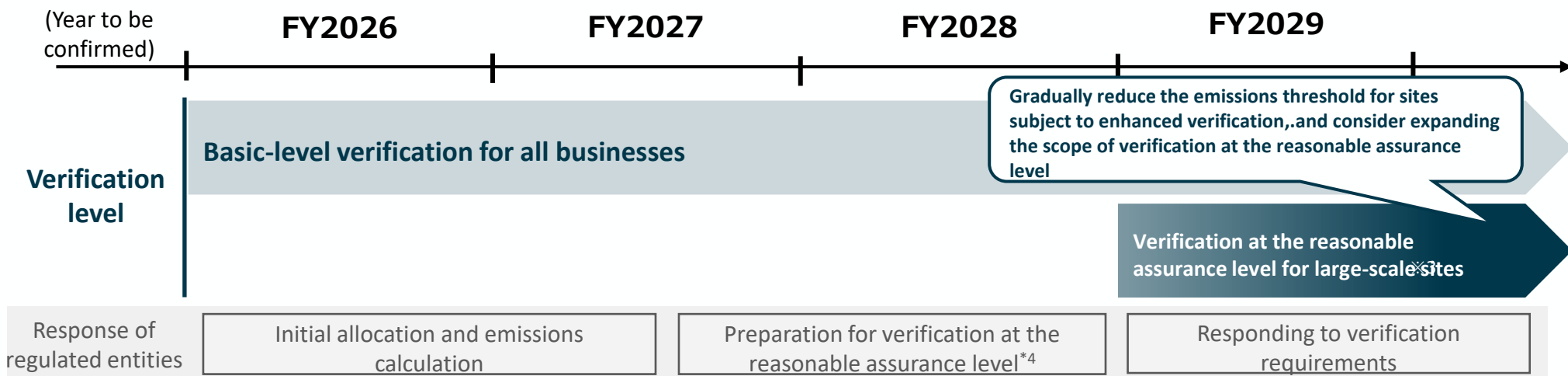
- Under the current EU-ETS, (1) operators of target facilities must undergo verification in accordance with rules set by the European Commission (EC), and (2) verification must be performed by a body accredited by the national accreditation authority under EC accreditation rules.
- Verification requirements were relatively simple when the system began in 2005 (Phase 1). Each subsequent phase has seen a refinement in the rules and processes in place.

Transition of the EU-ETS Verification System

	Phase 1 (2005-2007)	Phase 2 (2008-2012)	Phase 3 (2013-2020)	Phase 4 (2021-2030)
Rules for Verification	<ul style="list-style-type: none"> • General principles for verification methods and business processes. 	<ul style="list-style-type: none"> • The requirements for each business process became more specific, and the number of regulations increased. • Require verification to a “reasonable assurance level” • Specify the standard value of quantitative importance for emissions reporting. 	<ul style="list-style-type: none"> • Specialized regulations enforces; verification procedures subdivided; more detailed requirements introduced • Mandatory on-site visits to target facilities 	<ul style="list-style-type: none"> • Detailed development of rules, such as for the exemption of on-site visits in certain cases.
Accreditation requirements for verification bodies	<ul style="list-style-type: none"> • Verification must be conducted by a verification body recognized by the member state. • On the other hand, the only requirements required of the EC from the verification body are "independence from the subject of the system", "implementation under antional laws and EC regulations", and "understanding of laws and regulations and equipment subject to verification". Other detailed certification requirements are delegated to each country. 		<ul style="list-style-type: none"> • In the EC rules, the verification body must be certified by a national certification body. • At the time of certification, the expertise of each industry category (15 fields) is evaluated, and certification is issued for each category* <p>*Verification bodies are only allowed to perform verification activities for businesses belonging to the certified category.</p>	

Step-by-step strengthening of verification

- The reported emissions are the fundamental basis for determining an entity’s compliance obligation, and therefore it is desirable that verification—at least for the relevant portions—be conducted to a reasonable assurance level. However, this means a substantial increase in the complexity and effort involved in verification.
- **For the first three years, verification of emissions only at the limited assurance level will be required for all regulated entities. Beginning in FY2029, reasonable-assurance-level verification*¹ will be gradually introduced for large-scale facilities.**
- In Phase 1 of the GX League, both “audit-firm-based” bodies and “ISO-based” bodies conducted assurance/verification activities. For the full-scale implementation starting in FY2026, the verification rules will be designed based on the standards commonly applied by both types of bodies, thereby improving consistency and reducing the administrative burden.*²



*1 The quantitative materiality threshold for verifying at the limited or reasonable assurance level (a criterion for assessing whether emissions data contains material misstatements) is assumed to be less than 5% of the verification target.

*2 The “audit firm system” includes group companies affiliated with audit firms that are not audit firms themselves. As a common standard for both parties, ISO 14064-3 and ISSA 5000 are assumed. The concepts of limited-level and reasonable-level verification are also developed based on these standards.

*3 The threshold is determined based on the average of two consecutive years from the three years preceding the current fiscal year (e.g., the verification level for FY2029 is based on the average emissions for FY2026 and FY2027).

*4 It is assumed that procedures required for verifying at the reasonable level will be fully implemented. After consultation with the registered verification body, preparatory steps such as identifying issues and conducting a dry run will be carried out.

[ref.] Level of verification/assurance in each country

- The EU and South Korea require verification at the reasonable assurance level for all facilities. Australia requires reasonable assurance only for facilities with direct emissions of 1 million tons or more (*).
- In the future, Japan will consider the size of business establishments subject to verification at the reasonable assurance level, referencing examples from these countries.

*For facilities subject to Australia's reasonable assurance verification, the estimated coverage of emissions is about 60%. In Japan, if verification at the reasonable assurance level applies to business sites emitting more than 1 million tons, the estimated coverage would be approximately 80% of total emissions.

Overview of ETS verification systems abroad

		EU	Korea	Australia
System Target	Unit	Facility	Business Operator	Facility
	Threshold	Direct emissions of 25,000 t-CO ₂ or more	Total direct and indirect emissions of 125,000 t-CO ₂ or more	Direct emissions of 100,000 t-CO ₂ or more
Verification / Assurance Level		Verification at the reasonable assurance level	Verification at the reasonable assurance level	Verification at the reasonable assurance level ➤ <u>Facilities emitting more than 1 million t-CO₂</u> ➤ In cases where a proprietary calculation method is used

Registration requirements for verification bodies

- Registration requirements will be based on four perspectives: **basic qualifications, personnel competence, accounting foundations, and quality assurance systems**.
- Initially, the focus will be on establishing a verification frame. Later, to enhance verification quality, the design will **be as follows and will be reviewed and refined based on the status of system operation**.

(1) Basic qualifications

- ✓ Require ISO certification for emissions verification and certification for assurance of non-financial information for listed companies.^{*1}.
- ✓ During the first three years after system launch, given the time required to obtain ISO certification, verification bodies must have previous experience in emissions assurance or verification activities for listed companies^{*2} prior to applying for registration.

※1 It is expected that ISO 14065 accreditation corresponding to ISO 14064-1 will be obtained, as well as registration under the forthcoming system for practitioners of sustainability assurance in securities reports.

※2 Verification and assurance activities will be conducted based on ISO 14064-3 and ISAE 3410 standards.

(3) Accounting foundations

- ✓ Verification bodies must maintain the minimum financial stability necessary for continuous implementation of verification activities.

(2) Knowledge and skills of personnel

- ✓ Personnel must have specialized knowledge and experience in order to ensure high-quality verification, including planning, risk assessment, and risk response.
- ✓ The person responsible for verification must have practical experience related to emissions verification.

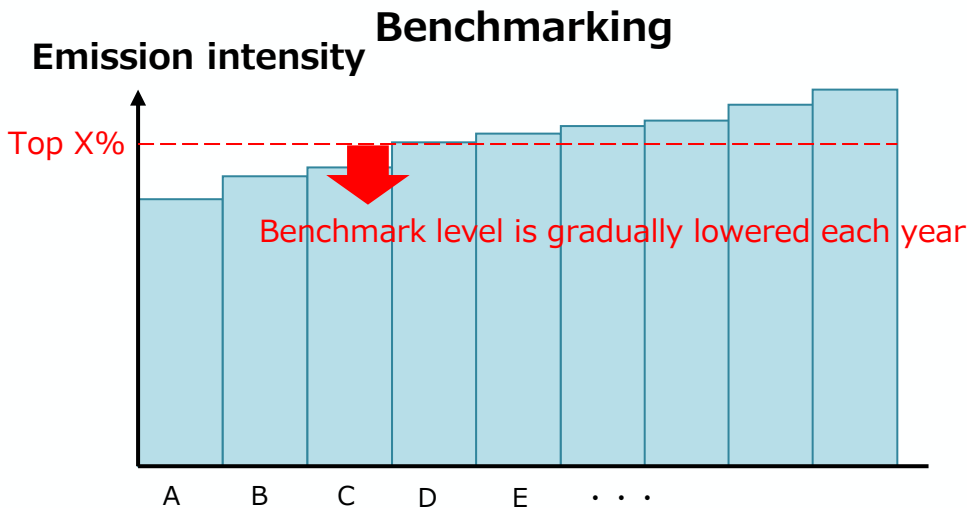
(4) In-house quality assurance system

- ✓ Internal systems must be established to ensure technical competence for verification as well as fairness and independence in operations.

5. Allocation Based on Benchmarking and Grandfathering

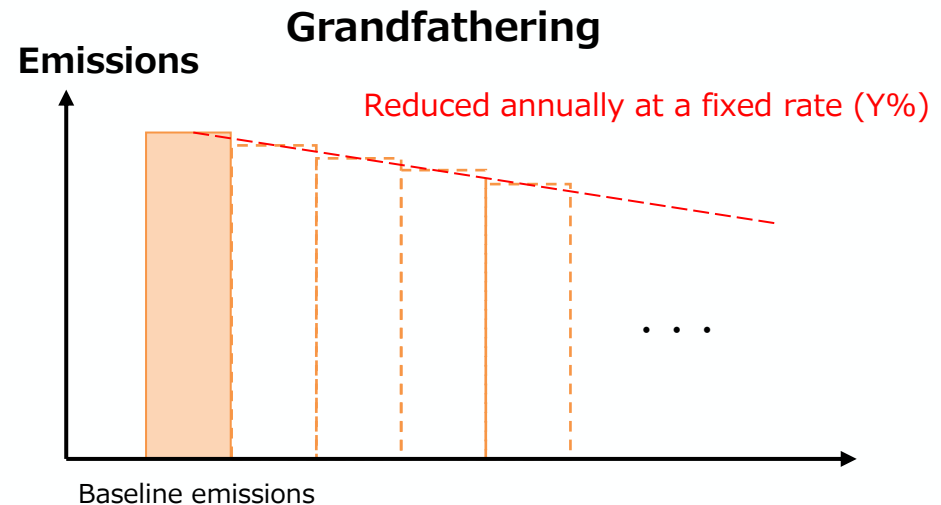
Benchmarking and Grandfathering

- To account for industry-specific characteristics, benchmarks are **set primarily for energy-intensive sectors**. Allocation amounts for entities are then calculated based on these benchmarks.
- For each industry, the benchmark level is determined by comparing companies' emissions intensity per unit of output. The benchmark is set at the performance level of the top X% within the industry, **thereby accounting for the industry-specific situations in the adoption of alternative technologies, etc.**
- For industries where setting benchmarks is difficult**, allocation will be based on **the grandfathering method, which applies a certain reduction rate to the emissions of a baseline year.**



- The benchmark value is set at the the emission intensity of the top X% level (*) within the same industry.
- The allocation is calculated by multiplying the benchmark with the benchmark of the baseline activity level (average production, etc. over the three years before the introduction of the ETS, i.e. FY2023 ~ FY2025).

$$\text{Allocation} = \text{Baseline activity level} \times \text{Target emission intensity for each year}$$

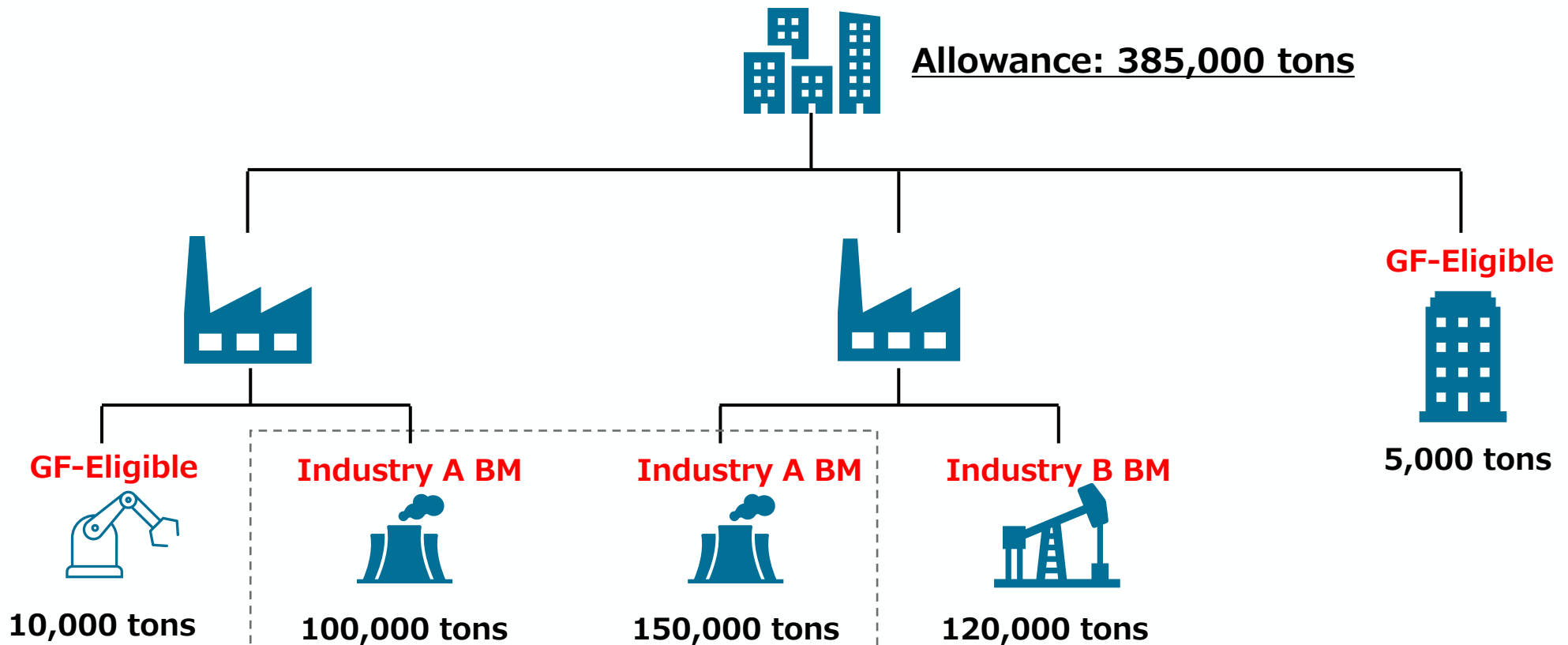


- Emission allowance decreases at a certain rate each fiscal year, based on past emission levels.
- The allocation is calculated by multiplying the baseline emissions (average emissions over the three years before the introduction of the ETS i.e. FY2023~FY2025), with a certain reduction rate.

$$\text{Allocation} = \text{Baseline emissions} \times (1 - \text{Target reduction rate} \times \text{years since the baseline})$$

Calculating Allocations for the Regulated Entities

- The total amount of emission allowance allocated to each entity regulated in the ETS will be calculated by summing the allowances for each benchmark-covered process and each grandfathering-covered process at each of the entity's facilities, and then applying adjustments based on relevant consideration factors.



*Calculated separately even when the same BM is applied.

5-1. Calculation of Baseline Activity Levels and Baseline Emissions

Baseline Period for Calculating Baseline Activity Levels and Baseline Emissions

- Emissions and activity levels are affected by fluctuations in economic activity and other factors and **therefore may vary by fiscal year**.
- In order to mitigate the impact of such fluctuations, **it is desirable to calculate** baseline activity levels and baseline emissions **as an average over multiple fiscal years**.
- In other countries' ETS systems, a 3-to-5-year average is commonly used as the baseline. However, extending the calculation period increases the data collection burden on companies. Considering that many businesses have already calculated and verified their emissions during Phase 1 of the GX-ETS (FY2023–2025), the baseline period under the new system will be set as the three fiscal years immediately preceding participation in the system (FY2023–2025 for entities joining in FY2026).

EU-ETS	K-ETS
5-year average or median(*)	3-year average (*)
*Baseline periods by phase: Phase 4 (2021-2025): 2014-2018 Phase 4.5 (2026-2030): Median of 2019-2023	*Calculated from the three years prior to the beginning of each compliance period

[ref.] GX2040 Vision (excerpt)

GX2040 Vision (Cabinet decision in February 2025)

(2) Institutional measures toward the realization of growth-oriented carbon pricing

1) Full-scale operation of the ETS

① Basic approach

c) Method of allowance allocation

i) Standards for reflecting sectoral characteristics, etc.

In implementing free allocation, allocation amounts shall, in principle, be determined based on **sector-specific benchmarks**, particularly for energy-intensive sectors where it is especially important to consider industry characteristics. Benchmarks focus on specific emission-related activity processes and require the emissions intensity within those processes to be kept within specified levels. For processes subject to benchmarks, allocation amounts will be calculated by multiplying the benchmark emissions intensity with the baseline activity level, which is defined **as the average activity level over the three fiscal years immediately preceding the start of the system (FY2023–FY2025)**. On the other hand, there are sectors for which it is difficult to establish benchmarks for technical reasons. For such sectors, **grandfathering** will also be applied, whereby allocation amounts are calculated by multiplying baseline emissions levels (**the average emissions over the three fiscal years immediately preceding the start of the system**) by a certain ratio (reduction rate).

5-1①. Accounting for Structural Changes in the Three Fiscal Years Immediately Preceding the Start of the System

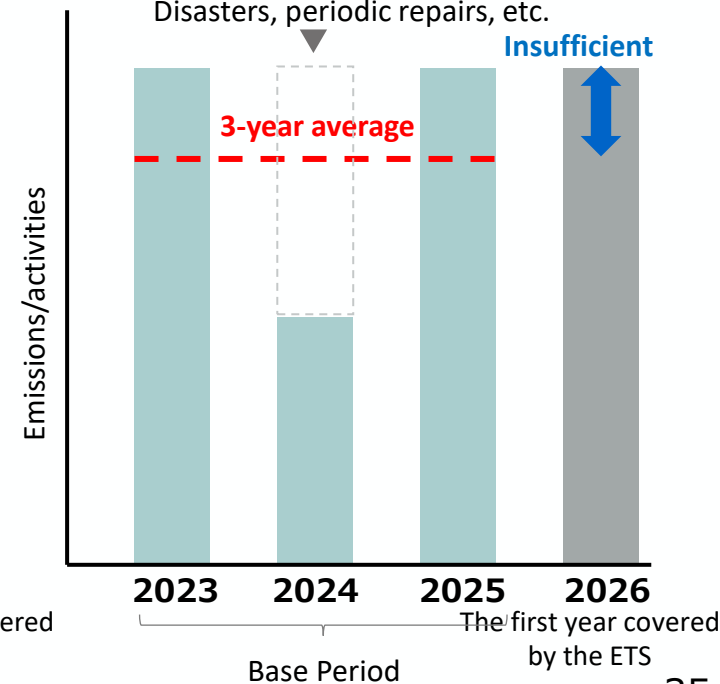
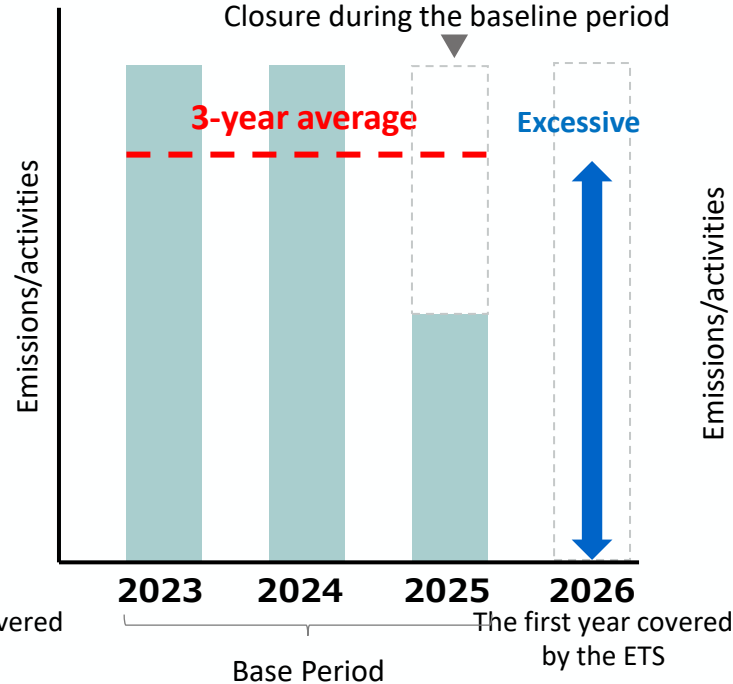
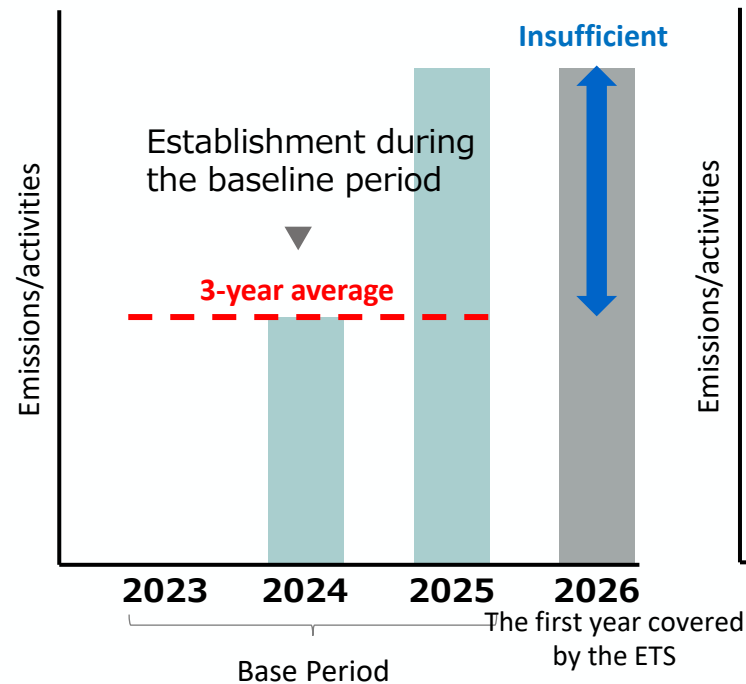
Considerations in Calculating Baseline Emissions and Baseline Activity Levels

- Calculating baseline activity levels (benchmarking) or baseline emissions (grandfathering) as a simple three-year average could lead to either excessive or insufficient allocations. This can occur **in cases such as the establishment or closure of a facility during the period, or reduced activity due to unavoidable circumstances such as disasters or mandatory inspections.**
- From the perspective of fair allocation, it is necessary to establish rules for how such cases should be handled.

(1) Establishment of a new facility

(2) Closure of a facility

(3) Reduced operation due to responses to disasters or legal mandates



Methods for Calculating Baseline Activity Levels and Emissions in Each Case

- **For newly established facilities**, the baseline shall be calculated **as the average of the period since establishment. Facilities closed during the baseline period shall be excluded from allocation.**
- **In cases of disasters or mandatory inspections**, baseline activity levels and emissions shall be calculated based on the average excluding the affected period.

(1) Facility establishment during the baseline period

- **Baseline values shall be calculated as the average starting from the fiscal year following the establishment.**
- **For the purposes of the calculation of allowances**, post-establishment **activity levels and emissions shall be annualized in cases where the new establishment occurs in the final year** of the baseline period.

