環境省
Ministry of the Environment

Japan's domestic and international activities to build the Refrigerant Circular Economy

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SUSTAINABLE DEVELOPMENT GOALS
Re-Style
デコ活 くらしの中のエコろがけ
つなげよう、支えよう 森里川海
Plastics Smart
脱炭素ポータル

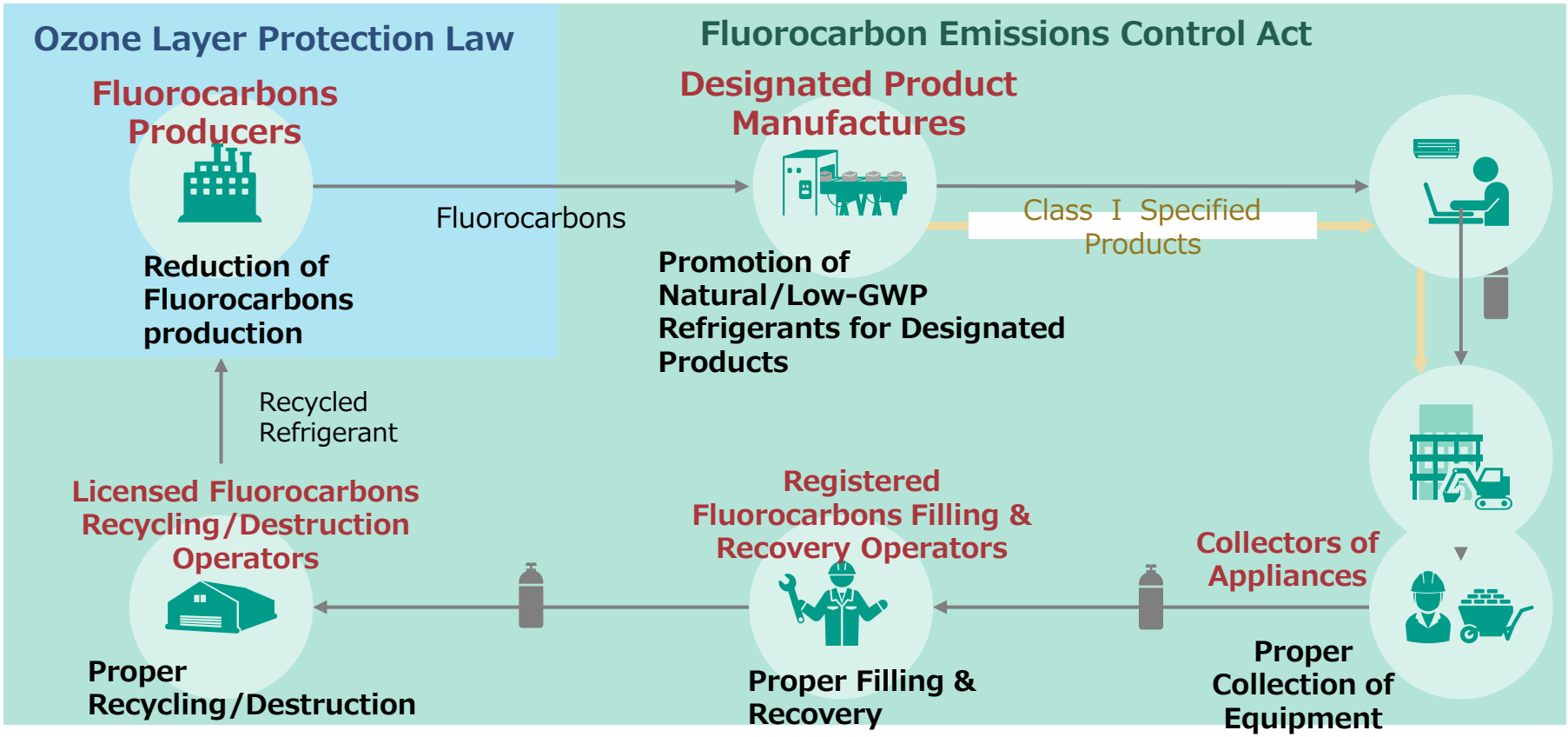
Today’s Agenda

- Overview of Japan's legal framework for reducing fluorocarbons
- Current status of fluorocarbons consumption and emissions in Japan
- Strengthening the Legal Framework to promote emissions reduction