(2) Closure of facility during the baseline period

- **Facilities closed during the baseline period shall be excluded from baseline calculations.**

(3) Reduction in activities and emissions due to disasters

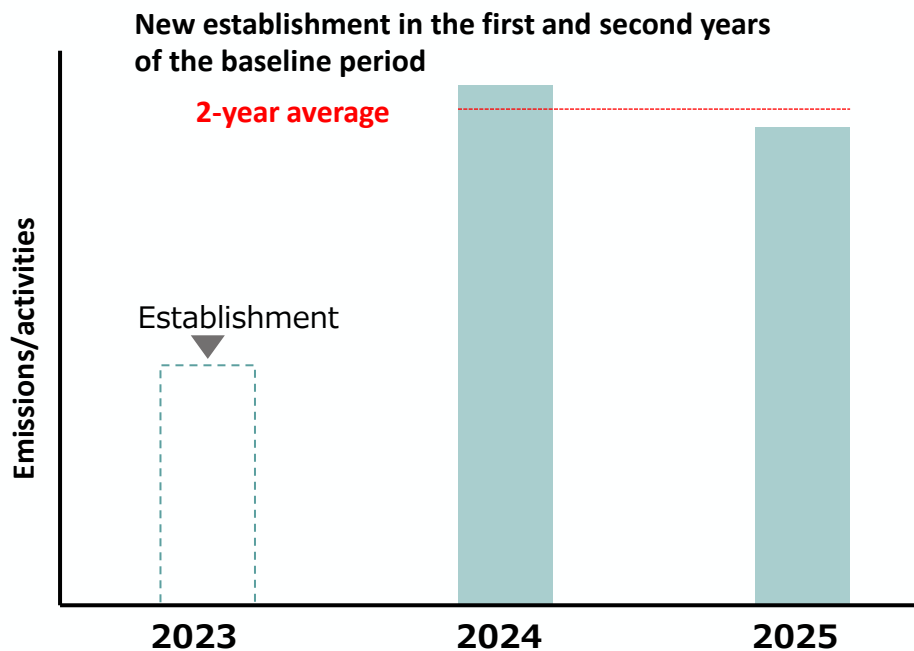
- **For facilities in areas designated under the **Special Severe Disaster Act, Severe Disaster Act, or Disaster Relief Act**, the **three-year average may be calculated by deeming the activity/emissions of the affected fiscal year (within the designated period) to be the same as the previous year.****

(4) Reduction in activity/emissions due to legally mandated safety inspections

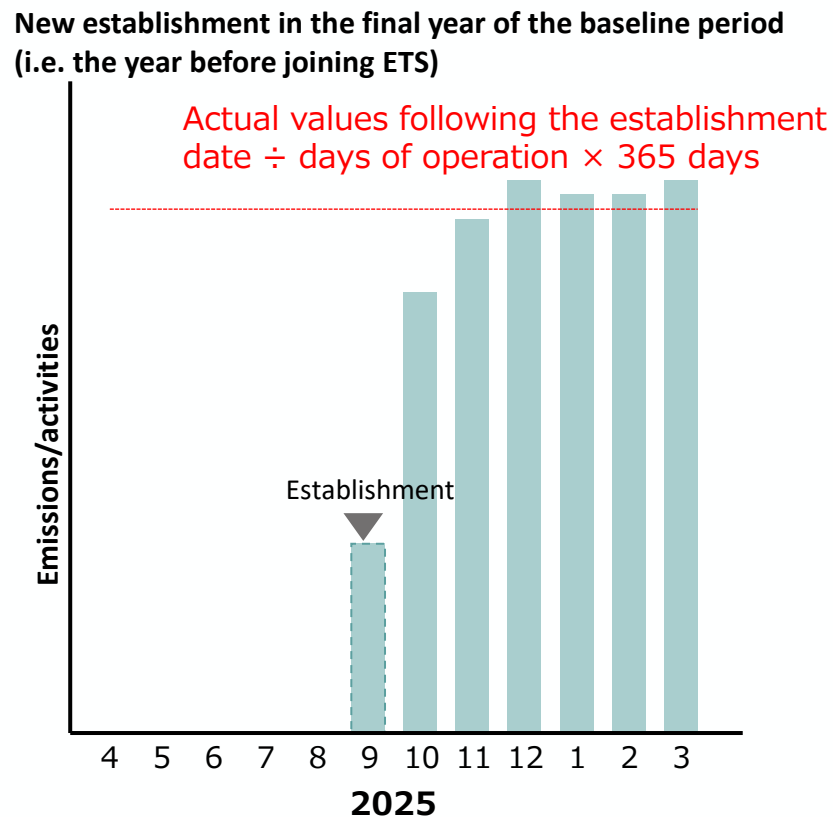
- **For facilities suspending operations for inspections under the **High-Pressure Gas Safety Act**, average activity/emissions may be calculated based on past **operational performance excluding the five months prior to inspection completion.****

[ref.] Calculation in the Case of Newly Established Facilities

- For facilities newly established during the baseline period, the average value after the year of establishment shall be used as the baseline.
- For facilities newly established in the final fiscal year of the baseline period (the third year), baseline activity levels and emissions shall be calculated by multiplying the daily emissions (or activity levels) from the date of establishment, by 365.

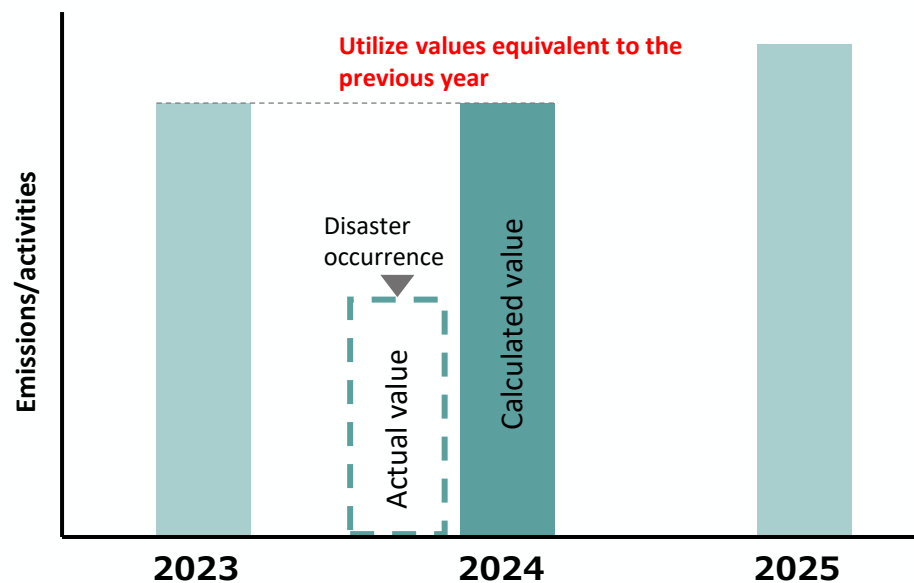


	2023	2024	2025	average
Activity and emissions (actual)	60	110	100	90
Activity and emissions (calculated)	-	110	100	105



[ref.] Calculation in the Case of Disasters

- For entities under the performance-based allocation system, allocations may be insufficient if business activities were temporarily suspended due to disasters. Thus, when calculating baseline activity levels and baseline emissions, facilities located in areas designated under **the Special Disaster Measures Act, the Severe Disaster Relief Act, or the Disaster Relief Act**, may disregard actual activity levels and emissions during the designated disaster period, and utilize values equivalent to those in the previous fiscal year.



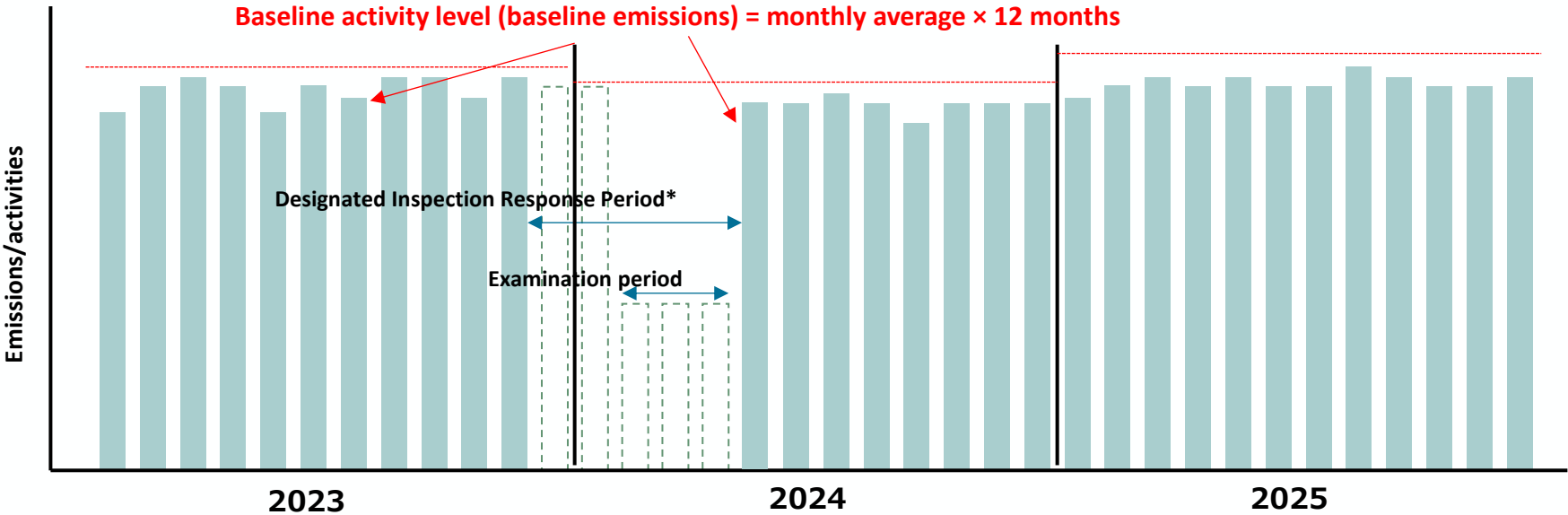
	2023	2024	2025	average
Activity and emissions (actual)	100	55	115	90
Activity and emissions (calculated)	100	100	115	105

[ref.] Overview of each law

	Overview	Disasters that have been designated
Special Disaster Measures Act (Act on Special Measures for Large-Scale Disasters)	Designates a disaster as a "large-scale extraordinary disaster" when it is deemed an "extremely abnormal and severe extraordinary disaster" and recognized as necessary to take measures to protect the administrative rights and interests of victims.	<ul style="list-style-type: none"> Great East Japan Earthquake Typhoon No.19 in 2019 Heavy rain in July 2, 2020 Noto Peninsula Earthquake, etc
Severe Disaster Relief Act (Act on Special Financial Support to Deal with Extremely Severe Disasters)	Designates a disaster as an "extremely severe disaster" when it is deemed necessary to alleviate the fiscal burden on local governments or provide special financial support to victims. Specifies special national subsidies for applicable disaster recovery projects.	<p>The following disasters are designated in addition to the above disasters:</p> <ul style="list-style-type: none"> Heavy rain in August 2021 Storm of Typhoons No.14 and No.15 in 2022
Disaster Relief Act	Enables prefectural governors to apply the Act to provide urgent and necessary relief to victims, protect them, and maintain social order within affected municipalities.	<p>The following disasters (example), in addition to the above disasters:</p> <ul style="list-style-type: none"> Heavy snowfall from January 7 2021 Power outage due to the influence of Typhoon No. 6 in 2023

[ref.] Calculation in the Case of Safety Inspections

- Since safety inspections under the High-Pressure Gas Safety Act are generally completed within about six months each fiscal year, for the purposes of allowance calculation, the period excluding the five months prior to the resumption of normal operation will be treated as the inspection period. The average will be calculated based on this adjusted period.
- Specifically, for years in which safety inspection are conducted, the activity level (or emissions) will be calculated as the average for months excluding the designated period \times 12 months and then averaged over three years.



※ Self-inspection is permitted for businesses which are granted special provisions under the High-Pressure Gas Safety Act. In this case, a notification must be submitted to the prefectural governor or equivalent authority once the inspection is completed. However, there is no requirement for a notification to be made at the start of the inspection, thus the start date cannot be precisely identified in these cases. This is why the five months prior to completion will uniformly be excluded from the calculation of the average.

5-1(2). Accounting for Structural Changes After the Start of the System

Accounting for Establishment and Closure of Facilities and Fluctuation in Activity Levels

- To ensure that the introduction of the ETS does not prevent entry into new businesses or business expansion necessary for achieving GX, nor discourage the expansion of business activities, **allocation amounts shall be adjusted** in the case of **facility establishments, closures, and changes in activity levels**.

Approaches considered in the Special WG for Carbon Pricing for the Realization of GX

New Establishment of Facilities	<ul style="list-style-type: none">• When new facilities are established, additional allocations shall be granted from the following fiscal year onward, based on actual emissions or activity levels, in accordance with the standards for benchmarking/grandfathering
Closure of Facilities	<ul style="list-style-type: none">• When facilities are closed, the portion of allowances corresponding to the post-closure period shall be deducted from the next year's allocations.※ No allocation shall be made for the closed facility from the following fiscal year onward.
Increase or decrease in activity level	<ul style="list-style-type: none">• When a facility's activity level increases or decreases beyond a certain threshold, allocation amounts shall be adjusted from the following fiscal year onward, based on the average of the previous two fiscal years and accounting for the magnitude of the change.※ Adjustments shall apply only where activity level changes are deemed to represent structural changes, rather than temporary fluctuations.

[ref.] GX2040 Vision (excerpt)

GX2040 Vision (Cabinet decision in February 2025)

(2) Institutional measures for the realization of the growth-oriented carbon pricing concept

1) Full-scale operation of ETS]

① Basic approach

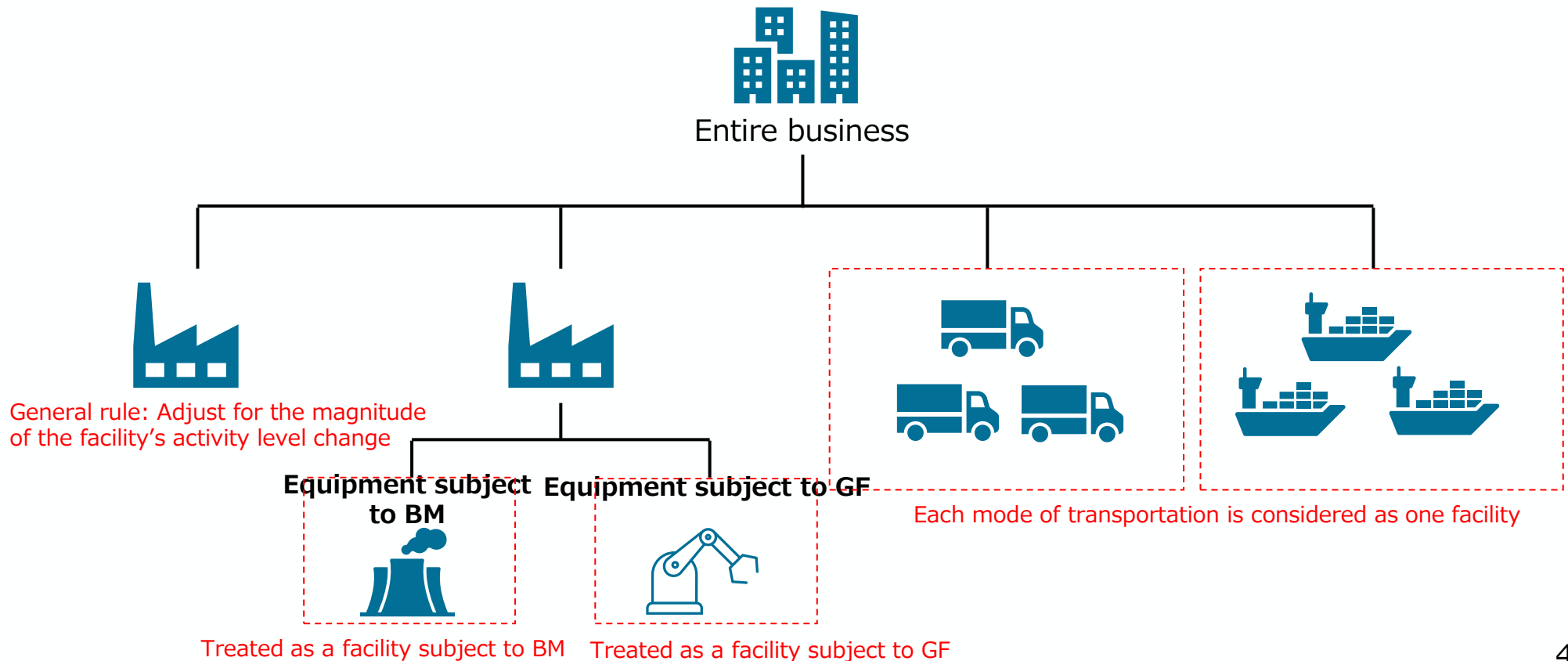
c) Method of allowance allocation

i) Standards to accounting for industries, etc.

In order to prevent the introduction of Emission Trading System from discouraging entry into new businesses and business expansion necessary for the realization of GX, or discouraging business activities, **in the event of a new establishment, closure, or change in the activity level (when the activity level at the facility averaged over two fiscal years increases or decreases at a magnitude beyond a certain threshold)**, etc., allocation will be adjusted based on the aforementioned standards for benchmarking/grandfathering.

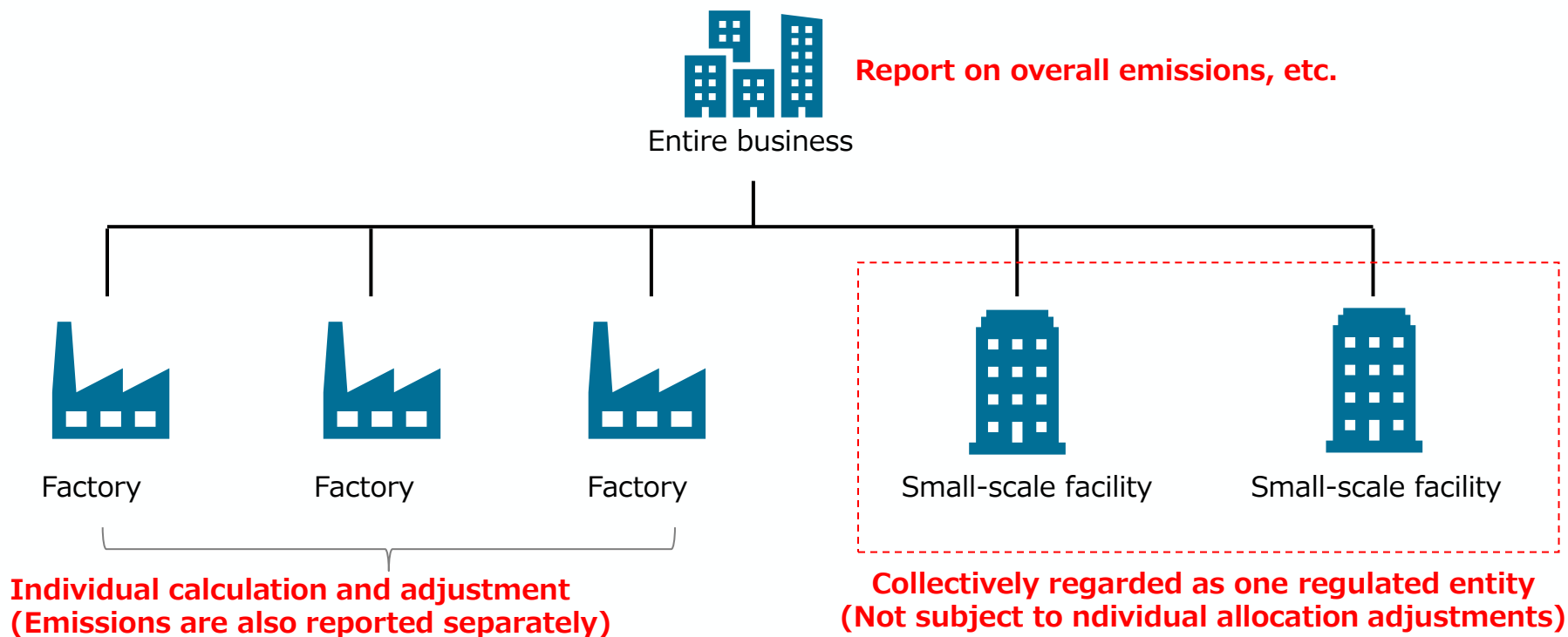
Unit of allocation adjustment

- Generally, allocation will be adjusted when there is a change in the activity level (new establishment, abolition, increase or decrease in the activity level, etc.) at each facility
- However, if equipment subject to BM and GF coexist in a facility, independent adjustments will be made for each piece of equipment.



Adjustments for Small-Scale Facilities

- **For facilities with energy consumption of less than 1,500 kL (※), to simplify reporting and enforcement procedures, individual activity-based adjustments shall not be conducted.**
- Such facilities shall instead **be treated collectively as a group of small-scale facilities.** **Allocation adjustments shall be made only when the total activity level of the group changes by ±7.5% or more.**

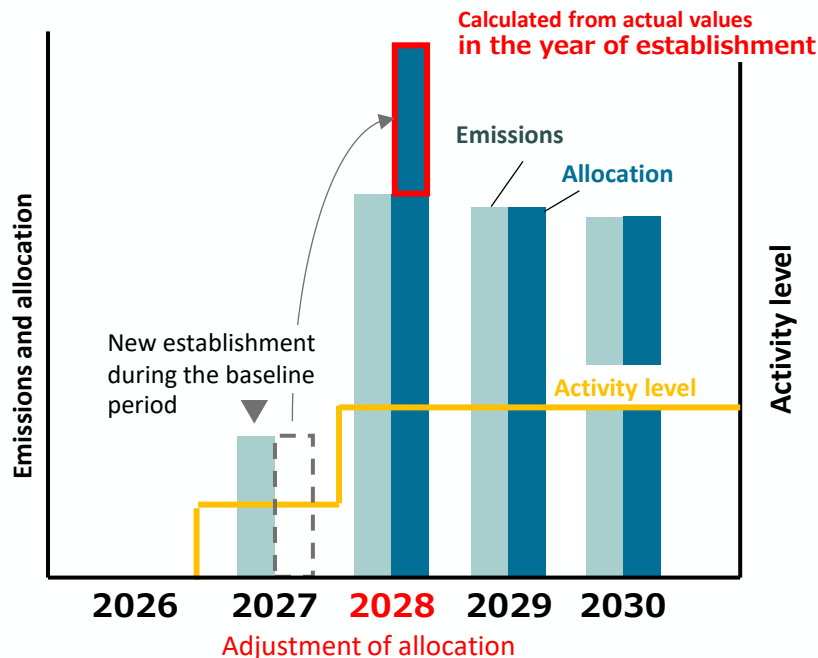


※ Under the Act on the Rational Use of Energy and the Act on Promotion of Global Warming Countermeasures (SHK system), energy use and emissions are reported at the entity level, while facilities using $\geq 1,500$ kL are required to report individually.

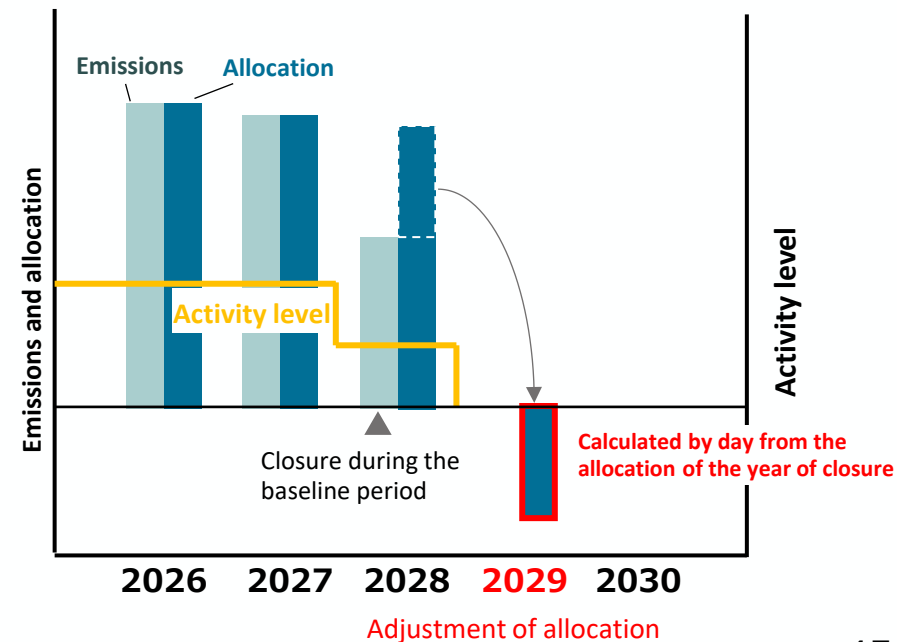
Allocation Adjustments in the Case of Establishment and Closure of Facilities

- **New establishment** of a facility: **Activity levels in the year of establishment will be annualized and then used to determine allocation for subsequent years.** In addition, **an amount corresponding to activity levels in the year of establishment shall be added to the allocation in the following fiscal year.**
- **Closure** of a facility: No allocation shall be made beginning in **the fiscal year following the closure.** **Any excess allowances allocated in the year of closure shall be deducted from the total allocation of the following fiscal year.**

Establishment of a Facility

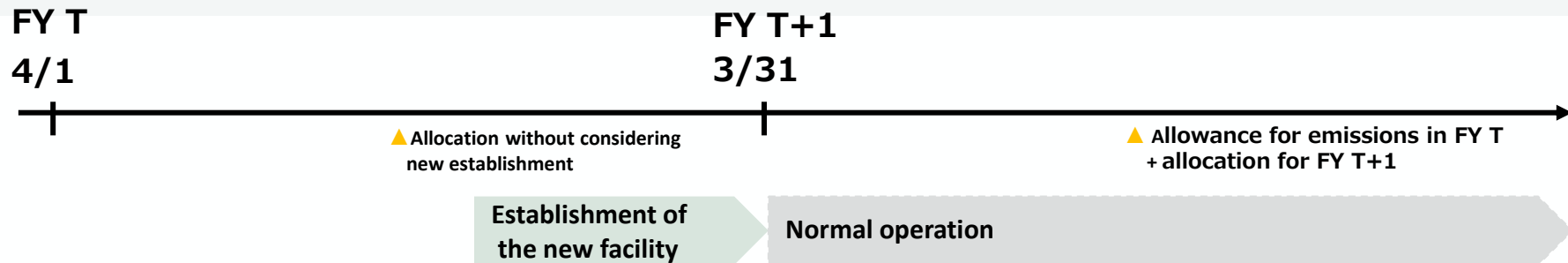


Closure of a Facility



[ref.] Detailed Calculation Method (New Establishment of A Facility)

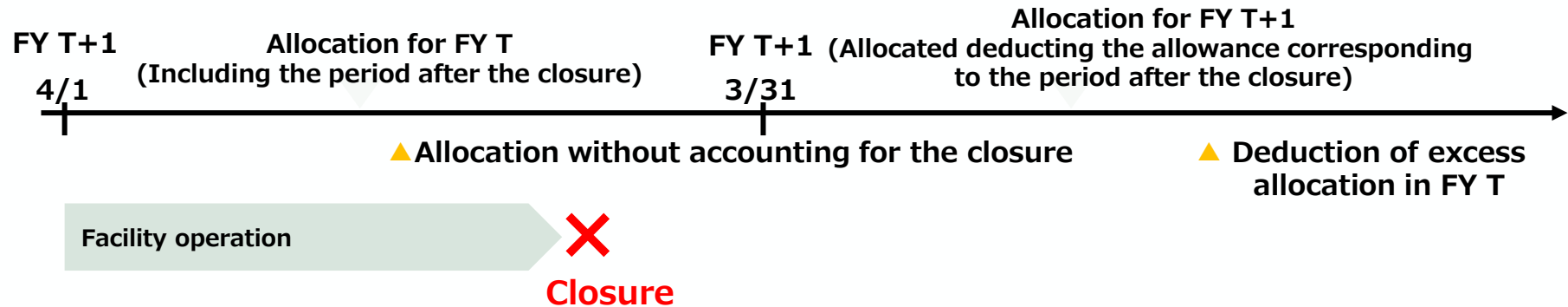
- Emissions generated within the first year of a newly established facility shall be allocated in the following fiscal year based on actual activity levels and emissions.
- Allocations from the following fiscal year onwards are calculated by annualizing the activity level and emissions from the year of establishment to designate a new baseline and then applying the relevant benchmark value or grandfathering reduction rate.



Year of allocation	Method of allocation	Calculation Formula for Allocation Amount
(1) FY T	BM/GF	0
(2) FY T+1	BM	Activity level in FY T _r × annual BM level in FY T _r ···Allocation for emissions in FY T _r + Adjusted baseline activity level * × T + BM level in FY T _r ···Allocation for FY T+1 *Activity level in FY T _r ÷ days of operation FY T _r × 365
	GF	Emissions in FY T _r ···Allocation for emissions in FY T _r + Adjusted baseline emissions* × (1-GF reduction rate). ···Allocation for FY T+1 *Emissions in FY T _r ÷ days of operation in FY T _r × 365
(3) FY T+2	BM	Adjusted baseline activity level × BM level in FY T+2
	GF	Adjusted baseline emissions × (1-GF reduction rate × 2).

[ref.] Calculation method details (Closure of a facility)

- If a facility is closed, the allocation corresponding to the period after the closure shall be calculated per day and deducted from the allocation of the next year.

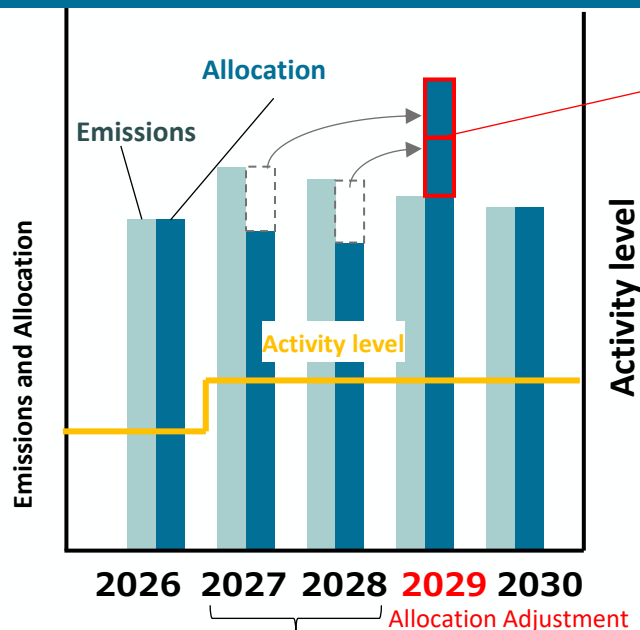


Year of allocation	Method of allocation	Calculation Formula for Allowance Allocation
(A) FY T	BM	Baseline activity level × BM value for FY T
	GF	Baseline emissions × (1-GF reduction rate × years elapsed since baseline year)
(B) FY T+1	BM	-Allocation × for (A) × (1 – days of operation in FY T+1 ÷ 365 days) Excess allocation in FY T
	GF	
(C) FY T+2	BM	0 (exclude from allocation)
	GF	

Allocation Adjustment Method for Changes in Activity Level

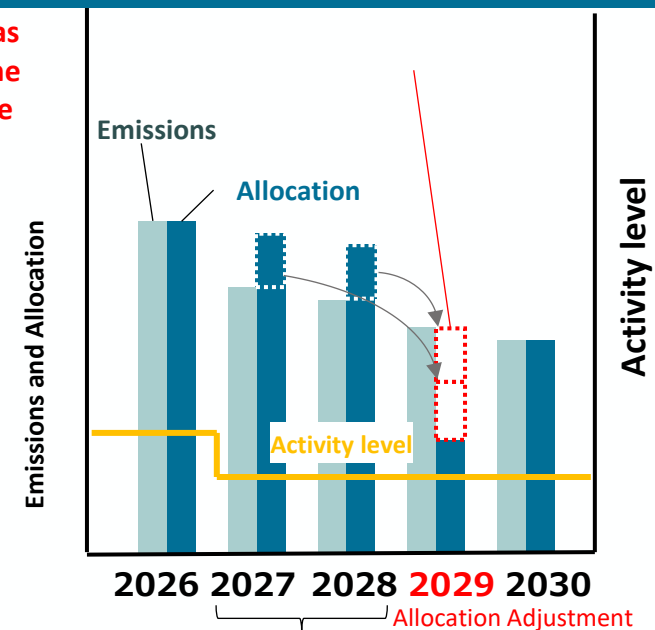
- If the average activity level over the past two fiscal years has increased or decreased beyond a certain threshold compared to the baseline year, the baseline activity level for the following year will be updated to the most recent two-year average.
- In addition, similarly to adjustment measures for establishment or closure, for the two previous years in which the change occurred, the difference between the new baseline and the previous baseline will be added to or deducted from the allocation for the following year.

Increase in Activity Level



An increase of X % or more (compared to the baseline year) in the two-year average activity level

Decrease in Activity Level

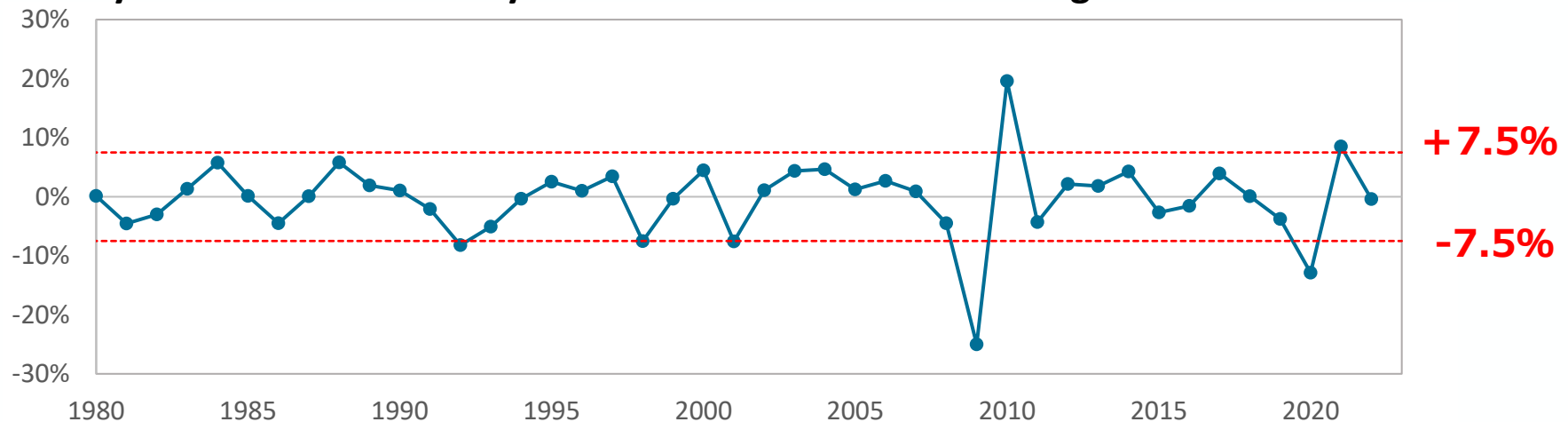


A decrease of X % or more (compared to the baseline year) in the two-year average activity level

Threshold for Activity-Level Changes Subject to Allocation Adjustment

- To design a system that contributes to economic growth, it is crucial **not to discourage increases in activity levels**. Simultaneously, the system **must prevent surplus allowances due to declining activity level from leading to the contraction of domestic businesses**.
- Accordingly, allocation adjustments shall be **implemented only when the magnitude of changes in activity level exceed a specified threshold, indicating a deviation from normal fluctuations in facility utilization**. Setting this threshold is critical.
- Except for years affected by major events such as the global financial crisis or the COVID-19 pandemic, the annual fluctuation **in facility utilization rates among businesses** has **generally remained within $\pm 7.5\%$** compared to the previous year. Thus, changes in activity levels beyond this range will be considered a structural change rather than a normal fluctuation, **and allocation adjustments will be applied**.

Year-on-year variation in facility utilization in the manufacturing sector

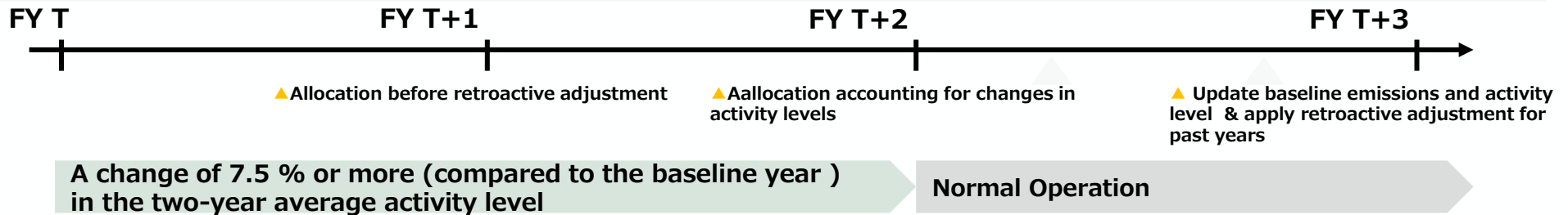


Source: Prepared by the Secretariat based on the Indices of Industrial Production

In these years, the year-on-year rate of change deviates from the median by more than three times the median absolute deviation compared with other years, and can therefore be regarded, from a statistical perspective, as atypical years.

[ref.] Detailed calculation methods (changes in activity level)

- If the average activity level over the past two fiscal years changes by more than a certain threshold compared to the base year, the allocations for the past two fiscal years will be retroactively adjusted, similarly to the calculation for new or closed facilities.



Allocation year	Allocation method	Allocation Formula
(A) FY T+1	BM	baseline activity level (pre-adjustment) × BM value for FY T
	GF	Baseline emissions before adjustment × (1 – GF reduction × years elapsed since the baseline year)
(B) FY T+2	BM	Adjusted baseline activity level* × BM for FY T+2 + Adjusted baseline activity level × BM value for FY T – BM allocation in FY T + Adjusted baseline activity level × BM value for FY T+1 – BM allocation in FY T+1 *Average for the last 2 years
	GF	Adjusted baseline emissions* × (1-GF reduction rate × 1). + Adjusted baseline emissions - GF allocation for FY T + Adjusted baseline emissions - T + GF allocation for FY T+1 *Average for the last 2 years
(C) FY T+3	BM	Adjusted baseline activity level × BM value for FY T+3
	GF	Adjusted baseline emissions × (1-GF reduction × 2).

[ref.] Allocation Adjustments for Facilities Under GF or Fuel BM

- **Under grandfathering**, there is no defined value in the formula for activity level, unlike in benchmarking; therefore, the activity levels must be defined separately.
- To ensure that allocation accounts for the scale of business and enables third-party verifiability, fuel consumption shall be used **as a proxy for activity level**.
- On top of this, in order to avoid penalizing improvements in energy efficiency, measures shall be introduced so that **allocation amounts are not reduced when a decrease in fuel is due to improvements in energy intensity**.
- **The same measures shall apply to facilities subject to fuel benchmarks.**

1. When activity levels (fuel consumption) decrease by 7.5% or more

Improvement in energy intensity* (Compared to the baseline year)	Allocation adjustment
When it can be demonstrated that the rate of improvement in energy intensity is 7.5% or higher	• No reduction in allocation (no adjustment of baseline emissions or activity level)
When it cannot be demonstrated	• Allocation is reduced (baseline emissions and activity level is set as the average of the most recent two years)

2. When activity levels (fuel consumption) increase by 7.5% or more.

Increase in energy intensity (Compared to the baseline year)	Allocation adjustment
When it can be demonstrated that the rate of increase in energy intensity is 7.5% or higher	• Additional allocations (baseline emissions and activity level is set as the average of the most recent two years)
When it cannot be demonstrated	• No additional allocations (no adjustment baseline emissions or activity level)

[ref.] Fuel benchmark

- In several sectors, a **fuel benchmark** is applied as a method of determining allocations in cases **where manufacturing processes are so complex or specific that per-unit emissions of product output are difficult to use as a benchmark.**

$$\text{BM value (Emission Intensity)} = \frac{\text{Emissions from the target process [t-CO}_2\text{]}}{\text{Amount of fuel input [GJ]}}$$

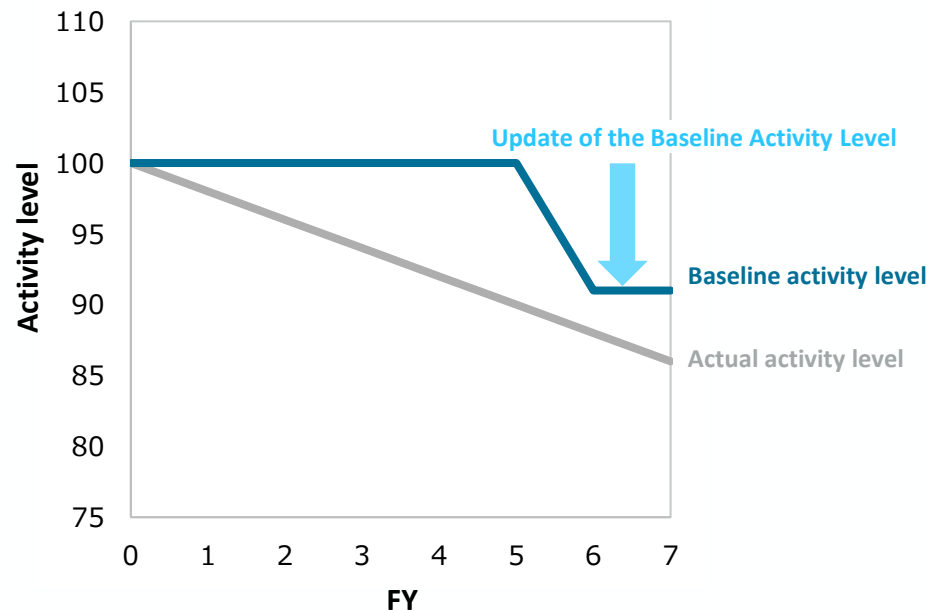
<Example>

	Company A	Company B
Fuel type	coal	LNG
Usage kt	1,000	1,000
Calorific value GJ	26,100	54,700
Emissions t-CO ₂	2,330	2,790
Benchmark value t-CO ₂ /GJ	0.089	0.051

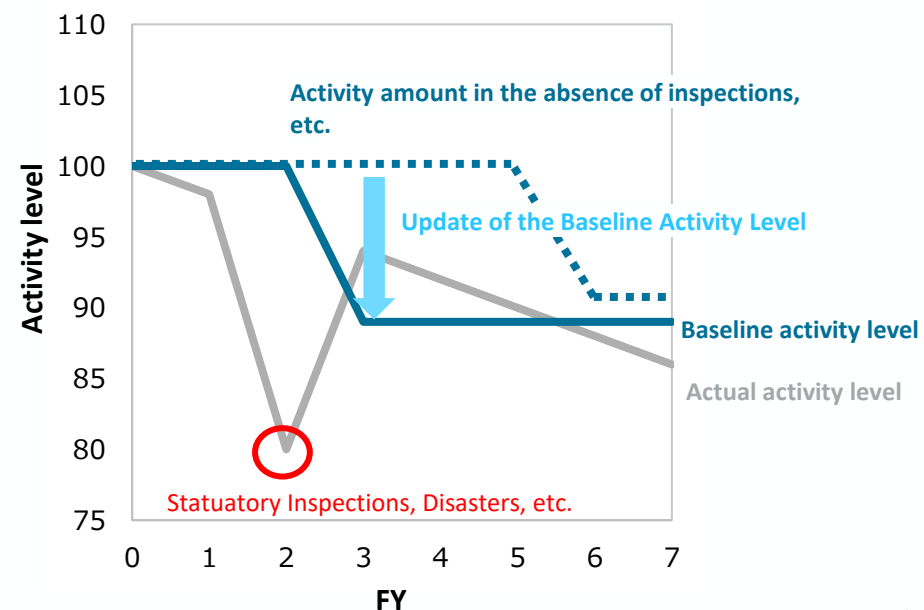
Need for Adjustment Measures in the Case of Disasters, Inspections, etc.

- Under this system, if a facility's activity level changes by 7.5% or more on a two-year average from the baseline year, its baseline activity level is revised.
- However, this can lead to an issue where, if a facility experiences a significant, temporary drop in activity in a single year due to unavoidable factors like mandatory inspections or disasters, its allocation in subsequent years may become lower than appropriate.
- Allocation adjustment must be implemented to prevent significant disadvantages in such cases.

Case without impacts from inspections, disasters, etc.



Case with impacts from inspections, disasters, etc.

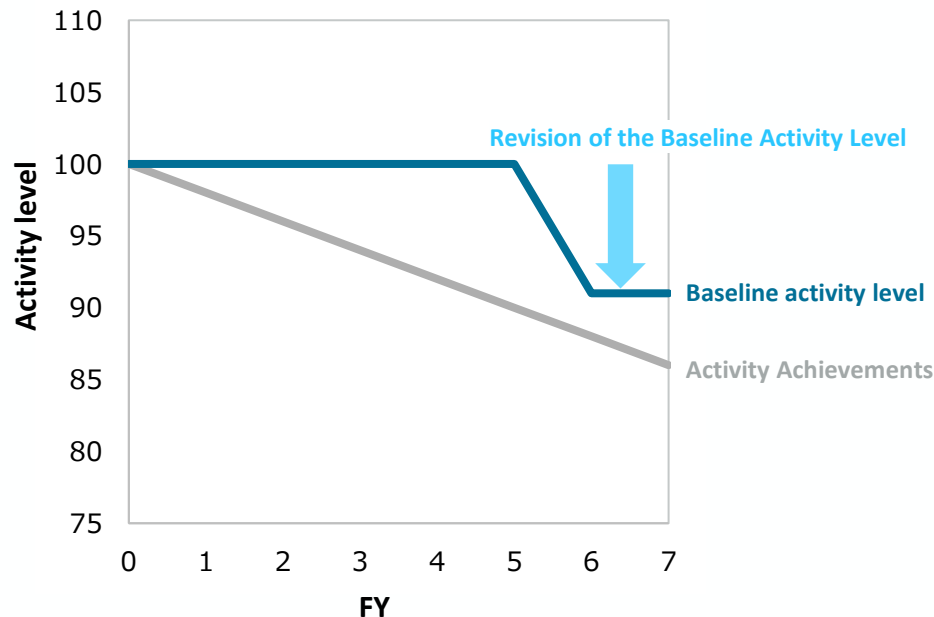


* Assumes the case where facility with a 2% annual decline in activity level experiences an additional 20% drop in a specific year due to inspections, etc.

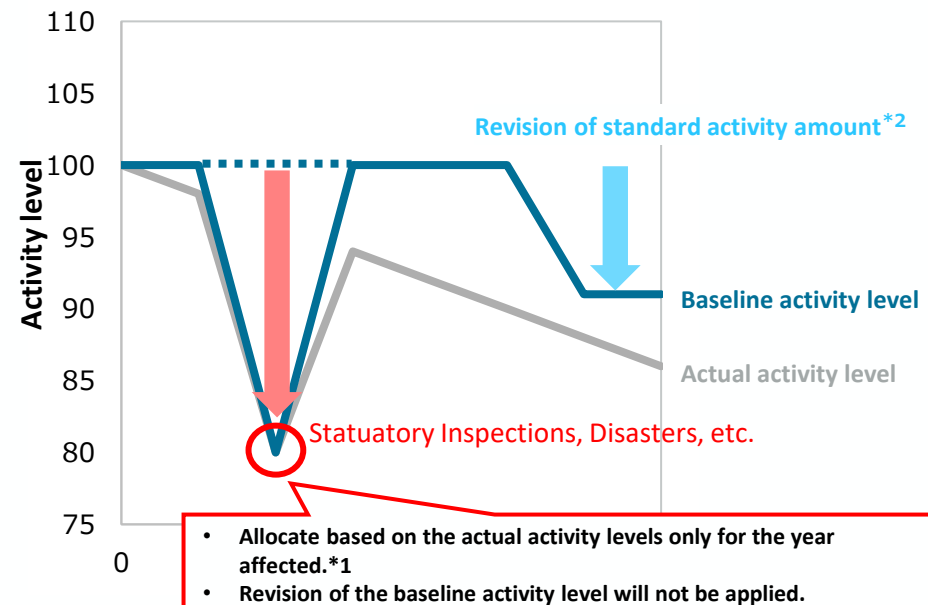
Accounting for Disasters and Mandatory Inspections

- To prevent undue disadvantages, **the update of baseline activity levels will not be applied for activity level changes of $\pm 7.5\%$ or more when they are caused by disasters or mandatory inspections under the High-Pressure Gas Safety Act.**
- In addition, **for any year in which these impacts occur,** adjustments will be made so that the allocation is calculated as: **allocation = actual activity levels \times BM value.**

In cases of no impacts from statutory inspections, disasters, etc.