Overview of Japan's legal framework for reducing fluorocarbons consumption and controlling emissions

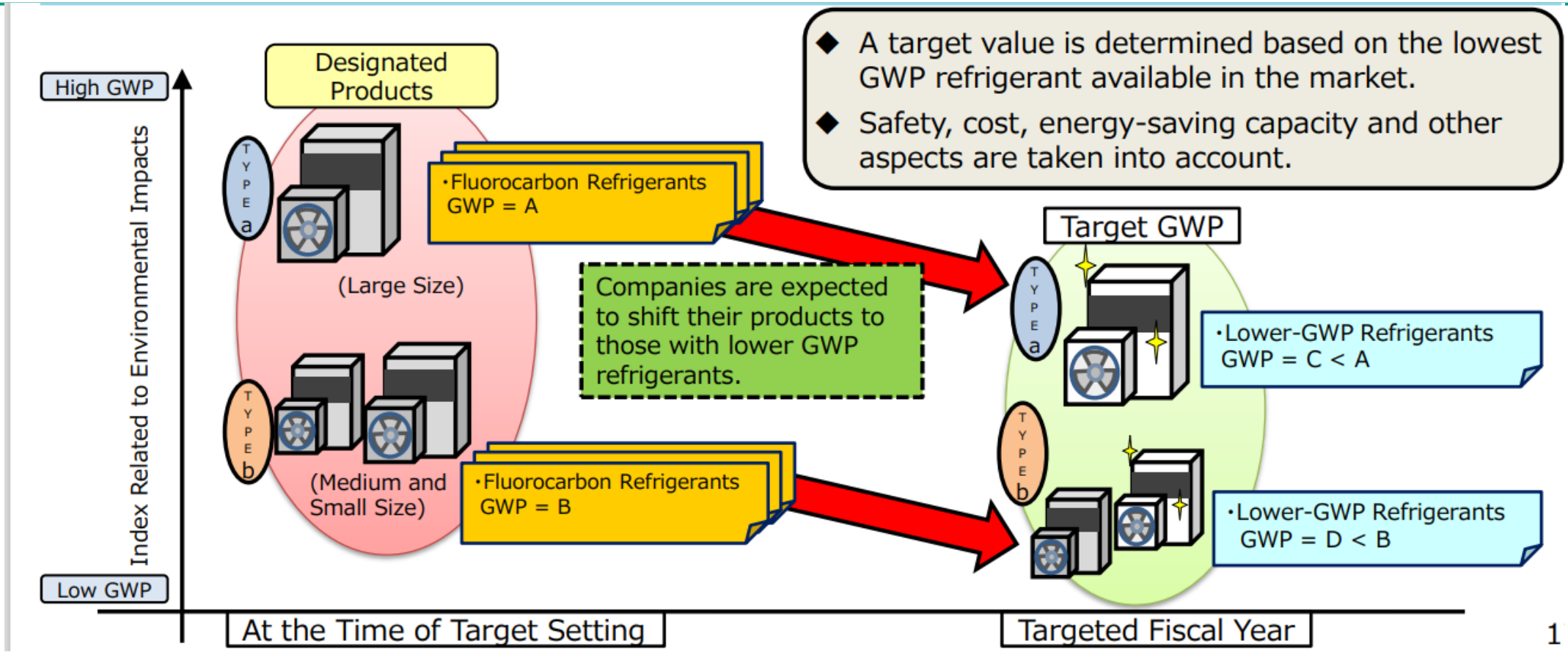
Overview of the Fluorocarbon Emissions Control Act

- **Ozone Layer Protection Law** : **Establishes controls on the production and import of fluorocarbons** to reduce the production and consumption of CFCs, HCFCs and HFCs in accordance with the Montreal Protocol. .
- **Fluorocarbon Emissions Control Act** : **Establishes lifecycle-based emission reduction measures**, including management of commercial refrigeration and air-conditioning equipment and refrigerant recovery at end-of-life.
- Downstream of Automobile ACs are covered by the End-of-Life Vehicle Recycling Act; Downstream of Residential ACs and refrigerators by the Home Appliance Recycling Act.