In cases of impacts from statutory inspections, disasters, etc.



*1 In the case where GF is applied, allocation will be the smaller of "baseline emissions \times (1 - annual reduction rate \times years since the baseline year)" and "the quantity equivalent to actual emissions in the relevant year" (to be adjusted retroactively at the time of allocation for the following year).

*2 When calculating the rate of change in activity level for years following an affected year, the activity level for the affected year shall be calculated as the average of the two preceding years.

[ref.] The Scope of Disasters Eligible for Allocation Adjustment Measures

- In the case of disasters, allocation adjustment measures will apply if a facility experiences a fluctuation in activity level of 7.5% or more from the baseline year (in which there were no applicable impacts from disasters). This applies to facilities located in areas designated under the Special Disaster Measures Act, the Severe Disaster Relief Act, or the Disaster Relief Act.

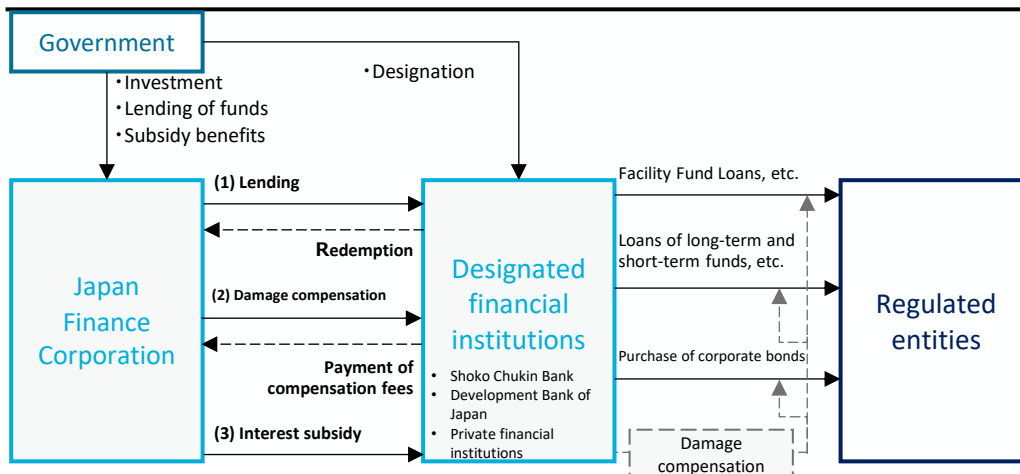
[ref.] Overview of each law

	Overview	Disasters that have been designated
Special Disaster Measures Act (Act on Special Measures for Large-Scale Disasters)	Designates a disaster as a "large-scale extraordinary disaster" when it is deemed an "extremely abnormal and severe extraordinary disaster" and recognized as necessary to take measures to protect the administrative rights and interests of victims.	<ul style="list-style-type: none"> - The Great East Japan Earthquake - Typhoon No. 19 of 2019 - Heavy rain in July 2020 - Noto Peninsula Earthquake, etc.
Severe Disaster Relief Act (Act on Special Financial Support to Deal with Extremely Severe Disasters)	Designates a disaster as an "extremely severe disaster" when it is deemed necessary to alleviate the fiscal burden on local governments or provide special financial support to victims. Specifies special national subsidies for applicable disaster recovery projects.	<p>In addition to the above disasters:</p> <ul style="list-style-type: none"> - Heavy rain in August 2021 - Typhoons No. 14 and No. 15 of 2022 (storm and heavy rain)
Disaster Relief Act	Enables prefectural governors to apply the Act to provide urgent and necessary relief to victims, protect them, and maintain social order within affected municipalities.	<p>In addition to the above disasters, the Act was applied to:</p> <ul style="list-style-type: none"> - Heavy snow from 7 January 2021 - Power outages caused by Typhoon No. 6 of

[ref.] Other cases subject to adjustment measures

- In addition to natural disasters, **economic activity may also contract significantly due to economic crises, the spread of infectious diseases,** or similar events.
- For example, the Japan Finance Corporation Act allows the competent minister to declare a crisis in response to **major economic changes or large-scale disasters,** enabling financial support such as loans for affected businesses ("**crisis response operations**")
- Should a non-natural disaster event **with a major nationwide economic impact occur** in the future, consideration will be given to applying company-wide allocation adjustment measures. This would apply to regulated entities experiencing an **activity level decline of 7.5% or more in a single year,** while also accounting for crisis certifications under the aforementioned system and similar schemes.

Overview of Crisis Response Operations



Major Certified Cases

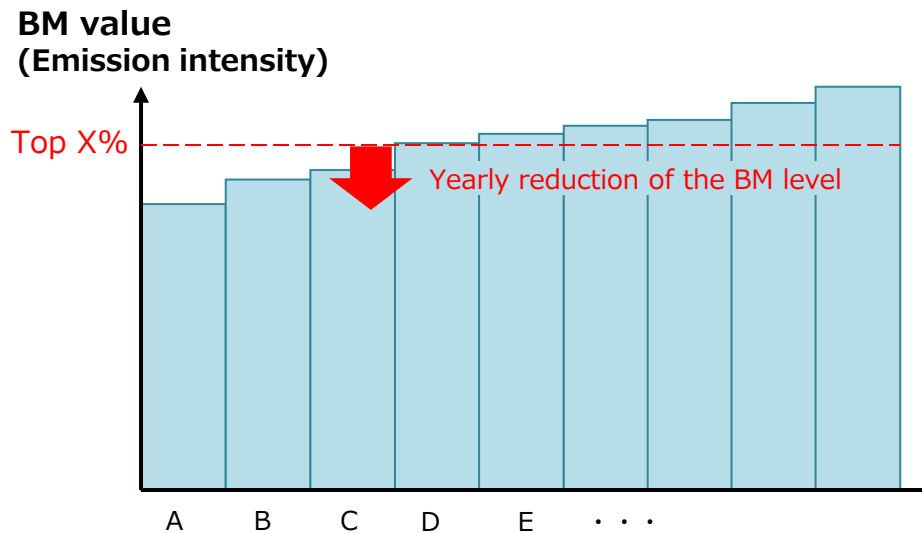
2020	COVID-19 pandemic
2016	Kumamoto Earthquake
2012	Heavy rain in northern Kyushu
2011	Great East Japan Earthquake
2008	Global financial crisis

5-2. Allocation Based on Benchmarking

Concept of allocation using benchmarking

- In this ETS, **BM value is expected to be gradually lowered each year.**
- Target levels should be set to steadily encourage investment toward emissions reduction, **while also considering the realistic timeline needed for regulated entities to reduce emissions.**

Overview of Benchmarking



- The emission intensity at the top X% level (*) within the same sector is set as the benchmark.
- Allocation is calculated by multiplying the benchmark with the baseline activity level (the average production volume, etc. of the three fiscal years immediately before the start of the system: FY2023–FY2025).

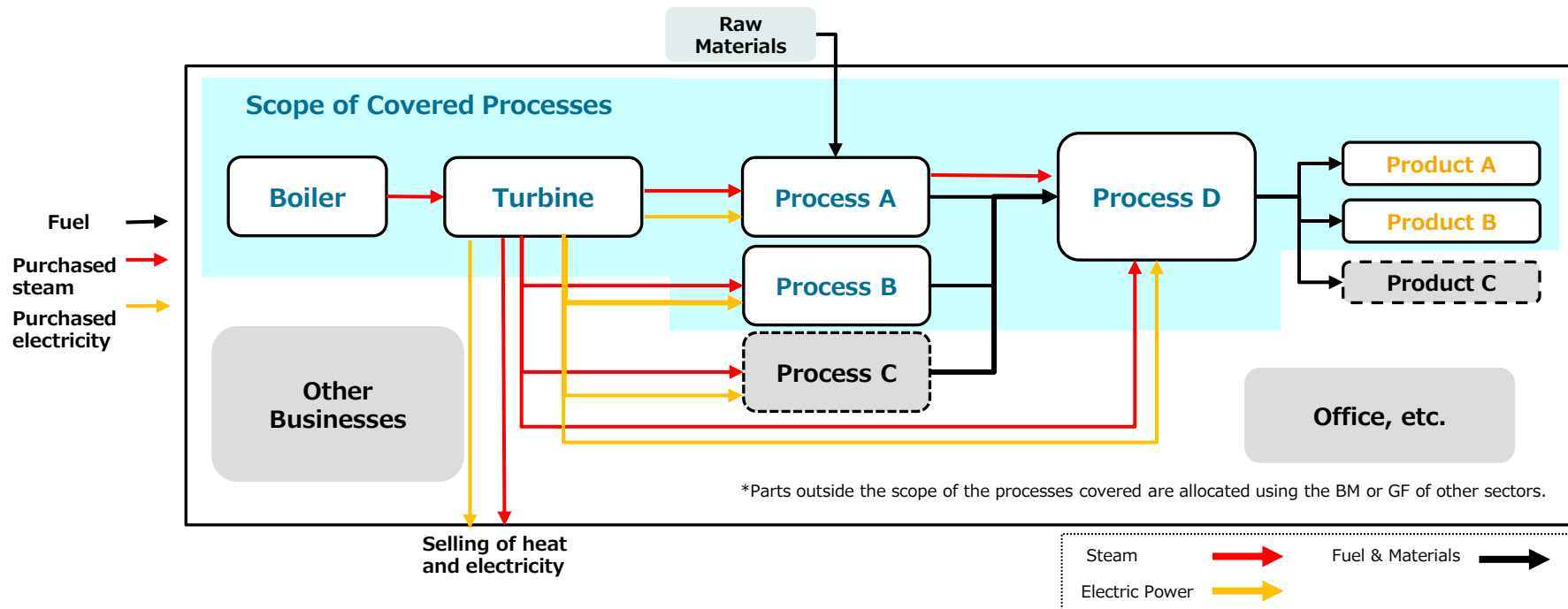
Allocation = Baseline activity × Target emissions intensity for each FY

*The top X % level is calculated based on data from the baseline year. The level is gradually lowered each year to tighten the allocation benchmark

[ref.] Sector-Specific Considerations

- A benchmark value is an emission intensity indicator, defined **as the emissions from a specific production process (numerator) divided by the production volume of the corresponding product (denominator).**
- Defining the activity level and the scope of processes covered by the benchmarking, for each sector, is crucial.

$$\text{BM value (Emission Intensity)} = \frac{\text{Emissions from the target process}}{\text{Activity level (production volume of target products, etc.)}}$$



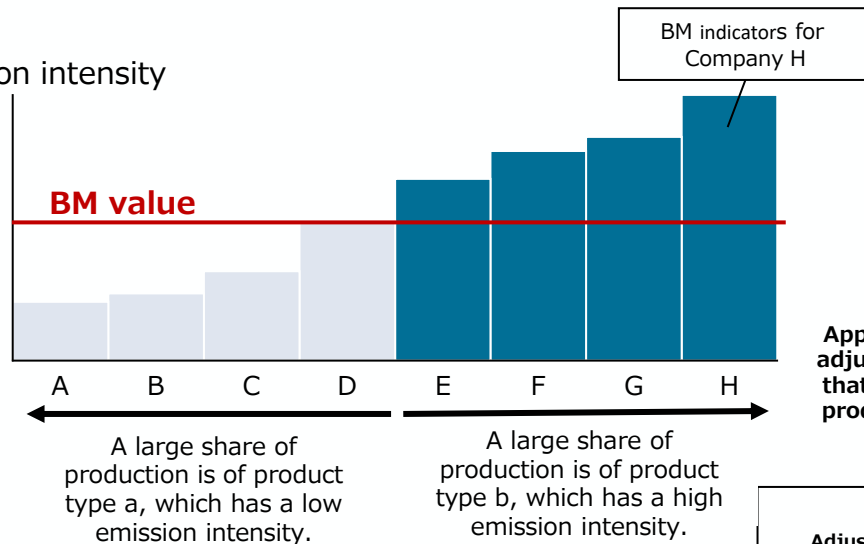
[ref.] BM Value Adjustments Accounting for Product Type and Mix

- In product benchmarks such as pulp and paper, CO2 emission intensity is used as the basis for determining the benchmark value. Once emission intensity is adjusted to neutralize differences arising from each company's product type and mix, the adjusted emission intensities for each company are compared before determining the final benchmark value.

Concept of adjustment – Excerpt from the Pulp and Paper Product BM Presentation Material

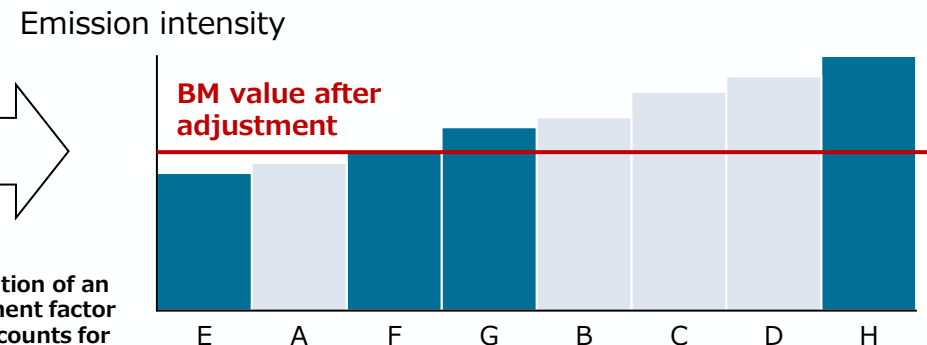
Before adjustment

- Differences in emission intensity among companies arise from their product type and mix, not from their individual emission reduction efforts..



After adjustment

- To neutralize the differences in emission intensity caused by product type and mix, an adjustment is made by normalizing each company's performance to a standard product mix.



Application of an adjustment factor that accounts for product type and mix

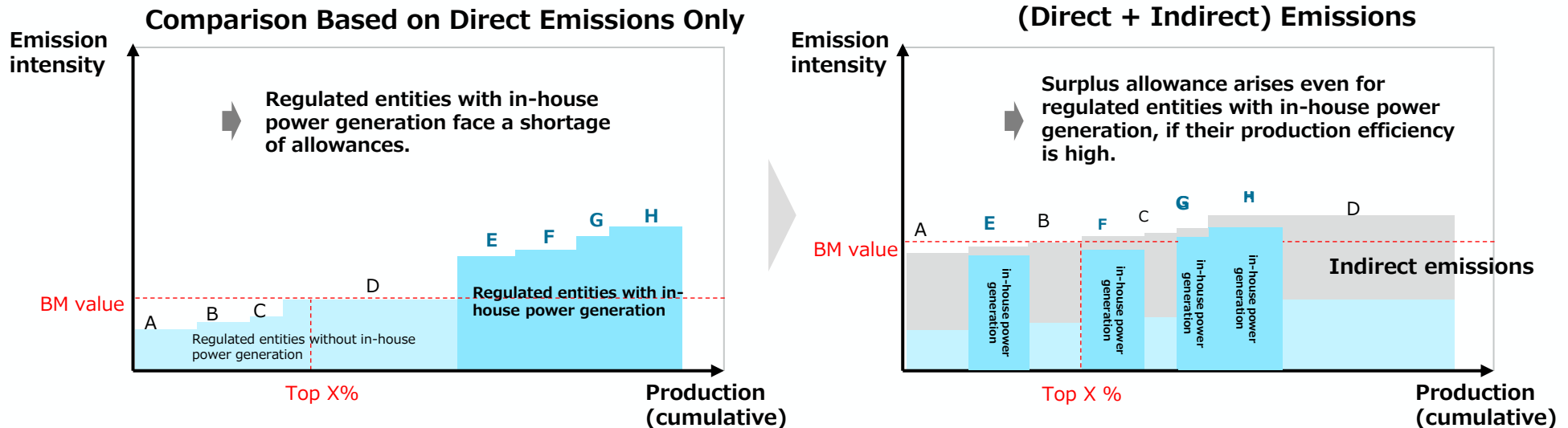
Adjustment Factor taking composition into account

=

$$\frac{\text{Emission intensity based on the industry-average product mix}}{\text{Emission intensity based on each company's actual product mix}}$$

[ref.] Adjustment for the Share of Direct Emissions

- In some sectors, the choice between using purchased electricity and steam versus in-house generation creates significant variations in the level of direct emissions. This affects the emission intensity when it is calculated based on direct emissions only.
- To ensure fairness, the benchmark value for these sectors **is determined based on total (direct + indirect) emissions**. The free allocation of **allowances is then calculated by multiplying this benchmark value by the direct emission ratio of each regulated entity**.



[ref.] Adjustment Method for the Share of Direct Emissions

- In some sectors, the variation in the share of direct emissions among regulated entities is minimal, as most emissions from the target process are direct emissions. Therefore, the decision on whether to apply this adjustment is made on a sector-by-sector basis.
- For sectors where this adjustment is applied, the method of determining the benchmark value and the allocation formula are standardized as described below.
- The method for calculating indirect emissions and the specific emission factors to be used will also be defined to ensure consistency among regulated entities.

Sectors subject to adjustment

- This adjustment may be applied to sectors with significant variation among regulated entities in the use of on-site power generation. The decision is at the discretion of the competent minister for each sector, with the aims of:
 1. Ensuring fairness among regulated entities, and
 2. Simplifying administration and enforcement.

Benchmark value and allocation formula

Benchmark value:

$$\text{Benchmark value} = \frac{\text{Direct emissions} + \text{indirect emissions}^{*1}}{\text{Activity level}}$$

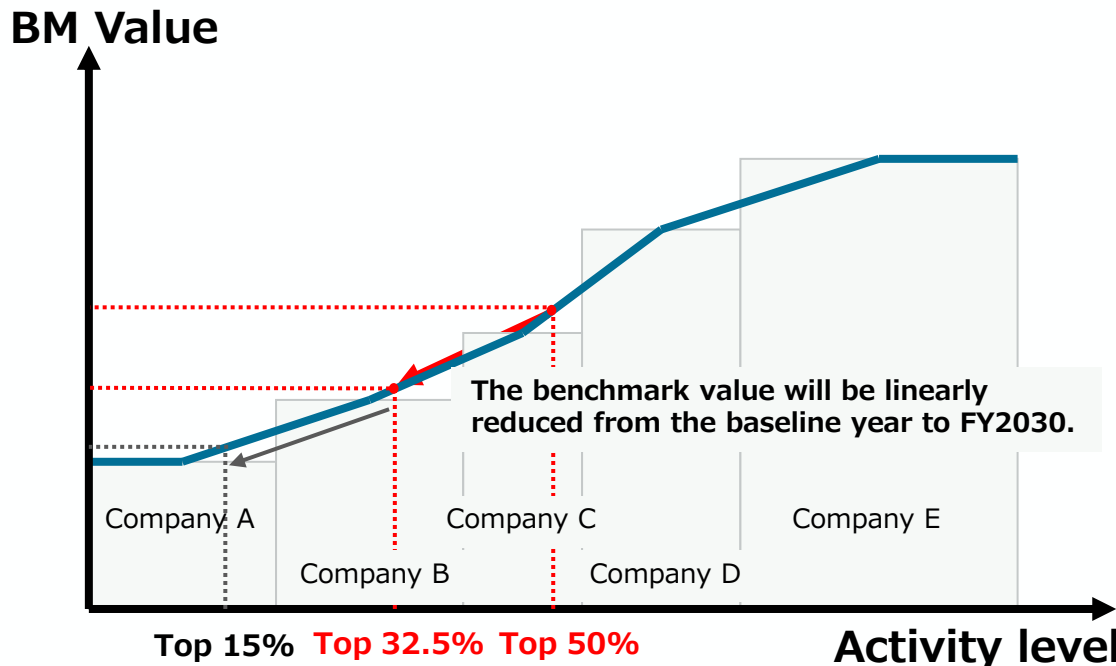
Allocation Formula:

$$\text{Allocation amount} = \text{benchmark value} \times \text{baseline activity level} \times \frac{\text{Direct emissions of the previous year}}{\text{Direct emissions from the previous year} + \text{indirect emissions from the previous year}^{*1}}$$

*1 Indirect emissions are calculated using the national average emissions factor

Concept for Setting Sector-Specific Benchmark Values

- Based on experience with the Act on the Rational Use of Energy and similar policies, **it typically takes about 10 years for an entire sector to achieve the performance level of its top-runners (e.g., the top 15%).**
- If the starting benchmark is **set at the median performance level (top 50%) in the baseline year**, the target benchmark value **for FY2030** (5 years later) should be set at the **top 32.5%** level, which is the midpoint between the top 15% (top-runner) and top 50% (median) levels.
- For the interim years, benchmark values are calculated by linear interpolation between the baseline year value (top 50%) and the FY2030 value (top 32.5%).



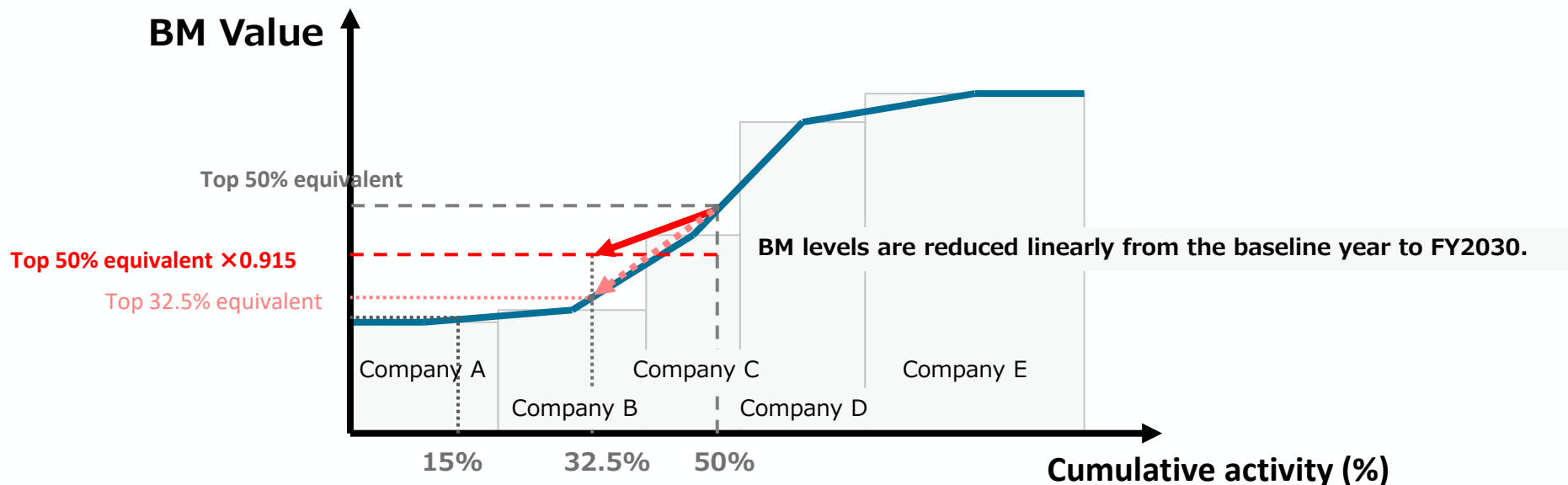
Example: top 50%: 1.50 t-CO₂/t, top 32.5%: 1.20 t-CO₂/t

Fiscal year	Benchmark Value t-CO ₂ /t-Product
Baseline year	1.50 (Equivalent to the top 50%)
FY2026	1.44
FY2027	1.38
FY2028	1.32
FY2029	1.26
FY2030	1.20 (Equivalent to the top 32.5%)

※ The top X% level for each sector is calculated by applying weighting based on activity level, rather than using simple percentile values based on the number of regulated entities.

Allocation Levels for BM Sectors with Large Gaps Between Top and Median Performers

- **Benchmark values** should be set while taking into account the relative difficulty for each sector to achieve them. To ensure fairness among benchmark-covered sectors, a uniform **benchmark percentile should be applied across all sectors.**
- However, during the initial five years of the system (FY2026–FY2030), **some sectors will not be subject to benchmarking and will instead receive allowances based on grandfathering (GF) due to data limitations.**
- **To avoid significant discrepancies in the required reduction rates between BM and GF sectors, a special measure will apply for the first five years.** The benchmark value for FY2030 will be **set as the greater of (i) the top 32.5% performance level, or (ii) the top 50% (median) performance level × 0.915** (*). Annual values will then be interpolated linearly.
- *Derived from the reduction rate required for GF sectors in FY2030 ($1 - 0.017 \times 5 = 0.915$).



Treatment of By-Product Fuels

- The effective utilization of by-product fuels, which are unavoidably generated in manufacturing processes, is crucial for overall emissions reduction.
- However, compared to conventional fuels, **by-product fuels often have a higher carbon content and lower combustion efficiency, resulting in higher emissions per unit of product.**
- Therefore, the free allocation method under benchmarking must account for these characteristics. **This ensures that regulated entities effectively utilizing by-product fuels are not placed at a significant disadvantage.**

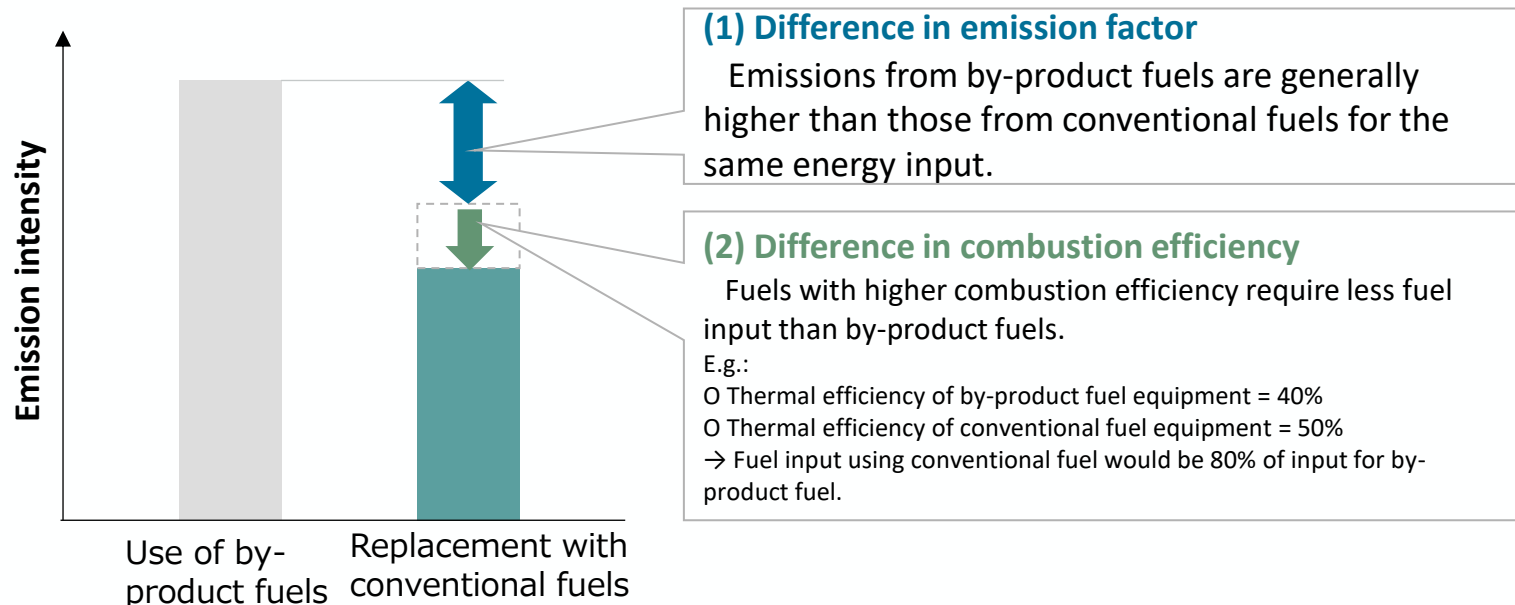
Drivers of the Difference in Emission Intensity between By-Product and Conventional Fuels

$$\frac{\text{Emissions [t-CO}_2\text{]}}{\text{Production Volume [T-Product]}} = \frac{\text{Emissions [t-CO}_2\text{]}}{\text{Fuel Consumption [GJ]}} \times \frac{\text{Fuel Consumption [GJ]}}{\text{Production Volume [T-Product]}}$$

Emission intensity = **(1) Difference in emission factors** × **(2) Difference in combustion efficiency**

Adjustment Method for Differences in Emission Factors and Combustion Efficiency of By-Product Fuels

- To avoid discouraging the use of by-product fuels, the free allocation of **allowances is adjusted to compensate for the difference in emissions that arises when they are used instead of conventional fuels.**
- The difference in emissions, driven by emission factors and combustion efficiency, is calculated as follows:



$$\text{Difference in emissions} = \text{byproduct fuel consumption} \times \left(\text{byproduct fuel emission factor} - \text{conventional fuel emission factor} \right) \times \frac{\text{Thermal efficiency of facilities using byproduct fuels}}{\text{Thermal efficiency of conventional fuels}}$$

Emission Adjustment
Combustion efficiency Adjustment

Allocation Method for By-Product Fuels

- For emissions from the use of by-product fuels, an additional allowance is granted for the fuel consumption process. This additional allowance is calculated using the grandfathering (GF) approach to compensate for the emission difference compared to conventional fuels.
- For processes subject to a fuel benchmark (BM), allowances are based on fuel consumption as the proxy for activity level. Therefore, differences in combustion efficiency are not considered. **By-product fuels are treated separately from other fuels and receive a separate allocation.**
- Given that reduction options for by-product fuels are limited compared to conventional fossil fuels, the GF annual reduction rate applied will be the same as that for process-related emissions (as outlined below).

When the Consuming Process is Covered by a Product Benchmark

Product Benchmark × Activity Level

+ Baseline By-product Fuel Consumption*¹

× (By-product Fuel Emission Factor – Sector-Average Emission Factor × 0.85*²)

× (1 – GF Annual Reduction Rate × Years Elapsed)

When the fuel-consuming process is subject to a fuel BM

Fuel Benchmark × Fuel Consumption excluding by-product fuels

+ Baseline By-product Fuel Consumption × By-product Fuel Emission Factor

× (1 – GF Annual Reduction Rate × Years Elapsed)

*1 This additional allocation applies only to the consumption of by-product fuels transferred from other processes. It excludes by-product fuels generated and consumed within the same product-BM process boundary to prevent double counting, as their emissions are already accounted for in the main benchmark. Furthermore, fuels that are widely traded on the market (e.g., via import/export) are treated as conventional fuels and are therefore also ineligible for this allocation.

*2. Derived by comparing power generation efficiency between domestic LNG-fired power plants and facilities that are co-firing by-product fuel.

*3 In sectors such as blast furnace steelmaking and carbon black production, the supply process accounts for emissions from by-product fuels transferred to other processes (i.e., these emissions are included in the supplier's benchmark numerator). To prevent double allocation in such cases, the supplier's free allocation is reduced by an amount calculated from its baseline year supply of by-product fuel, adjusted by the applicable GF annual reduction rate.

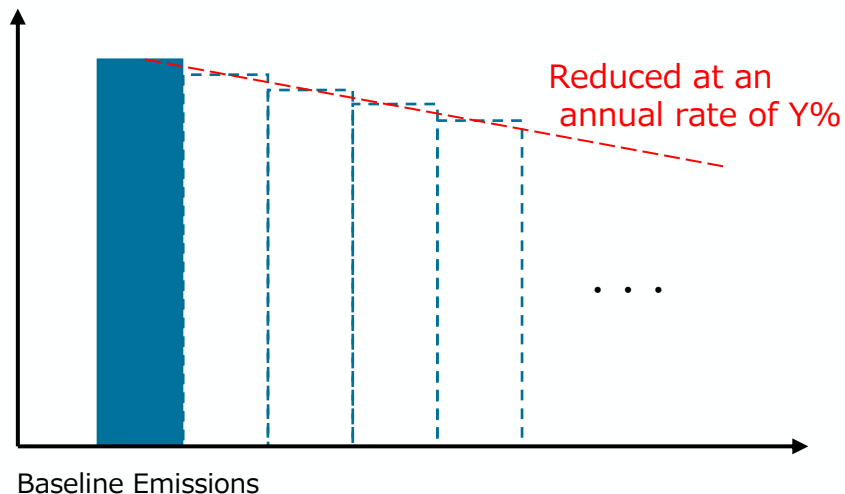
5-3. Allocation under Grandfathering

Approaches to Allocation Under Grandfathering

- Emission sources not covered by benchmarking will receive allocation via grandfathering.
- **The annual reduction rate for allowances under grandfathering must be determined while ensuring fairness relative to the reduction levels required under benchmarking.**
- Additionally, **an appropriate reduction rate must be examined for process-derived CO₂,** for which abatement options are limited compared to energy-related CO₂.

Overview of the Allocation Method under Grandfathering

Emissions



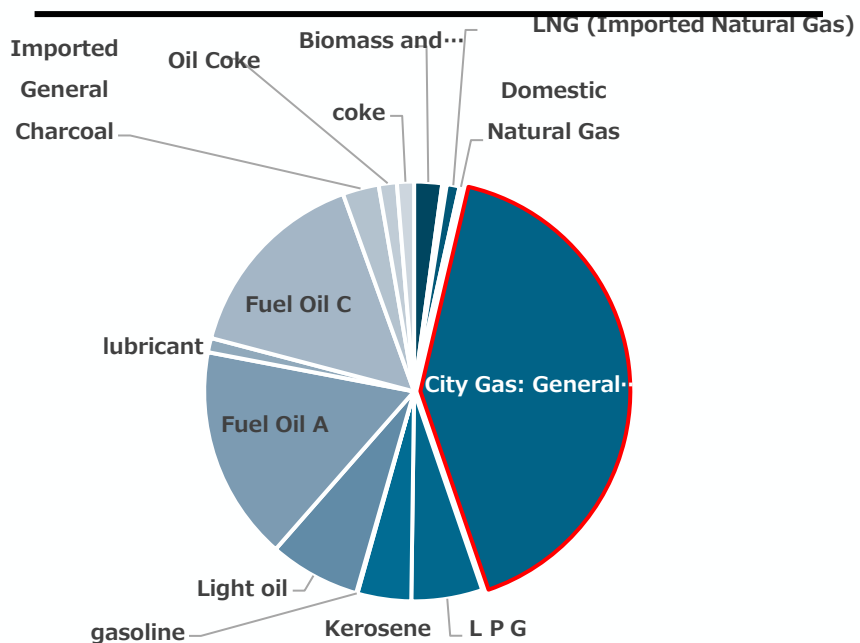
- Allocation is decreased annually by a fixed rate based on past emissions.
- Allocation is calculated by applying a fixed reduction rate to baseline emissions (the average emissions over the three fiscal years immediately preceding the system's launch: FY2023–FY2025)

$$\text{Allocation} = \text{Baseline Emissions} \times (1 - (\text{Annual Reduction Rate} \times \text{Years Elapsed from the Baseline}))$$

Approaches to Setting a Reduction Rate for Energy-related CO₂

- **In sectors subject to benchmarking**, where it **is difficult to use emissions intensity per unit of product** (i.e., product benchmarks) as an indicator, the adoption of a **fuel benchmark** will be considered to evaluate the progress of fuel switching.
- Similarly, for sectors subject to grandfathering, the annual reduction rate will be determined by estimating **the reduction potential achievable through fuel switching**.
- In sectors subject to grandfathering, **approximately 40% of energy use has already been switched to city gas (which has a lower emission factor)**. Assuming that **the remaining energy sources are decarbonized to the level of city gas at a rate consistent with benchmarking**, the annual reduction rate required is **1.7%**. This will be established as the reduction rate for these sectors.

Fuel Mix in Sectors Subject to Grandfathering



Approach to Setting the Reduction Rate

Average Emission Factor for Sectors Subject to Grandfathering: **61.8 t-CO₂/TJ**



Target improvement over the next 10 years
(Annual reduction rate of 1.7%)

Top-level Emission Factor: **51.3 t-CO₂/TJ**

(emission factor of city gas)

※ Prepared by the Secretariat based on the Comprehensive Energy Statistics. This figure covers the manufacturing, transport, energy conversion, and related sectors, excluding those where the majority of emissions are expected to be covered by the benchmarks currently under consideration. Fuels consumed in the applicable sectors are listed in ascending order of their emission factors.

5-4. Accounting for Business Transfers and Related Events

Accounting for Business Transfers and Splits

- Unlike a simple transfer of assets (e.g., facilities), **in the case of business transfers or business splits, allowances associated with the relevant business may be transferred** in joint with other operations, depending on the contractual terms.
- Therefore, as a general rule, **allowances for the fiscal year in which the transfer or split is executed shall be allocated to the transferor or the splitting corporation.**
- For allocations **in subsequent fiscal years, the allocation amount will be calculated based on** the assumption that the transferee or the successor company has succeeded to **the baseline activity level and baseline emissions of the transferor or splitting corporation.**

■ From a regulated entity to another regulated entity



■ From a regulated entity to a non-regulated entity



■ From a non-regulated entity to a regulated entity



	Allocation for the Transferred Business	Holding Obligation for Emissions from the Transferred Business
From a regulated entity to another regulated entity		
A	Year of the Transfer/Split: subject to allocation Following fiscal year: no allocation	Year of the Transfer/Split: emissions up to the day before the execution date
B	Year of the Transfer/Split: no allocation Following fiscal year: subject to allocation ※ The baseline activity level and baseline emissions are succeeded from A.	Year of the Transfer/Split: emissions on and after the execution date
From a regulated entity to a non-regulated entity		
A	Year of the Transfer/Split: subject to allocation Following fiscal year: no allocation	Year of the Transfer/Split: emissions up to the day before the execution date
B	Year of the Transfer/Split: no allocation Following fiscal year: allocation is made if B newly becomes a regulated entity under the system ※ No allocation is made if B's three-year average emissions do not reach 100,000 tons.	Year of the Transfer/Split: emissions on and after the execution date ※ Under Article 44 of the Amended GX Promotion Act, an obligation to surrender allowances for emissions on and after the execution date is imposed.
From a non-regulated entity to a regulated entity		
A	Not subject to allocation	Not subject to obligation
B	Year of the Transfer/Split: no allocation Following fiscal year: subject to allocation ※ Retroactive allocation is made for the year of the transfer/split based on activity levels and emissions (similar treatment to the new establishment of facilities).	Year of the Transfer/Split: emissions on and after the execution date

Accounting for Mergers

- In the case of a merger, **all rights and obligations of the dissolving company are comprehensively inherited by the surviving company or the newly incorporated company.**
- Therefore, **the obligation to hold allowances corresponding to the emissions of the dissolving company in the fiscal year of the merger's execution shall be borne by the surviving company or the newly incorporated company.**
- **For allocations in subsequent fiscal years, as in the case of business transfers, the surviving company shall be treated as having succeeded to the baseline activity level and baseline emissions of the dissolving company.**

■ From a regulated entity to another regulated entity



■ From a regulated entity to a non-regulated entity



■ From a non-regulated entity to a regulated entity

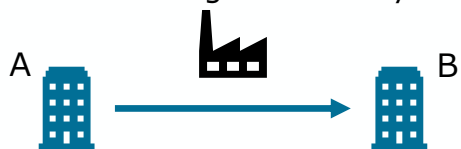


	Allocation for the Merged Business	Holding Obligation for Emissions from the Merged Business
From a regulated entity to another regulated entity		
A	Year of merger: allocation is made to either A or B ※ If allocation is made before the merger, it is allocated to A; if allocation is made after the merger, it is allocated to B.	—
B	Following fiscal year: allocation is made to B ※ No allocation is made if B's three-year average emissions do not reach 100,000 tons.	Year of merger: emissions including the period before the execution date
From a regulated entity to a non-regulated entity		
A	Year of merger: allocation is made to either A or B ※ If allocation is made before the merger, it is allocated to A; if allocation is made after the merger, it is allocated to B.	—
B	Following fiscal year: allocation is made if B newly becomes a regulated entity under the system ※ No allocation is made if B's three-year average emissions are less than 100,000 tons.	Year of merger: emissions including the period before the execution date ※ Under Article 44 of the amended GX Promotion Act, an obligation to surrender allowances for emissions on and after the execution date is imposed.
From a non-regulated entity to a regulated entity		
A	Not subject to allocation	Not subject to obligation
B	Year of merger: no allocation Following fiscal year: subject to allocation ※ Retroactive allocation is made for the year of the merger based on activity levels and emissions (treated similarly to the new establishment of facilities).	Year of merger: emissions on and after the execution date

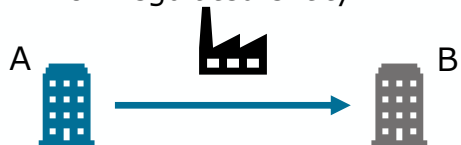
[ref.] Cases where a Facility is the Object of Sale

- For specific succession cases (excluding business transfers) where a facility is the object of the transaction, adjustments will be implemented in the same manner as for the new establishment or closure of a facility

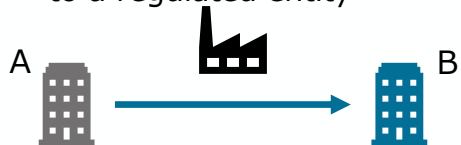
- From a regulated entity to another regulated entity



- From a regulated entity to a non-regulated entity



- From a non-regulated entity to a regulated entity



	Allocation for the inherited Establishment	Holding Obligation for Emissions from the Relevant Establishment
From a regulated entity to another regulated entity		
A	Adjustment made during allocation for the following fiscal year	Year of transfer: Emissions up to the day before the transfer date
B	Adjustment made during allocation for the following fiscal year	Year of transfer: Emissions on and after the transfer date
From a regulated entity to a non-regulated entity		
A	Adjustment made during allocation for the following fiscal year	Year of transfer: emissions up to the day before the transfer date
B	Not subject to allocation	Not subject to obligation
From a non-regulated entity to a regulated entity		
A	Not subject to allocation	Not subject to obligation
B	Treated as a new establishment	Year of transfer: Emissions on and after the transfer date

6. Other Considerations Related to Allocation

Approaches to Allocation Outlined in Government Guidelines

- Government guidelines under the GX Promotion Act outline how to calculate allocation amounts for each industry sector.
- Allocations should account for past reduction efforts, leakage risk, and the scale of investments in R&D that have yet to deliver tangible reduction results, while using benchmarking and grandfathering as baseline methods.

Sector-based Standards

Emission-intensive sectors

Benchmarking (baseline activity level × Benchmark value)

Other sectors

Grandfathering (baseline Emissions × (1 - Annual reduction rate)
+

Other Key Considerations

(1) Early reduction

For facilities under grandfathering, if emission reductions achieved before start of the ETS exceeds the standard reduction rate, the amount of excess reduction is added to baseline emissions.

(2) Leakage risk

If the main business is classified as a carbon leakage sector and the cost of procuring allowances (emission shortfall × average market price) exceeds a certain share of revenue, a set percentage of the shortfall is added to the allocation.

(3) Status of R&D investment

Additional allowances will be granted within the range of the allowance shortfall based on the amount of GX-related R&D investment in the previous fiscal year,

(4) Changes in activity levels, etc.

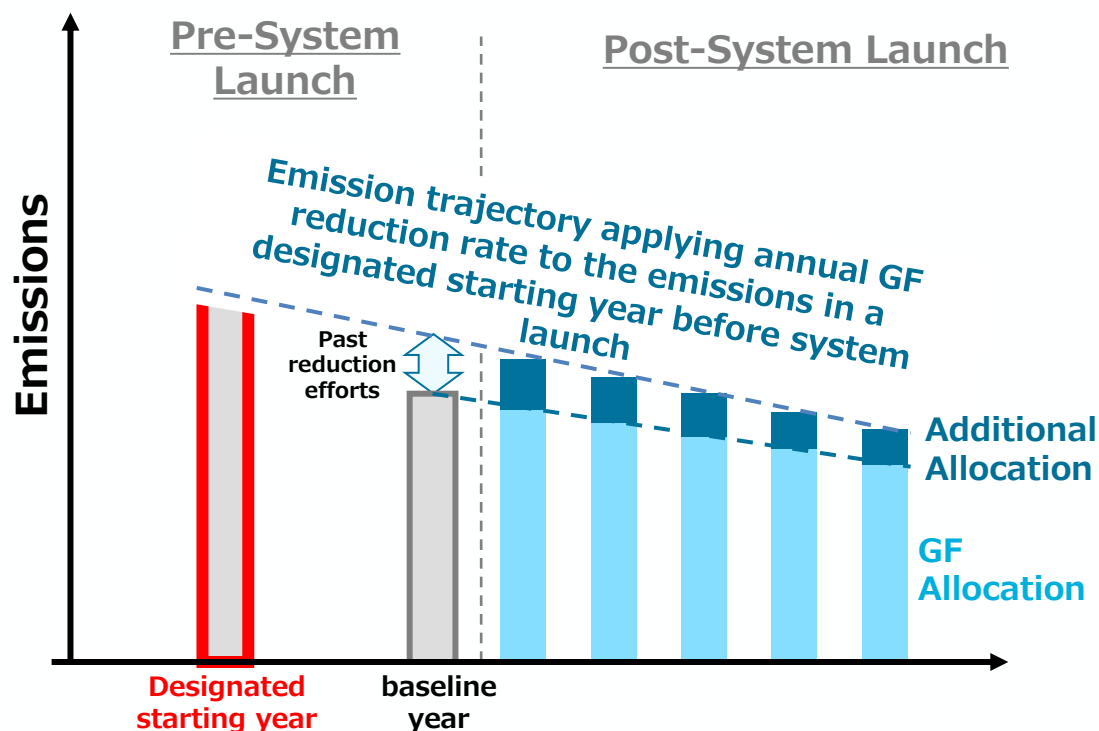
Allocations will be adjusted in the event of new establishment or closures of facilities, or significant changes in production (activity levels).