Promoting Low-GWP Top-runner Products

- Fluorocarbons Emissions Control Act designates product categories and based on the best available product, the target value is determined in that product category with the target year for achieving that target value.
- **Manufacturers and importers are required to meet the target GWP value for their products by the target year.**
- Compliance has been high: in FY2024, 91% of manufacturers and importers subject to the scheme achieved their applicable target GWP values.



Subsidies for Natural Refrigerant Refrigeration Equipment (Energy Special Account: ¥7.0 Billion)

- Natural refrigerant systems are generally more expensive than fluorocarbon-based systems because they require measures to address high-pressure operation and flammability.
- **MOEJ subsidizes the introduction of natural refrigerant systems that also contribute to energy efficiency** by operators of **cold storage warehouses**, **food processing plants**, and **food retail stores**.
- **Subsidy rate: one-third of eligible costs (one-half for certain SMEs).**
- The current program covers **FY2023-FY2027 (five fiscal years)**.

Indoor Unit

Outdoor Unit

Cold Storage Warehouses





Refrigeration Unit
(About JPY 140 million/Case)

Food Processing Line





Refrigeration Unit
(About JPY 90 million/Case)

Display Cases





Refrigeration Unit
(About JPY 30 million/Case)

Fluorocarbon filling, recovery, recycling and destruction -How it works? Who covers the costs?-

- **Refrigerant recovery at end of life is legally required** in Japan, and the intentional release of fluorocarbons into the atmosphere is prohibited. **Equipment owners bear the costs of refrigerant recovery, while a certificate-based system ensures traceability** throughout the refrigerant management.

Business owners

Certificate ↑ ↓ Fees

Maintenance operator

Certificate ↑ ↓ Fees

Fluorocarbon filling & recovery operator

Certificate ↑ ↓ Fees

Certificate ↑ ↓ Fees

Fluorocarbon recycling operator

Fluorocarbon destruction operator

Recovery operators:
approx.**52,000**



Recycling facilities:
35


Distillation and purification



Destruction facilities:
56

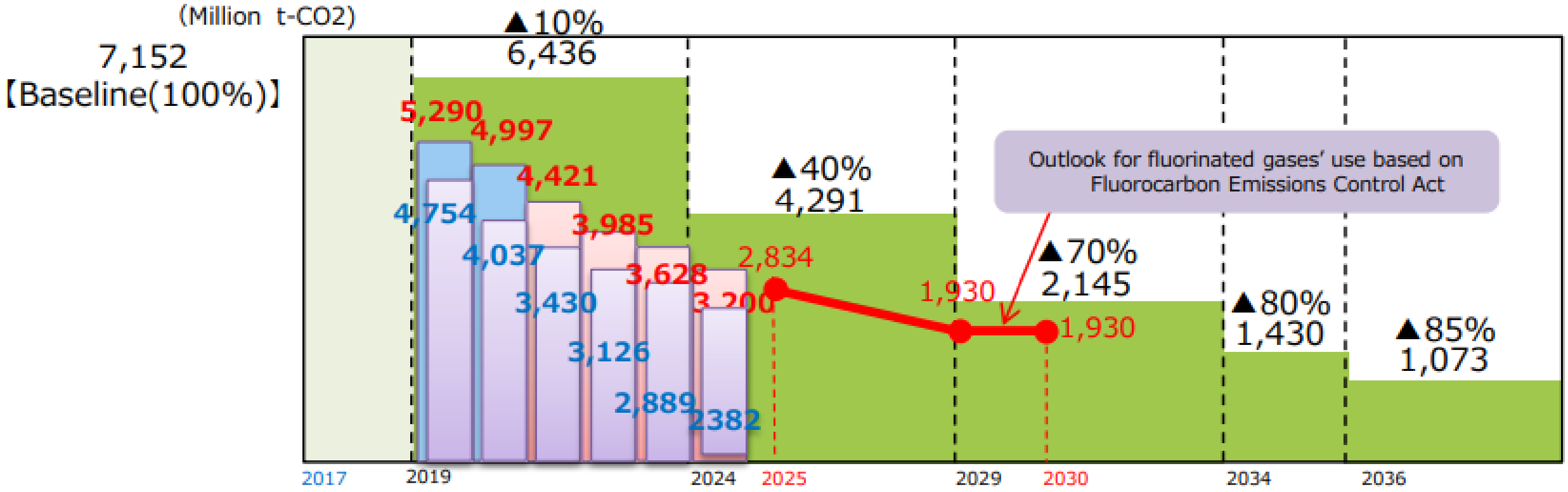

Co-combustion of waste


Superheated steam

Current status of fluorocarbons consumption and emissions in Japan

HFC phase-down and Consumption volume in Japan

- 2024 quota on consumption was allocated to 32.00 million tones of CO2 equivalent for basic and special uses. This value is far below the target consumption by 25%.
- The actual consumption is also under the quota in 2024 .