6-1. Accounting for Past Reduction Efforts

Key Issues in System Design: Accounting for Past Reduction Efforts

- For emission sources covered by grandfathering (GF), **emission reductions achieved prior to the baseline period which exceed the annual GF reduction rate** will be recognized as past reduction efforts, and **will be reflected in the allocation for the five-year period starting in 2026.**
- To implement this, it is crucial to **clarify the approach for selecting the starting year for calculating past reduction efforts** and the **method for verifying past reduction amounts.**

Accounting for Past Reduction Efforts

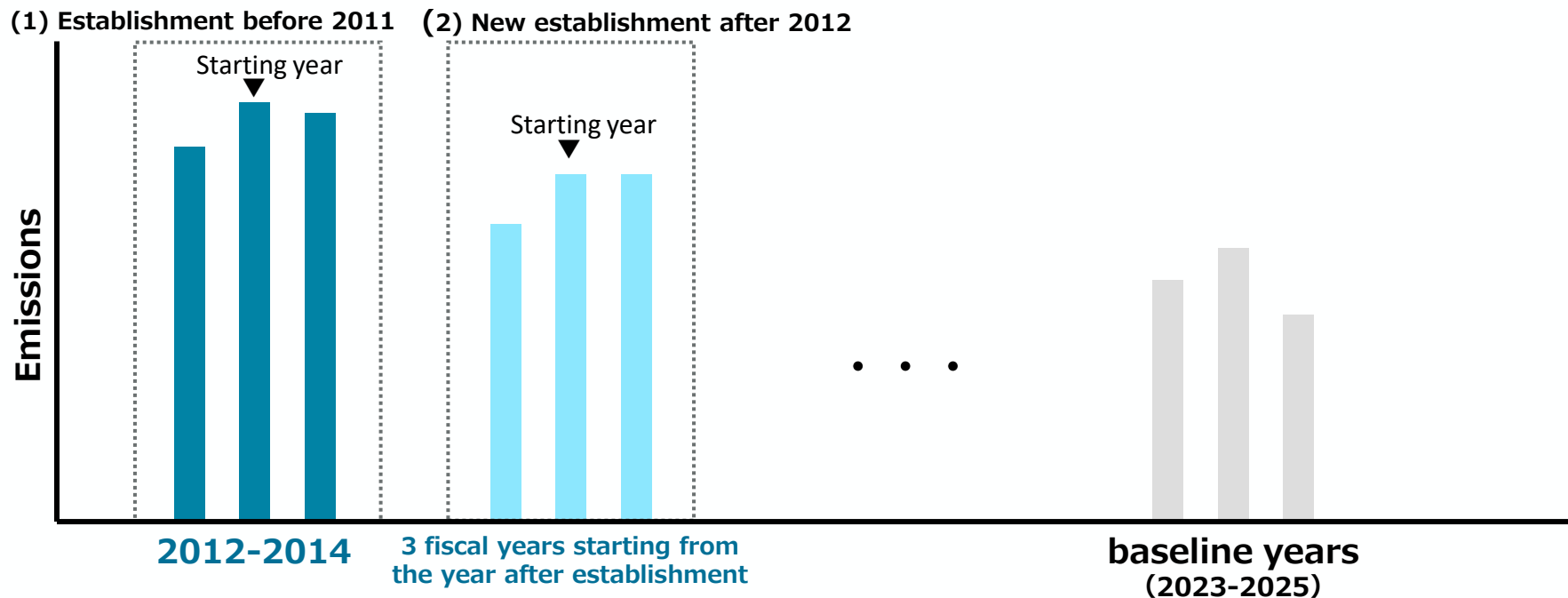


Key Issues

- (1) **Period of Past Efforts to be Accounted For**
 - How far back should we look when accounting for past emission reduction efforts?
- (2) **Verification Method for Past Performance**
 - Any additional allocation for past reductions will be subject to verification by a registered verification body. How can we verify the validity of past emission data?
- (3) **Accounting for Past Changes in Activity Level**
 - Allocations will be reduced for a decline in activity levels after the system launch, but how can we ensure fairness regarding past changes in activity levels?

(1) The starting year for Considering Past Reduction Efforts

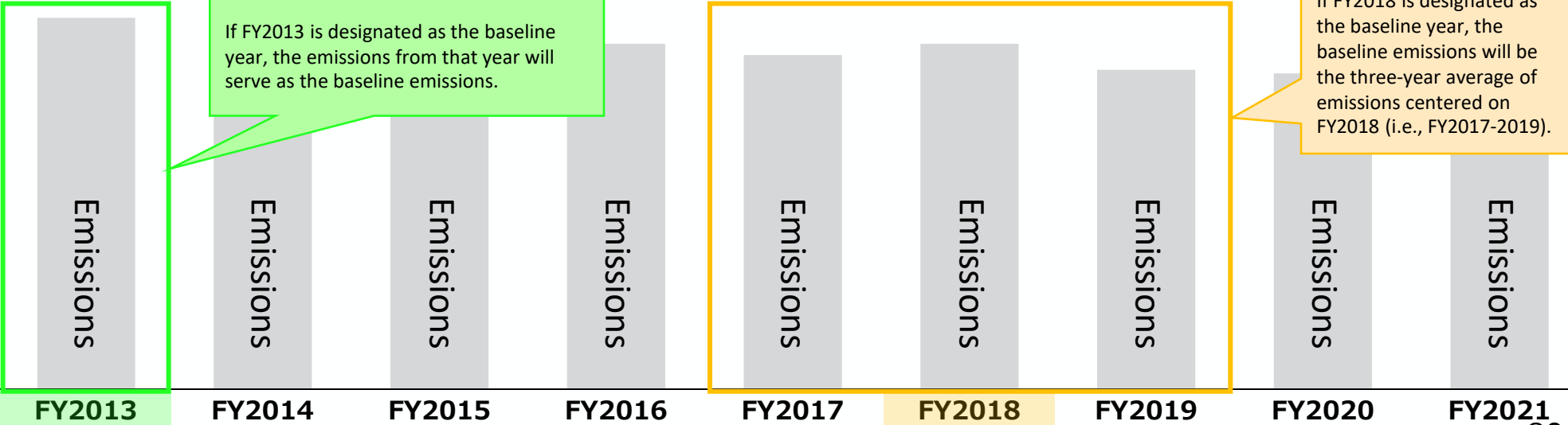
- To ensure fairness among participating entities, the starting year for calculating past reduction efforts must be consistent.
- Given that **the GX League's pilot emissions trading system generally used FY2013 as the baseline year, the starting year will be set as FY2013.**
- However, for facilities established in or after FY2012, the baseline year will be the second fiscal year following their establishment.
- In all cases, to maintain consistency with the concept of baseline years under grandfathering, **emissions for the starting year will be calculated as the average of three fiscal years including the year before and after the baseline year.**



[ref.] Generation of Excess Reduction Credits in the GX League

- Under the **GX League voluntary emissions trading system**, **the baseline year was generally set as FY2013**.
- However, since the system was designed to encourage companies to achieve self-imposed targets, setting the baseline year at any point between FY2014 and FY2021 was also permitted, based on each company's actual target-setting practices.
- In contrast, the new ETS calculates allocation amounts according to government guidelines to ensure greater fairness among participating entities. Therefore, **the starting year for assessing past reduction efforts** must also be determined in **a way that eliminates arbitrariness**.

<Conceptual Framework for Setting the baseline Year and Calculating baseline Emissions>

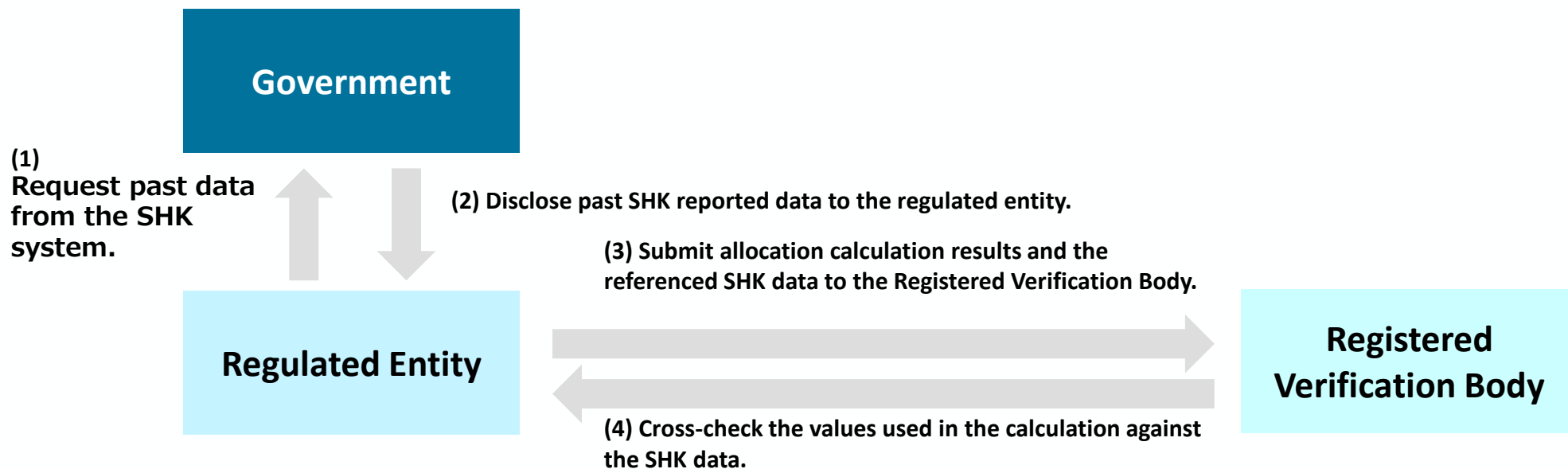


Source: Rules of the First Phase of GX-ETS (February 5, 2025)

(2) Method for Referencing Past Emissions Data

- While past emissions fall within the scope of confirmation by the Registered Verification Body, it is **often difficult to verify the validity of these calculations by reviewing original source documents from that period.**
- Therefore, we will refer to the historical emissions data **under the SHK system under the Act on Promotion of Global Warming Countermeasures, which reports baseline emissions of facilities subject to grandfathering,** as a data source with a reasonable degree of accuracy.

Process for Verifying Past Emissions Data



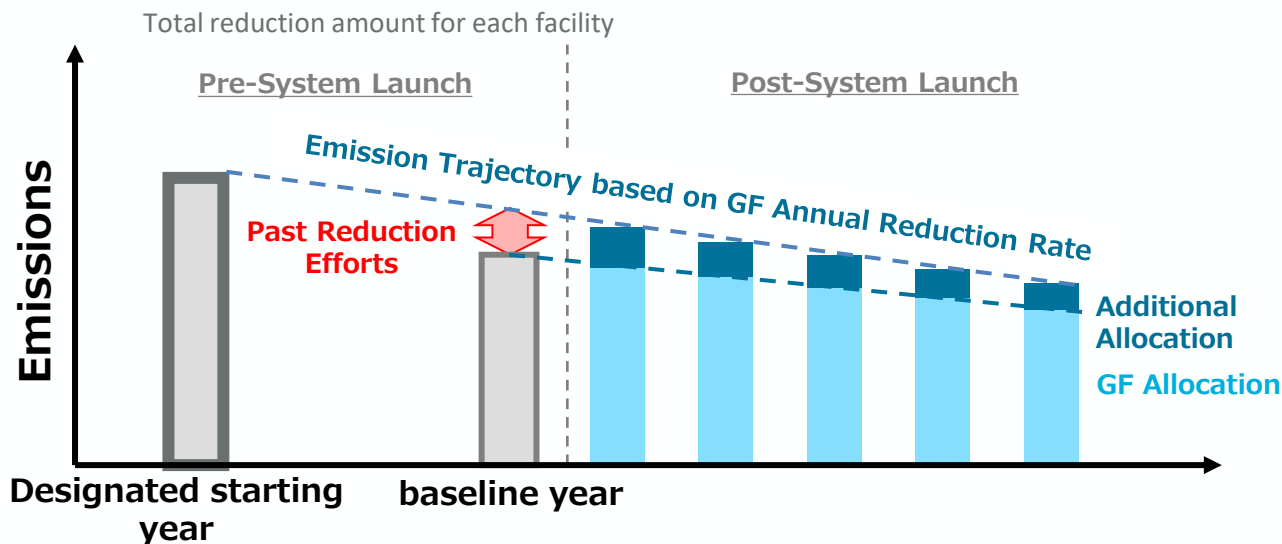
(3) Accounting for Past Changes in Activity Levels

- When calculating allowances based on data from the SHK system, it is difficult for a third party to retroactively verify the basis of past emissions. **This makes it challenging to distinguish actual reduction efforts** from reductions caused by factors such as **production cuts**.
- **Since allocations will be reduced if activity levels decrease after the launch of the system, failing to adjust for past reductions would create an inconsistency with the post-launch allocation method and compromise fairness.**
- Therefore, to account for **reductions since the designated starting year**, we will estimate a coefficient **to discount the portion attributable to decreased activity levels**, and this will be applied to the calculation for the allocation

Adjustment Accounting for Past Changes in Activity Levels

Past Reduction Efforts =

$\Sigma \{ (\text{Emissions in the starting year} \times (1 - (\text{GF Annual Reduction Rate} \times \text{Years Elapsed}))) - \text{baseline Period Emissions} \} \times \text{Activity Adjustment Coefficient}$



[ref.] Calculation Method for Early Reduction Allowances

- To account for changes in emissions **due to the establishment or closure of facilities**, past reduction amounts are calculated **for each facility**. These are then aggregated to determine the total "early reduction amount" for the regulated entity.

(1) Identifying eligible facilities

- Accounting for** past emission reductions at specific grandfathered facilities during the allocation period.

(2) Determining the starting year for calculating past reductions

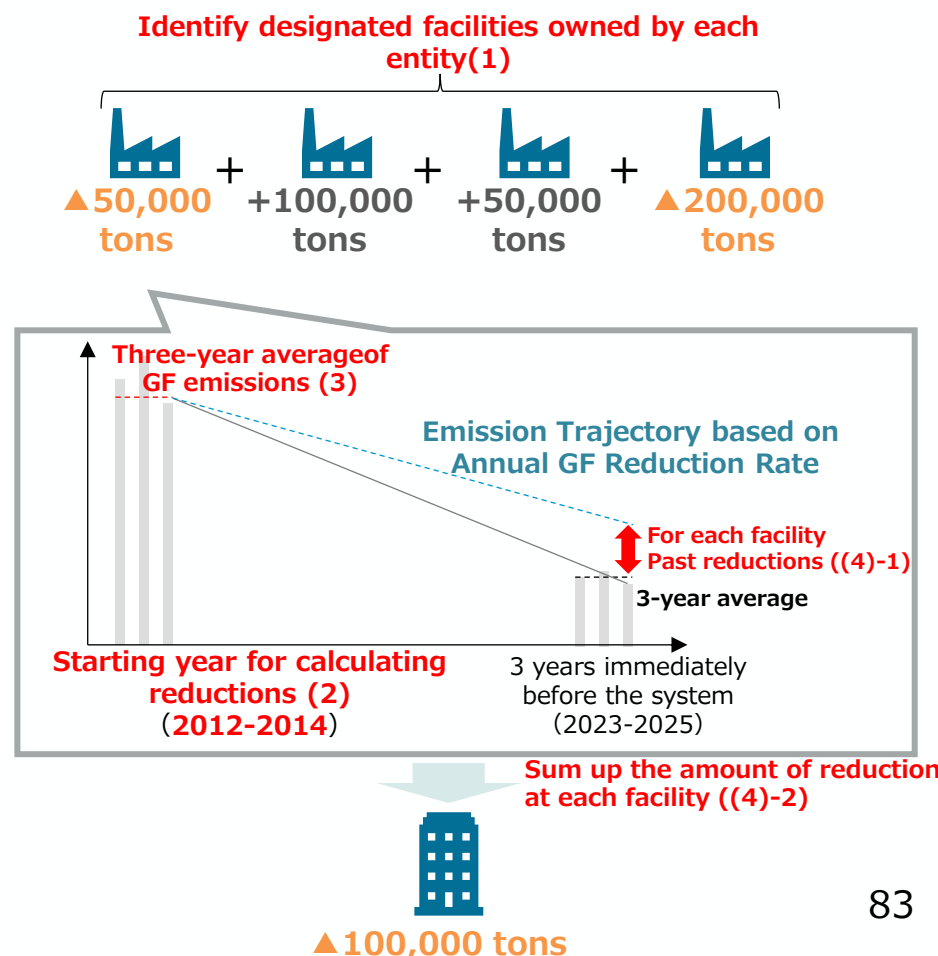
- For facilities designated as "special facilities" before FY2011
 - Average of the three years from **FY2012 to FY2014**
- For facilities designated as "special facilities" in or after FY2012
 - Average of three consecutive years **after the specified year**

(3) Calculating emissions per facility for the starting year

- Calculate past emissions of eligible facilities **by referencing data reported under the SHK system**.
 - Calculate the share of energy-related direct emissions (subject to GF allocation) within the values for the baseline years (2023-2025) reported in the SHK System.
 - Calculate allocations by multiplying the value reported in the SHK system for past years with the share of GF emissions mentioned above.

(4) Calculating the reduction

- Calculate emissions reduced beyond the GF level** starting from the designated starting year, **for each facility**.
- Sum the reductions across all facilities** to determine the company-wide past reduction amount.
- Multiply this amount by the factor $(1 - \text{GF reduction rate} \times \text{years elapsed since system start}) \times 0.8$ to determine the allocation.



6-2. Accounting for Leakage Risk

Key Issues in Design: Mitigating Carbon Leakage Risk

- Under the new GX-ETS, additional allocations will be granted to regulated entities in sectors deemed at risk of carbon leakage, provided they meet certain requirements.
- To operationalize this, the specific requirements for activating these measures and the level of additional allocation must be determined.

Approach to Leakage Risk Mitigation Measures

This measure applies to regulated entities which meet both of the following criteria:

- (1) Their main business is in **a sector identified as being at risk of carbon leakage**.
- (2) **The ratio of their cost of allowance procurement (allowance shortfall × average market price) to their revenue exceeds a certain threshold.**

➔ **A certain proportion of the shortfall** will be added to the allocation of the following year

Key Issues in Design

(1) Method for Identifying Sectors at Risk of Carbon Leakage

- A method for assessing the carbon leakage risk for each sector will be developed, referencing international systems such as the EU-ETS.

(2) Threshold for the Ratio of Allowance Procurement Costs to Revenue

- The eligibility criteria for this mitigation measure will be determined based on the financial impact on regulated entities, thereby accounting for their ability to bear costs.

(3) Additional allocation amount

- The amount of additional allocation will be determined so that it covers a portion of the allowance shortfall, while carefully balancing this against the need to maintain the overall impact of the ETS.

(1) Identifying industries at risk of carbon leakage

- **In Europe**, the definition of the carbon leakage sector is determined based on trade intensity as well as **indicators which account for the degree of carbon intensity**.
- In **Australia**, eligibility for baseline adjustments is **determined by trade share alone** and then **assessed using a metric of compliance cost per unit of revenue**. This approach ensures that carbon intensity is effectively factored in.
- **The new GX-ETS**, as in Australia, will account for the cost of procuring allowances per unit of revenue as a requirement for dispensing additional allocations. Accordingly, trade share will also be accounted for to identify sectors at risk of carbon leakage.
- The threshold for trade share in determining sectors at risk of carbon leakage will be set at 0.1.

Definition of leakage-risk sector in other countries (reposted)

	EU-ETS (Phase 4)	Australian Safeguard Mechanism
definition	<p>Trade intensity × carbon intensity > 0.2</p> <p>Trade intensity = (import value + export value) / (gross domestic product value + import value)</p> <p>Carbon intensity [kg-CO2/€] = emissions / gross added value</p>	<p>Trade share = (import value + export value) / domestic product value >0.1</p>

* If the trade intensity × carbon intensity is less than 0.2 and greater than 0.15, the decision will be made based on the reduction potential and market characteristics.

(2) Approaches for Determining the Specific Cost-to-Revenue Threshold

- The new GX-ETS is based on **free allocation**. While exceeding the free allocation will incur compliance costs, **some entities may gain surplus allowances under the same conditions and strengthen their competitiveness.** Therefore, **the fact that some entities will bear compliance costs will not necessarily lead to an immediate decline in Japan's overall industrial competitiveness or cause carbon leakage.**
- However, in the case of sudden events that do not allow for immediate responses—such as **production shutdowns due to cash shortages**—it may become **difficult to compensate for the lost production capacity within the country.**
- To address such **risks caused by cash shortages**, the threshold for revenue-based allowance procurement cost will be set with an eye on **short-term payment capacity** and will be **considered from the following two perspectives:**

(1) Increase in liquid assets relative to operating profit

- Focus on cash and other liquid assets relative to operating profit as an indicator of payment capacity.
- To understand the degree of payment flexibility each year, analyze the relationship between annual increases in liquid assets (such as cash) and operating profit.

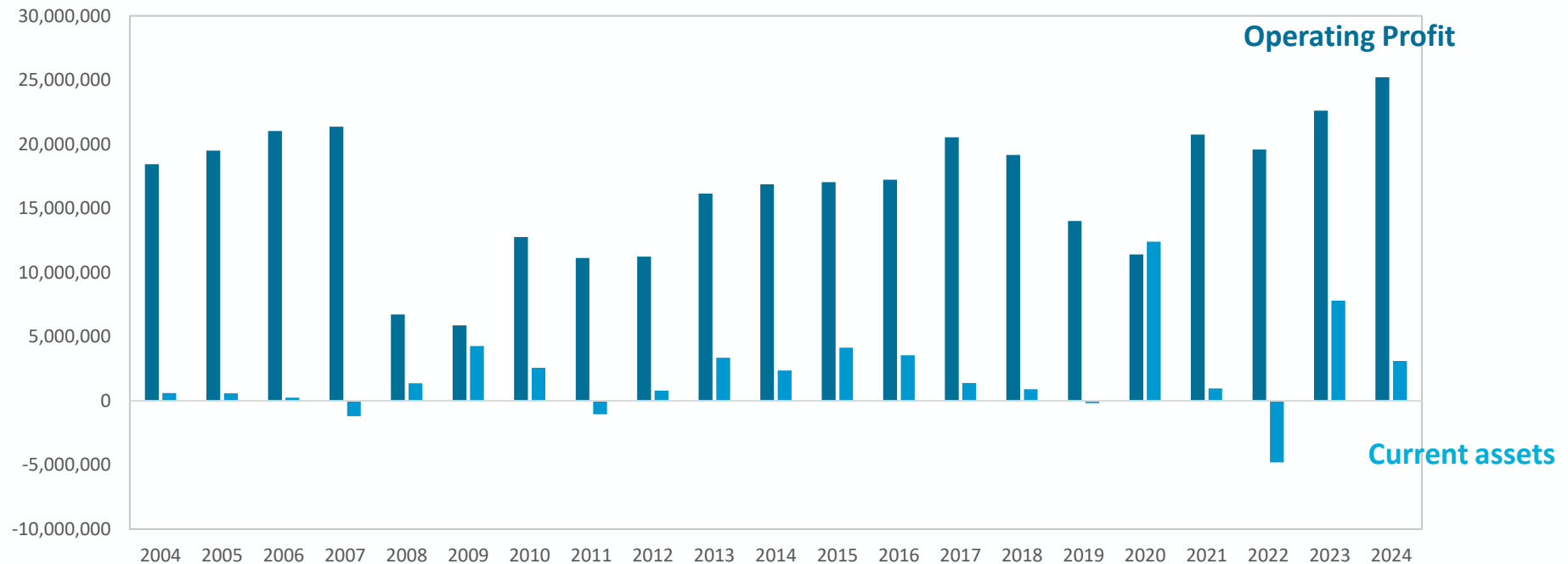
(2) Comparison with the growth rate of current liabilities

- Part of the cash and liquid assets identified in (1) will be reserved as payment capacity against current liabilities.
- To avoid significant impairments to the ability to meet current liabilities, compare the growth rate of current liabilities with the growth rate of cash holdings and determine an appropriate threshold level.

(1) Increase in cash and deposits etc. in relation to operating income

- The increase in current assets such as cash and deposits held by domestic manufacturers has averaged about 8% of operating profit over the past 20 years, excluding the fiscal years affected by the COVID-19 pandemic.

Operating income and current assets (flow)



* Current assets are the sum of cash, deposits, and temporarily owned securities.

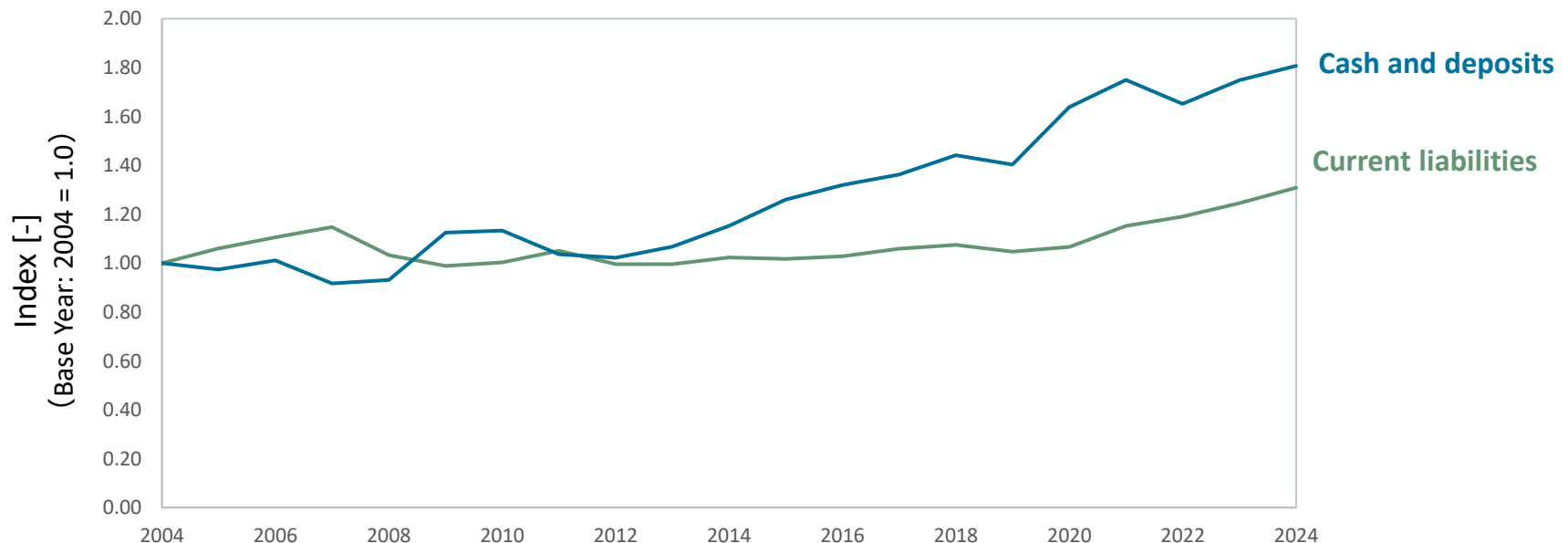
According to existing research, companies are thought to be holding surplus cash especially for preventive purposes such as "preparing for future unexpected investment projects" and "preparing for future cash flow shortages"

(Sasaki et al., Hyundai Finance NO.37, March 2016, 19-48).

(2) Comparison with the growth rate of current liabilities

- Over the past decade, domestic manufacturers' current liabilities have increased, but **cash and deposits have grown at roughly twice that rate.**
- Since **the security of short-term solvency** is typically assessed based on **the current ratio (current assets ÷ current liabilities)**, even if about half of the annual increase in cash and deposits were used to cover system-related costs, the impact on average solvency would be minimal.
- Therefore, **leakage-risk mitigation measures** shall be **applied when the cost of procuring emission allowances divided by operating profit exceeds 4%** (equivalent to half of the increase in cash and deposits relative to operating profit).

Relationship between cash and current liabilities



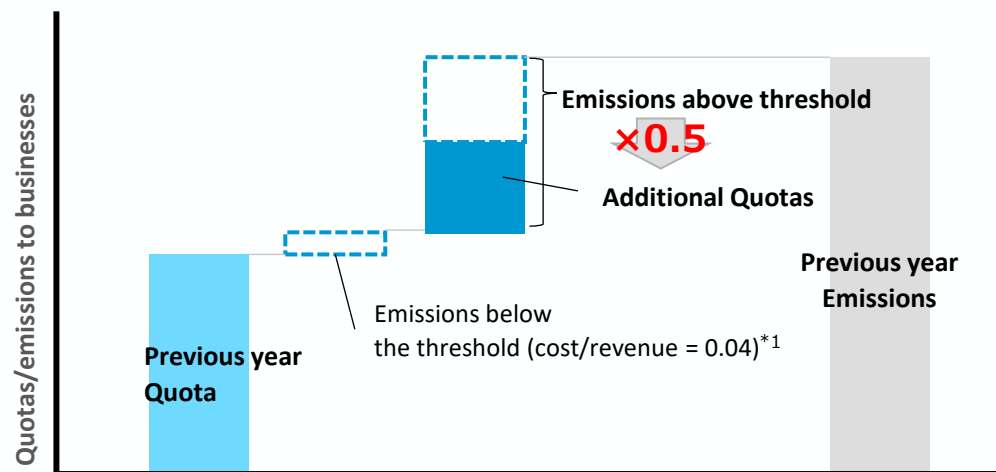
* Current liabilities include the total amount of bills payable, accounts payable, short-term borrowings, accounts payable, etc.

Source) Created by the secretariat based on the Corporate Statistical Survey (Manufacturing).

(3) Mitigation rate for emissions exceeding the threshold

- The **mitigation rate should** balance solvency and investment capacity of target businesses while **preserving incentives for investments in decarbonization technologies**.
- To ensure that the additional quotas do not exceed half of the emission shortfall, **the mitigation rate is set at 50%**.
- ETS incentives for businesses that cut emissions could weaken if the demand for emission allowances drops due to mitigation measures. However, **even under conservative assumptions**, the 50% mitigation **rate adds only 2-3% to total system emissions, so the overall impact on supply and demand remains minimal**.

Application of mitigation measures



※1 The amount of emission allowances required to be procured without multiplying the mitigation rate as below-threshold emissions varies depending on the operating income of each company. For example, in the case of a company with an operating profit of 50 billion yen, the figure would be 2 billion yen (calculated as the carbon price of the previous year). If the amount of operating profit is negative, the amount of the emission allowance that is insufficient would be multiplied by 0.5 to determine the allotment.

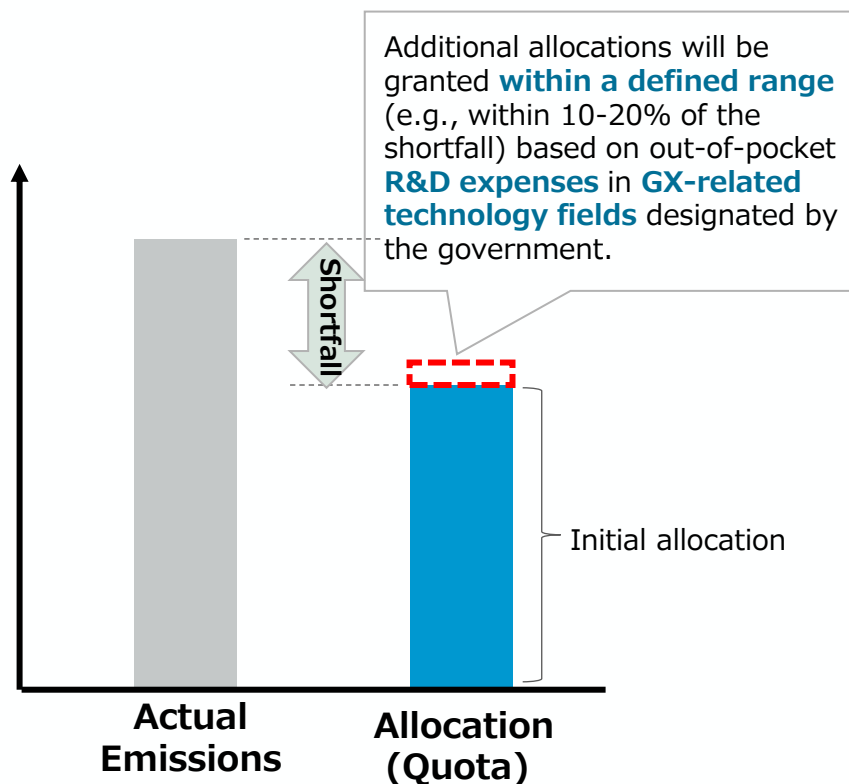
※2 In the figure above, the BM level is 1, the intensity of the operator with the smallest intensity in the industry is 0.5, and the intensity of the largest operator is 1.5, and the distribution of each company is uniformly distributed. The additional quota is calculated conservatively as an additional allowance of 0.5 times, and the shortfall is allocated uniformly in the event of a shortfall, without considering the cost/revenue threshold. Based on the reported values of the SHK system, it is thought that the proportion of manufacturing companies in the total emissions of the total number of people eligible for the system is about 40%, so the additional quota is calculated to be a maximum of 2.5%.

6 – 3 . Accounting for GX-related R&D Investments

Factoring in GX-related R&D investment: key issues

- When designing the program, it is essential to establish methods to identify GX-related R&D investments by participating entities and methods to calculate additional allocations linked to those investments, while also ensuring transparency and enforceability.

Additional emission allocation



Key issues in program design

(1) Identification of GX-related technologies owned by businesses

- Develop methods of identifying technologies held by businesses using publicly available, verifiable information.
- This requires a clarification of the definition of GX-related technologies, based on existing policies.

(2) Verification of associated R&D expenses

- Define procedures for identifying and verifying R&D expenses associated with the technologies above.

(3) Calculation method of additional allocations

- Explore methods of determining allocation size as a function of the amount of R&D investment.

(1) Identifying GX technologies owned by businesses

- Identifying GX-related technologies owned by businesses using publicly available information is key to ensuring transparency.
- Patent information and similar sources will serve as key public information related to R&D activities.

Patent information platform: J-PlatPat

English page:

<https://www.j-platpat.inpit.go.jp/p0100>

Patent/Utility Model Search Help

You can retrieve patent/utility model publications, foreign documents, and non-patent documents by using keywords in bibliographies, abstracts, and claims, as well as classifications (FI/F-terms, IPC), etc.
Enter a document type and a search keyword to search. (An OR search is performed when you separate search keywords with a space.)
For more information about classification information, see [Patent/Utility Model Classification Search \(PMGS\)](#).
Filter search is also available by using the previous search result. For the search history number, please check from the search history tab.
To search by specifying the search history number, set the Document types setting for Domestic Documents or Foreign Documents to the same setting as the previous search.

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Search keywords
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Keyword: Enter search query here
Proximity Search

Exclusion keywords Specify a keyword to exclude from the search result. Open

Search for patent ownership and application status in related fields here.

[ref.] GX Technology Classification Table

- The Japan Patent Office has developed a GX Technology Classification Table to showcase GX-related initiatives taken on by businesses.
- GX-related technologies owned by businesses can be identified by entering search formulas defined for each technological category into the patent information platform.
- The search formulas allow for an objective evaluation of GX-related technologies.

GX1			Search on J-PlatPat
Level 1	Level 2	Level 3	
gA	Energy Supply		
	01 Solar Photovoltaic Power Generation		
	a Solar Photovoltaic Power Generation	patA1a(External Link)	
	02 Solar Thermal Energy Utilization		
	a Solar Thermal Power Generation	patA2a(External Link)	
	b Solar Thermal Collectors, Solar Thermal Systems	patA2b(External Link)	
	03 Wind Power Generation		
	a Wind Power Generation	patA3a(External Link)	
	04 Geothermal Utilization		
	a Geothermal Power Generation	patA4a(External Link)	
	b Geothermal Collectors, Geothermal Systems	patA4b(External Link)	
	05 Hydro Power Generation		
	a Hydro Power Generation	patA5a(External Link)	
	06 Ocean Energy Power Generation		
	a Wave Power Generation, Tidal Power Generation	patA6a(External Link)	
	b Ocean Thermal Energy Conversion, Ocean Salinity Gradient Power Generation	patA6b(External Link)	
	07 Biomass		
	a Solid Biofuels	patA7a(External Link)	
	b Liquid Biofuels	patA7b(External Link)	
	c Biogas	patA7c(External Link)	
	08 Nuclear Power Generation		
	a Fusion Reactors, Nuclear Reactors, Nuclear Power Plant	patA8a(External Link)	
	09 Fuel Cells		
	a Fuel Cells, Fuel Cell Systems (Stationary, Mobility)	patA9a(External Link)	
	10 Hydrogen Technology		
	a Hydrogen Production	patB1a(External Link)	
	b Hydrogen Storage, Transportation, Supply, Hydrogen Stations	patB1b(External Link)	
	c Use of Hydrogen in Combustion (Hydrogen Engine Vehicles, etc.)	patB1c(External Link)	
	11 Ammonia Technology		
	a Ammonia Production	patB11a(External Link)	
	b Ammonia Storage, Transportation	patB11b(External Link)	
	c Use of Ammonia in Combustion	patB11c(External Link)	

gB		
	01 Energy Saving in Buildings (ZEB, ZEH, etc.)	
	a Building Insulation	patB2a(External Link)
	b High Efficiency Air Conditioner	patB2b(External Link)
	c High Efficiency Water Heaters	patB2c(External Link)
	d High Efficiency Lighting (LEDs, OLEDs)	patB2d(External Link)
	02 High Efficiency Motors and Inverters	
	a High Efficiency Motors and Inverters	patB3a(External Link)
	03 Combined Heat and Power (CHP)	
	a Combined Heat and Power (CHP)	patB4a(External Link)
	04 Energy Saving and Supply/Demand Flexibility in Treatment of Water, Wastewater, Sewage, and Sludge	
	a Energy Saving and Supply/Demand Flexibility in Treatment of Water, Wastewater, Sewage, and Sludge	patB5a(External Link)
	05 Electromobilities	
	a Electric Vehicles, Hybrid Vehicles	patB6a(External Link)
	b Others (Aircraft, Ships, etc.)	patB6b(External Link)
	06 Electrification of Industrial Heat	
	a Resistance Heating, Infrared Heating	patB7a(External Link)
	b Induction Heating	patB7b(External Link)
	c Electromagnetic Heating (Microwave Heating, Dielectric Heating)	patB7c(External Link)
	d Electric Discharge Heating	patB7d(External Link)
	07 Power Transmission and Distribution, Smart Grids	
	a Direct Current Transmission and Distribution (HVDC, etc.)	patB8a(External Link)
	b Smart Grids	patB8b(External Link)
	08 Demand Supply Flexibility of Power Systems	
	a VPP, Negawatt, Resource Aggregation	patB9a(External Link)
gC	Batteries, Energy Storage	
	01 Secondary Batteries	
	a Secondary Batteries	patC1a(External Link)
	b Module-Related Technology for Secondary Batteries	patC1b(External Link)
	02 Mechanical Energy Storage	
	a Pumped Storage Power Generation, Flywheels, Compressed Air Energy Storage	patC2a(External Link)
	03 Thermal Energy Storage	
	a Thermal Storage Devices, Thermal Storage Materials (Including Carbon Batteries)	patC3a(External Link)
	04 Electric Double Layer Capacitors, Hybrid Capacitors	
	a Electric Double Layer Capacitors, Hybrid Capacitors	patC4a(External Link)

gD		
	01 Chemical Production from Biomass	
	a Biomass Plastic	patD1a(External Link)
	b Cellulose Nanofibers	patD1b(External Link)
	c Production of Chemicals from Biomass	patD1c(External Link)
	02 Reduction of CO2 Emission in Steelmaking Process	
	a Hydrogen Reduction Steelmaking	patD2a(External Link)
	b Direct Reduced Iron (DRI)	patD2b(External Link)
	c Highly Reactive Coke	patD2c(External Link)
	d Electrolytic Reduction Method	patD2d(External Link)
	03 Recycling	
	a Plastic Recycling	patD3a(External Link)
	b Iron Recycling	patD3b(External Link)
	c Aluminum Recycling	patD3c(External Link)
	d Copper Recycling	patD3d(External Link)
gE	Capture, Storage, Utilization and Removal of Greenhouse Gas	
	01 CCS, CCUS, Negative Emission	
	a CO2 Separation by Absorption	patE1a(External Link)
	b CO2 Separation by Adsorption	patE1b(External Link)
	c CO2 Separation by Membranes	patE1c(External Link)
	d DAC (Direct Air Capture)	patE1d(External Link)
	e Oxy-fuel Combustion, Chemical Looping	patE1e(External Link)
	f Underground Storage of CO2, Effective Use of underground CO2 Injection	patE1f(External Link)
	g CO2 Fixation as Carbonates (Concrete, etc. and Blast Furnace Slag)	patE1g(External Link)
	h CO2 Absorption and Fixation by Organisms (Forest, Agricultural Soil Carbon, Urban Greening, Marine Biological Systems)	patE1h(External Link)
	i CO2 Conversion into Hydrocarbons and Derivatives by Reduction (Methanation, Electrosynthesis, Carboxylation, Artificial Photosynthesis, etc.)	patE1i(External Link)
	02 Green Refrigerants (Low GWP Refrigerant)	patE2a(External Link)
	03 Reduction of Non-CO2 Greenhouse Gases from Livestock and Agricultural Land	patE3a(External Link)

<https://www.jpo.go.jp/e/resources/statistics/gxti-gaiyo.html>

※ The GX Technology Classification Table was created by selecting technologies that are considered to have a significant greenhouse gas reduction effect after discussions at a study group consisting of the following six external experts.

Keigo Akimoto (RITE Systems Research Group Leader and Principal Researcher), Koji Oyama (Fellow, JST R&D Strategy Center), Michihisa Furuyama (Professor, Shinshu University), Kenji Tanaka (Associate Professor, Graduate School, The University of Tokyo), Hideyuki Doi (Director of Energy Technology Research, ENEOS Research Institute (Former Director of NEDO Environment and Chemistry Unit)), Takao Nakagaki (Professor, Waseda University)

[ref.] Structure of the search formula

- The search formula in the GX Technology Classification Table is comprised of the International Patent Classification (IPC) code and text used for invention title, abstract, or claims.

Search Formula for the GX Technology Classification Table

技術区分表			検索式	【参考】検索式 (和文テキスト)	
大区分	中区分	小区分	No.	IPC	× テキスト (発明の名称、要約、特許請求の範囲)
	03	風力発電			
		a	風力発電		
			検索式①	F03D	× なし
			検索式②	B60L53/52	× なし
			検索式③	B60L8/	× 風力,5n,発電
			検索式④	H02S10/12	× なし
			検索式⑤	G06F113/06	× なし

Search formula specification:

- IPC code F03D, B60L53/52, H02S10/12, or G06F113/06;
- alternatively, IPC code B60L8/ with the invention title, abstract, or claims containing 'wind power' and 'generation' within five words of each other, regardless of order.

Public information on J-PlatPat

Application No. (International Application No.): Special Application 2022-120078

Public Application No.: Special Application No.: Special Application 2022-136246

Application Date: July 28, 2022

Published Date (Published Date): September 15, 2022

Abstract (Abstract): [Challenge] Provide electric vehicles with increased utilization value. Solution: This electric vehicle 1 is equipped with solar power generation means 21, wind power generation means 22, vibration power generation means 23, temperature difference power generation method 24, and rainwater power generation method 25 as electricity supply method 2 for storage battery 4.

Claim (Abstract): An electric vehicle that runs on electricity stored in a storage battery as a power source, and is characterized by having a method of supplying electricity to the storage battery, a method of solar power generation, a method of wind power generation, a method of vibration power generation, a method of temperature difference power generation, and a method of rainwater power generation.

IPC (抄):

B60L8/00 (2006.01)

Applicant must state (Text requirements: The letters "wind power" and "power generation" must be in no particular order and must be within 5 words.)

The Patent Office shall grant it upon examination (IPC requirement: "B60L8/").)

(2) Verification of associated R&D expenses

- Companies typically link patents to the R&D projects that led to the invention.
- The costs for an R&D project will be considered a GX-related R&D expense subsequent to identifying the project related to the patent.
- Upon obtaining third-party verification of the expenses, businesses must submit a formal statement from the third party as well as documentation proving the link between the patent information and the R&D project.

Evidentiary materials for the calculation of R&D expenses

(1) Application information corresponding to the GX technology category

- Copy of published application information

(2) Evidence of the link between the R&D project and the application information.

- Approval materials, etc. that outline the R&D project (including keywords in the search formula for the GX technology category)
- Information on internal intellectual property management (information that can confirm the link between the applied patent and the R&D project)

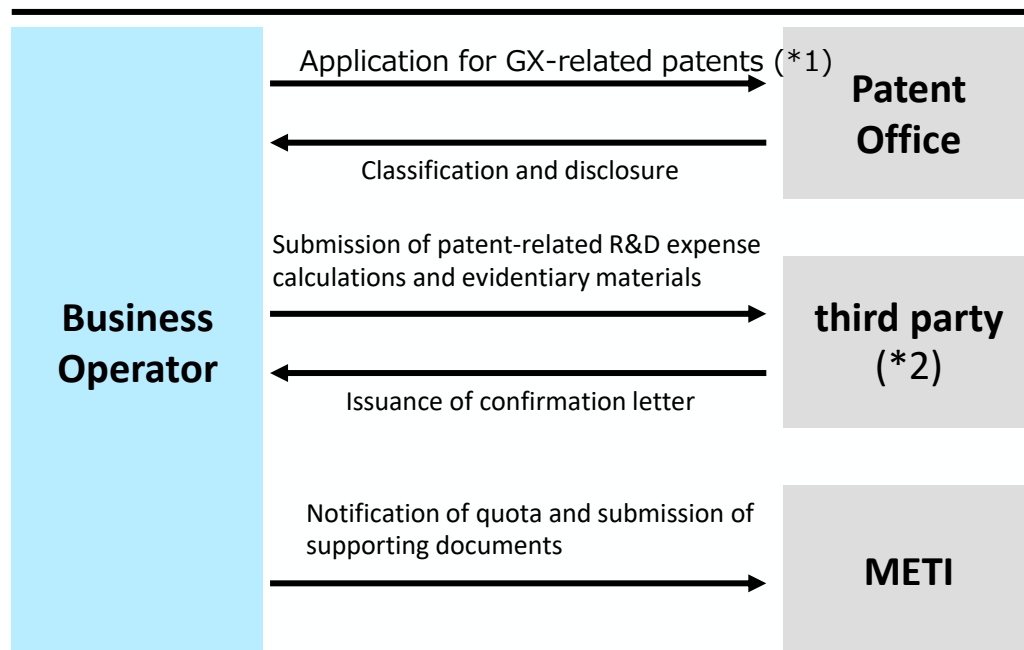
(3) Applicable R&D project expenses

- R&D expenses for the previous year recorded in accordance with accounting standards

(4) Confirmation letter from a third party

- Confirmation of the appropriateness of costs

Verification Procedure



*1 Applications from the previous year that were filed by the end of December are eligible. When filing an application, the business operator makes a request for publication to shorten the time until publication.

*2 Assuming a different entity from the registration confirmation agency.

[ref.] Accounting standards for R&D expenditures

- The scope of R&D expenditure is defined in accounting standards.

Practical Guidelines for R&D Expenses and Software Accounting (ASBJ)

Scope of Research and Development

2. Under the *Accounting Standard for Research and Development Costs*, "research" is defined as *planned investigation and inquiry aimed at discovering new knowledge*, while "development" is defined as *the process of materializing research results and other knowledge into plans or designs for new products, services, or production methods (hereinafter referred to as "products, etc."), or plans or designs intended to significantly improve existing products, etc.*

Typical examples of research and development activities include the following:

1. Investigation and inquiry to generate ideas for products or services that did not previously exist.
2. Activities undertaken to commercialize or operationalize new knowledge obtained through research.
3. Materialization of manufacturing methods that create significant differences compared to existing products.
4. Materialization of methods for using raw materials or manufacturing components that differ from conventional practices.
5. Materialization of new ways of using existing products or components.
6. Materialization of new ways of using tools, jigs, molds, and similar items.
7. Design, production, and testing of prototypes for new products.
8. Planning for the design and construction of pilot plants intended for commercial production.
9. Technical activities to manufacture marketable products based on acquired patents.

The scope R&D expenses eligible for additional allocation

- For measures related to **R&D investment**, we will rely on objectively verifiable information such as patent data in order to ensure transparency of the system
- To allow for a broader range of initiatives, **the self-funded portion of R&D expenses under national GX programs** will be **included as costs that are eligible for adjusted allocations (re-calculated) without requiring patent verification.**
- Specifically, this **applies to self-funded portions of R&D projects supported through the Green Innovation Fund.**

Green Innovation Fund

[Overview]

- In order to achieve carbon neutrality by 2050, in March 2021, NEDO established a fund of 2 trillion yen (currently 2.8 trillion yen).
- Provides continuous support for up to 10 years—from R&D and demonstration through to social implementation—for companies that share ambitious and concrete goals with the public and private sectors and treat these efforts as a top management priority.
- Has funded 20 projects to date.

[Main business]

- ① Hydrogen reduction steelmaking significantly reduces CO2 emissions
- ② Perovskite solar cells, a next-generation solar cell from Japan
- ③ Liquefied hydrogen carriers transporting hydrogen in large quantities
- ④ Ammonia-specific firing that greatly contributes to decarbonization in Asia and other countries
- ⑤ Next-generation solid-state batteries, etc.

Progress of the Green Innovation Fund

- To achieve 2050CN, we will establish a fund of 2 trillion yen (currently about 2.8 trillion yen) to support companies that are working on the most important issues for up to 10 years, focusing on the development of innovative technologies and social implementation.
- **20 projects have been formed to date, and more than 2 trillion yen has been earmarked for support recipients.**
- Progress has been made in the development of world-class technologies in the fields of
 - ✓ **Hydrogen-reduction steelmaking that significantly reduces CO2 emissions,**
 - ✓ **Perovskite solar cells,** which are next-generation solar cells originating in Japan,
 - ✓ **Liquefied hydrogen carriers** that transport large quantities of hydrogen,
 - ✓ **Ammonia mono-firing,** which greatly contributes to decarbonization in Asia and other regions, and
 - ✓ Next-generation **solid-state storage batteries.**

Hydrogen reduction blast furnace

- In an existing blast furnace (5,000 m³ scale), demonstration will be conducted utilizing the results of technological development to date. The company aims to achieve **a CO2 emission reduction rate of 30%** or more by 2030.
- In December 2024, **a CO2 reduction rate of 43% was achieved** by directly injecting high-temperature hydrogen into a test blast furnace (12 m³).
- The industry as a whole aims to supply green steel as soon as possible.



Source: Nippon Steel Cooperation

Perovskite solar cells

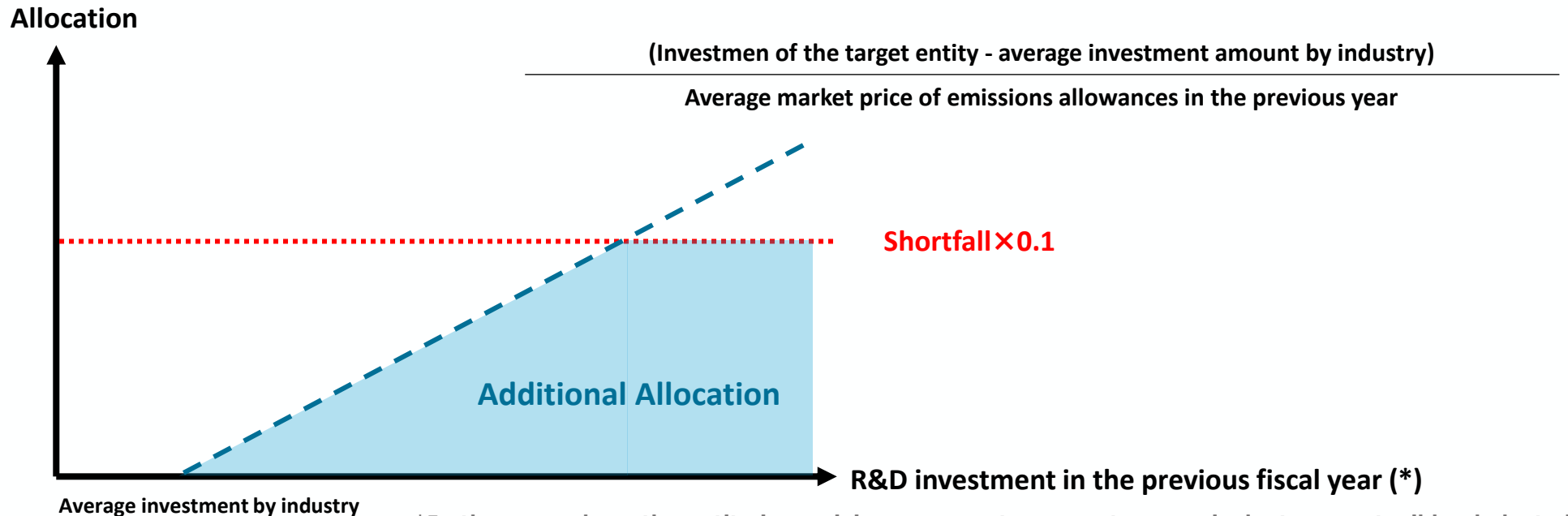
- **A 30 cm wide roll-to-roll manufacturing process has been constructed,** and mass-production technology achieving a durability equivalent to 10 years and a power generation efficiency of 15% has been established. It aims to establish mass production technology for **1 m width and improve conversion efficiency and durability.**
- In addition, the company will utilize support for manufacturing facilities to aim to build a GW-class mass production system as soon as possible, before the 2030 target.



Source: SEKISUI CHEMICAL CO., LTD

(3) Calculation method for additional allocations

- This measure is intended as a preferential allocation for businesses making proactive investments in innovation. Therefore, it will apply only to **businesses whose R&D investment exceeds the industry average**. The additional allocation will be calculated **by dividing the difference between the company's R&D investment and the industry average by the allowance price**.
- Furthermore, **to allow for this to be applied simultaneously with the aforementioned additional allocation for carbon leakage risk**, and to continue encouraging current reduction efforts, **the upper limit for this allocation will be set at 10% of the shortfall in allowances**.



*In the case where the entity is receiving government support, an equivalent amount will be deducted.

[ref.] Standard R&D expenditure levels in the GX field

- The standard for the average R&D investment used in the calculation shall be determined using an indicator that compares research expenditure to sales, and calculated by multiplying this with the sales of each company.
- In order to account for differences in profit structure, etc, relevant standards shall be determined for each of the following industries.

Industry	Standards for GX-related R&D expenses per unit of sales (draft)
Manufacturing industry	0.50%
Energy transition	0.10%
Transportation industry	0.02%
Other	0.04%

*Based on industry ratios of R&D expenditure to sales and the share of energy- and environment-related fields in total R&D, using data from the 2024 Science and Technology Research Survey (Statistics Bureau of Japan).

[ref.] Measures to enhance transparency

- From the perspective of increasing the transparency of the system and the commitment of operators, the status of GX-related R&D will be described in the transition plan and shared with companies that receive the allocation.

Disclosure requirements for businesses subject to the allocation of emission allowances

(1) List of application information

- List of GX-related patent application information (for previous year's applications) published on the Patent Information Platform

(2) GX technology field engaged in research and development

- GX technology classification corresponding to the above application

(3) R&D expenses in the field of GX technology

- The total amount of R&D expenses that will be used as the basis for calculating the allocation (the sum of all R&D PJ expenses associated with the above applications.)

(4) Positioning of related technologies

- Positioning of the above technologies in the transition plan to achieve carbon neutrality

7. Transition plan

Contents of the Transition Plan

- From the perspective of enhancing the investment impact of the introduction of the ETS, the Transition Plan will require the submission of specific investment and other plans every fiscal year, and make them public.
- In addition, for entities filing notifications jointly with closely-related parties, or those intending to receive allocations based on the status of GX-related R&D, these measures require the inclusion of specified items in the transition plan, among other requirements.

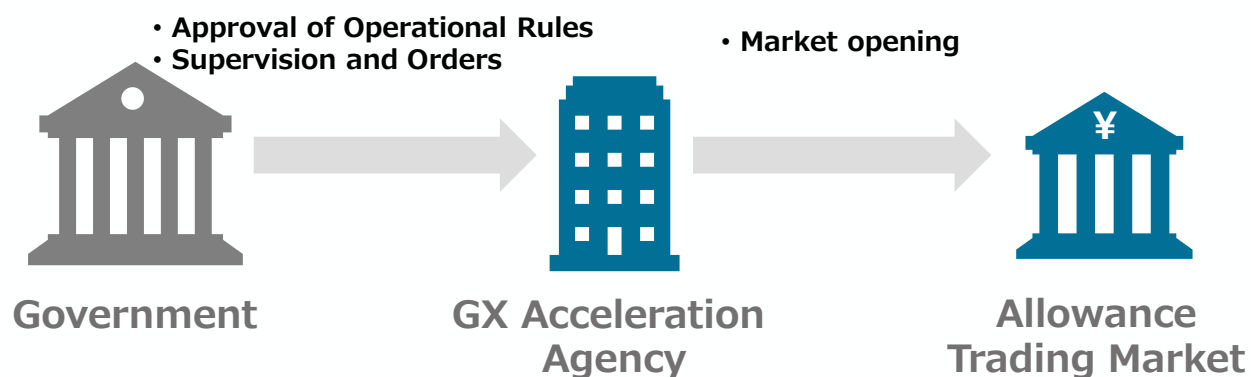
	item	Public/ Non-public	[ref.] Related disclosure items in the GX League
1. Projected emissions (targets) for FY2026–2030	① Direct emissions ② Indirect emissions ③ Total	○ *Only for FY2030	Set and disclose targets for FY2025 and FY2030
2. Emissions	① Direct emissions ② Indirect emissions ③ Total	○	Disclose annual results
3. Capital Investment Plans and Results	① Reduction measures to be implemented ② Applicable facilities, etc. ③ Timing ④ Decarbonization effect (t-CO2/year)	× *Submission only.	—
4. Status of R&D investment *Listed only when receiving additional allocations.	① Application info for GX-related patents (application number, etc.) / Implementation status of GI Fund projects ② GX technology category corresponding to 4.① ③ Total R&D expenses related to 4.①	○	Disclose status of innovation investment, etc.
5. Other Initiatives	① Public documents detailing strategies for Carbon Neutrality (e.g., Medium-term Management Plan) ※ If the entity is a recipient of additional allocation from R&D, a description of the status of initiatives related to the technology category in 4.(2) are also required. In addition, when filing jointly with close stakeholders, they must be included in the organizational boundary of the above public documents.	○	Publish a transition strategy

8. Allowance Trading Market

(Considerations for FY2026)

Design of the ETS market

- Under the GX Promotion Act, the Allowance Trading Market is to be **established and operated by the GX Acceleration Agency**, with the **opening scheduled for around autumn of FY2027**.
- Since allowance prices serve as critical information for companies making decarbonization investment decisions and they also act as triggers for institutional measures such as reverse auctions, a fair price disclosure function in the market is extremely important.
- To develop a smooth trading environment, the government, in coordination with the GXA, will consider setting **requirements for market participants**, **detailed trading procedures**, **measures to ensure fair trading**, and **other necessary measures to ensure liquidity**.



The Role of the Trading Market

- Fair execution of transactions
- Provision of settlement functions
- Disclosure of transaction volumes, prices, etc. (Including possible outsourcing of some operations)

Trading participants

- ① Regulated entities
- ② Specified trading operators*
 - Those trading upon request from regulated entity
 - Experienced entities in market trading of products such as credits similar to allowances (market makers ,etc.), etc.

*Details will be stipulated in the forthcoming Operational Rules by the GXA.

[ref.] Approach to Rules Regarding Allowance Trading

- In establishing and operating the ETS market, it is necessary to consider ideal trading discipline from the perspective of realizing fair trade.

Summary of the draft report of the "Study Group on Legal Issues Contributing to the Study of the Emissions Trading System for the Realization of GX" (excerpt)

3. Approach to Addressing Unfair Trading Practices

- **Prohibition of Market Manipulation**

Since forming a **fair carbon price** in the market is a key objective, **applying regulations against market manipulation is essential**. Prohibiting activities that could lead to market manipulation is critical from the earliest stages of its establishment as fair trading is essential for healthy markets.

- **Insider Trading Regulation**

For emission allowances, although there is a view **that regulations may not be strictly necessary since there is no issuer as in the case of stocks, the existence of material non-public information is a concern**. In the EU, **insider trading regulations have been introduced for transactions related to emission allowances**. Some have pointed out that **if insider trading rules are not established, Japan's emissions trading system may be perceived as lacking international credibility**.

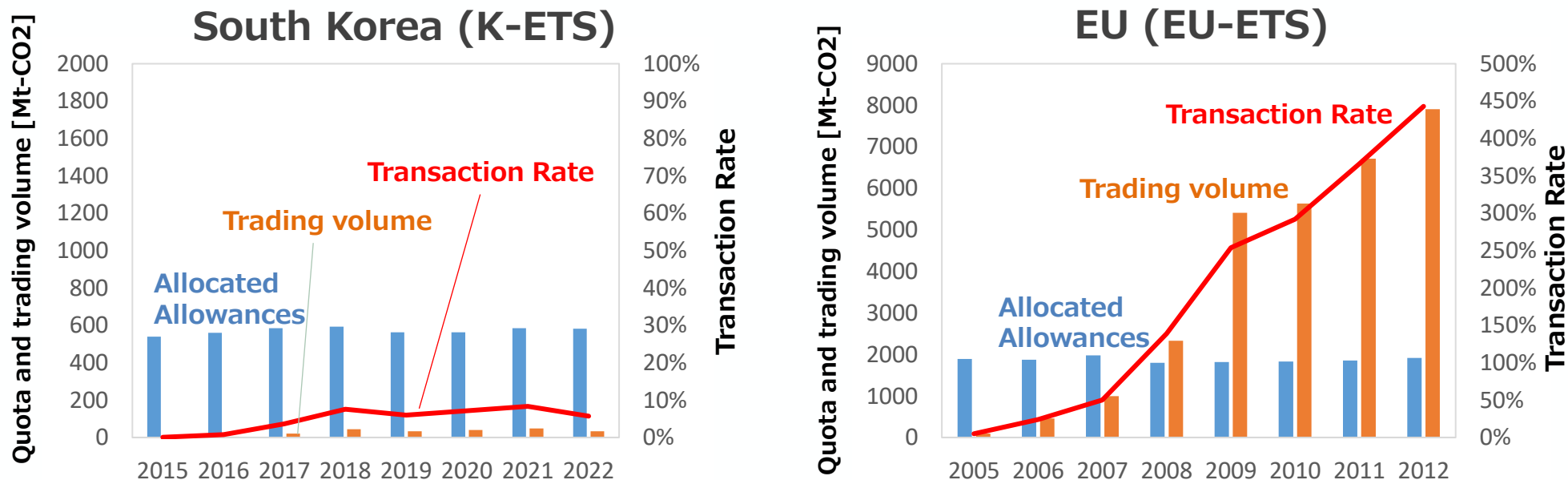
- **Form of Regulation**

Regarding **electricity trading**, insider trading regulations are implemented through the business rules of the exchange **and not legal frameworks**. Given that **insider trading regulations lack legal backing despite electricity, which is difficult to store by nature and whose price is sensitive to information about supply and demand, enforcing rules at the business level may prove sufficient in the case of allowance trading**.

[ref.] Liquidity of the ETS

- Based on precedents such as South Korea (K-ETS) and the EU (EU-ETS), the **liquidity and volume of trading at the earliest stage of the ETS may be limited.**
- To ensure the effective operation of the market's **price disclosure function** and to **achieve cost-effective, economy-wide emission reductions, it is particularly important to take measures to enhance market liquidity in the initial phase of the ETS.**

Trading volume of allowances since system launch



*Allocated allowances refer to the final amount allocated for each fiscal year. Trading volume is the total of transactions from auctions, secondary markets, and over-the-counter (OTC) trades. The trading rate is the trading volume divided by the allocated allowances.

Source: Greenhouse Gas Inventory and Research Center "2023 Korean Emissions Trading System Report" European Commission, https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/development-eu-ets-2005-2020_en

Consideration of Measures for Market Activation

- In South Korea, **measures to vitalize the allowance trading market**, such as the **introduction of market makers**, **restrictions on banking**, and **expansion of market participants**, have been implemented in stages.
- Concerns have also been raised in this subcommittee that there is a risk that allowance prices may surge to the upper limit in the initial phase of Japan's ETS. Given these precedents, the government, in FY2026, will conduct concrete examinations on measures to curb price spikes caused by low market liquidity, including measures to limit excessive banking.

History of Regulatory Revisions in the Korean (K-ETS) Allowance Market



Phase 1 (2015-2017)

- **Only regulated entities could participate in market trading.**
- **Trading frequency was low**, with transactions concentrated in specific periods.

Phase 2 (2018-2020)

- To improve market liquidity, **a market maker system was introduced** (2 banks were designated).
- **Banking was restricted** to increase the amount of allowances sold in the market.

Phase 3 (2021-2025)

- To further improve liquidity, **market participation was permitted for securities firms etc.** (21 entities) as well as **additional market makers** (5 entities).
- Against the backdrop of low allowance prices, a "Plan for Vitalizing the Allowance Trading Market" was compiled, introducing **further expansion of the market** and **easing of banking restrictions**.
- The opening of a **trading market for derivatives** is also being planned.

9. Further Directions for Development

(1) Calculation of emissions and verification by Registered Verification Bodies

(1) Calculation methods

- The details of calculation methods will be reviewed as necessary, in coordination with related systems such as the SHK System (Act on Promotion of Global Warming Countermeasures) and the Act on the Rational Use of Energy.
- Activities such as emission avoidance/reduction via CCS/CCU and CO₂ removal/absorption via forests/DACCS will be considered for inclusion, based on SHK discussions and contingent on the establishment of schemes ensuring objectivity and accuracy—for example, through the incorporation of reduction/absorption values via J-Credits and certificates, and through the establishment of verification procedures by Registered Verification Bodies.
- Requirements for the accuracy of measurement equipment and reporting items will be reviewed to refine measurement methods, while taking into account the practical conditions of business operators.

(2) Treatment of carbon credits

- The impact on supply and demand—including the surplus/shortage of allowances and trends in credit generation—will be continuously monitored. The usage cap for carbon credits will be reviewed if necessary.

(3) Confirmation by Registered Verification Bodies

- Verification at the reasonable assurance level will be required for large-scale facilities from FY2029 onwards. The threshold for facility scale will be determined based on annual CO₂ emissions of approximately 1 million tons or more.
- Registered Verification Bodies will be required to obtain objective qualifications. The timing for this requirement may be accelerated depending on the private sector's capacity to obtain such qualifications.
- Initiatives for quality improvement and human resource development will be promoted to secure sufficient verification capacity in preparation for future system reviews.

(2) Allocation criteria (1/2)

(1) Benchmarking and grandfathering

- We will review whether the industry-specific benchmarks set at this time are functioning as incentives for introducing decarbonization technologies. This review will consider the emission reduction status of covered entities after the system launch, the emission reduction targets and investment plans outlined in their transition plans, and the supply-demand situation of emission allowances. The allocation method for FY2031 and beyond will be revised as necessary.
- In conducting the review, we will also consider the development and implementation status of new decarbonization technologies supported through measures such as GX Economic Transition Bonds. The system will be designed to promote the widespread adoption of these new technologies.
- Sectors subject to grandfathering will be examined for transition to benchmark-based allocation from FY2026, ensuring appropriate recognition of past reduction efforts and allocations that reflect industry characteristics. Particular attention will be given to heat supplied to other entities and electricity sources such as self-transmission that are not covered by the power generation benchmark, with allocation methods designed to secure fairness between heat and power sources and to encourage investment in lower-emission heat and power options.
- Special measure that will be put in place for industries with large discrepancies between the top 50% and top 32.5% benchmark values will be discontinued from FY2031, as they are a form of transitional relief for companies with inferior emission intensity.

(2) Adjustment measures for new establishments, closures, and changes in activity levels

- Adjustment measures for new establishments, closures, and changes in baseline activity levels will be reviewed continuously to ensure they properly incentivize decarbonization investment, revising them as necessary.
- Specifically, we will assess whether changes in activity from the restructuring of businesses (e.g., facility consolidation) or market shifts cause allowance shortages/surpluses that hinder corporate growth or create disincentives for emission reductions. We will also explore more nuanced allocation adjustment methods that better reflect actual business activities while avoiding methods with overly-complex implementation.

(2) Allocation criteria (2/2)

(3) Consideration of past reduction efforts

- Grandfathering is a mechanism that tends to generate surplus allowances for entities where reduction measures have not progressed and where room for additional measures remains. Since transitioning to benchmarking is inherently desirable, and since it is inappropriate to continue evaluating past reduction efforts (dating back to FY2013, before the launch of the system) in a fixed manner over an extended period, this measure will be discontinued from FY2031, five years after the launch of the system.

(4) Mitigation of carbon leakage risks

- We will verify whether this measure effectively avoids carbon leakage for regulated entities and leads to decarbonization investment in Japan, based on capital investment plans outlined in the Transition Plan. We will review the measure, including its eligibility requirements and allocation levels, as necessary.

(5) Consideration of decarbonization-related R&D investment

- After the launch of the system, we will confirm the status of R&D investment by regulated entities through their Transition Plans. We will verify whether both immediate capital investment and future-oriented innovation investment are being appropriately encouraged through this aspect of the policy.
- The introduction of this measure is based on the need for innovation investment during the transition period, in which alternative technologies have not yet been fully established. The future design of the system will be examined considering the progress in the development and deployment of alternative technologies, supported, for example, through instruments such as GX Transition Bonds.

(3) Other matters (1/2)

- An ETS, premised on market-based pricing, may require design revisions during long-term operation to address divergences from the original economic and social circumstances.
- As Japan's ETS aims to simultaneously achieve emission reductions and industrial competitiveness, we will review the system as needed in an agile manner. This review will consider both emission reduction and development perspectives, taking into account social changes, corporate GX initiatives, foreign export protection measures, and other matters related to maintaining or enhancing Japan's international competitiveness.
- Accordingly, we will conduct continuous and regular reviews and risk assessments post-launch. In the event of unexpected impacts on domestic or export industries, we will consider system reviews beyond the preceding items and take appropriate measures based on the results.
- System reviews will also give due consideration to the matters resolved by the House of Representatives and the House of Councillors during the amendment of the GX Promotion Act.

[ref.] Supplementary Resolution (Extract) on the Bill to Partially Amend the Act on Promoting a Smooth Transition to a Decarbonized Growth-Oriented Economic Structure and the Act on the Promotion of Effective Utilization of Resources

In implementing this Act, the Government shall give due consideration to the following points:

(omitted)

10. Regarding the allocation of emission allowances for decarbonized growth-oriented investment operators, verify whether, as a whole, the allocation contributes to achieving the 1.5°C target under the Paris Agreement and the greenhouse gas reduction targets set forth in Japan's nationally determined contribution, and publish the results. Furthermore, based on the verification results, take necessary measures when deemed appropriate.

(omitted)

(3) Other matters (2/2)

- To link decarbonization investments to economic growth, it is necessary to develop an environment where products with high decarbonization performance, produced through the introduction of decarbonization technologies into manufacturing processes, are valued in the market.
- Therefore, we will review the GX League, which is a framework for trialing the ETS, and implement necessary measures outside the system, such as creating a mechanism to evaluate companies that are actively engaged in the procurement of GX products and services.

Direction of GX League Review

Excerpt from the Secretariat's explanatory materials for the 5th Study Group on Initiatives in the Supply Chain in the GX League, December 2, 2025

Current GX League

[GX League Activities]

- Focus on in-house emission reductions and implementation of voluntary emissions trading.
- In rule-making, progress has been made in evaluating in-house emission reductions (actual reduction amounts). Progress has also been made in evaluating reductions occurring downstream in the supply chain (avoided emissions).

[Participation Requirements]

- Setting reduction targets for FY2025 and FY2030, and reporting/disclosing progress.

Direction for the Next Phase of GX League

[Activities of the next GX League]

- Focus on rule-making to strengthen competitiveness through emission reductions across the supply chain, including the procurement and sales of GX products and services.
- Additionally, we will publicize and disseminate corporate efforts externally, such as by publishing rankings of companies' initiatives for GX demand creation.
- Furthermore, regarding support via the GX budget, incentives will be provided according to the degree of contribution to demand creation, etc.

[Participation Requirements]

- The following items shall be reported and disclosed:
 - ① Calculation of Scope 1 and Scope 2 emissions
 - ② Matters related to initiatives for GX demand creation, etc.