※ Baseline is calculated based on the average of actual value 2011-2013

HFCs Emissions Trends in Japan

- The amount of HFC emissions had been increasing since 2005 but turned downward in 2022. **In 2024, the emissions decreased for the three consecutive years.**
- Further efforts are required **to achieve the 2030 and 2040 reduction targets** set out in the Plan for Global Warming Countermeasures (approved by Cabinet in February 2025).

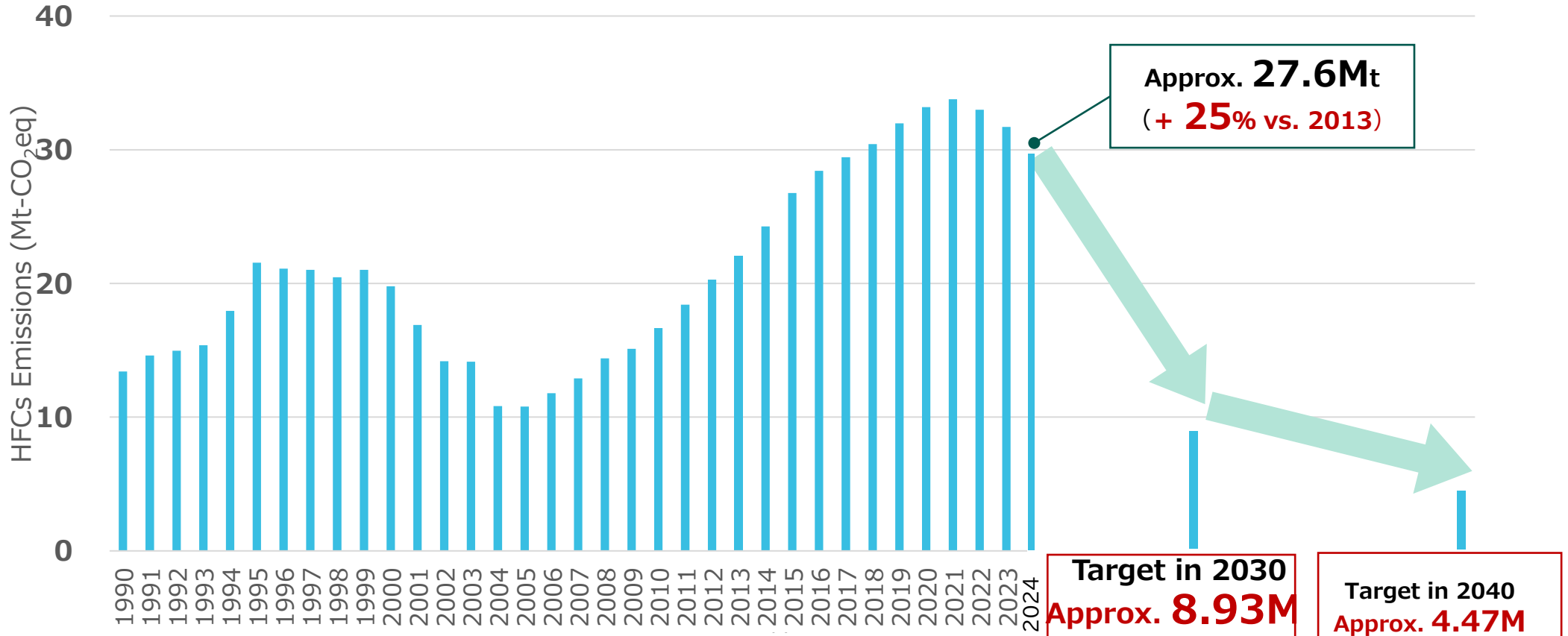
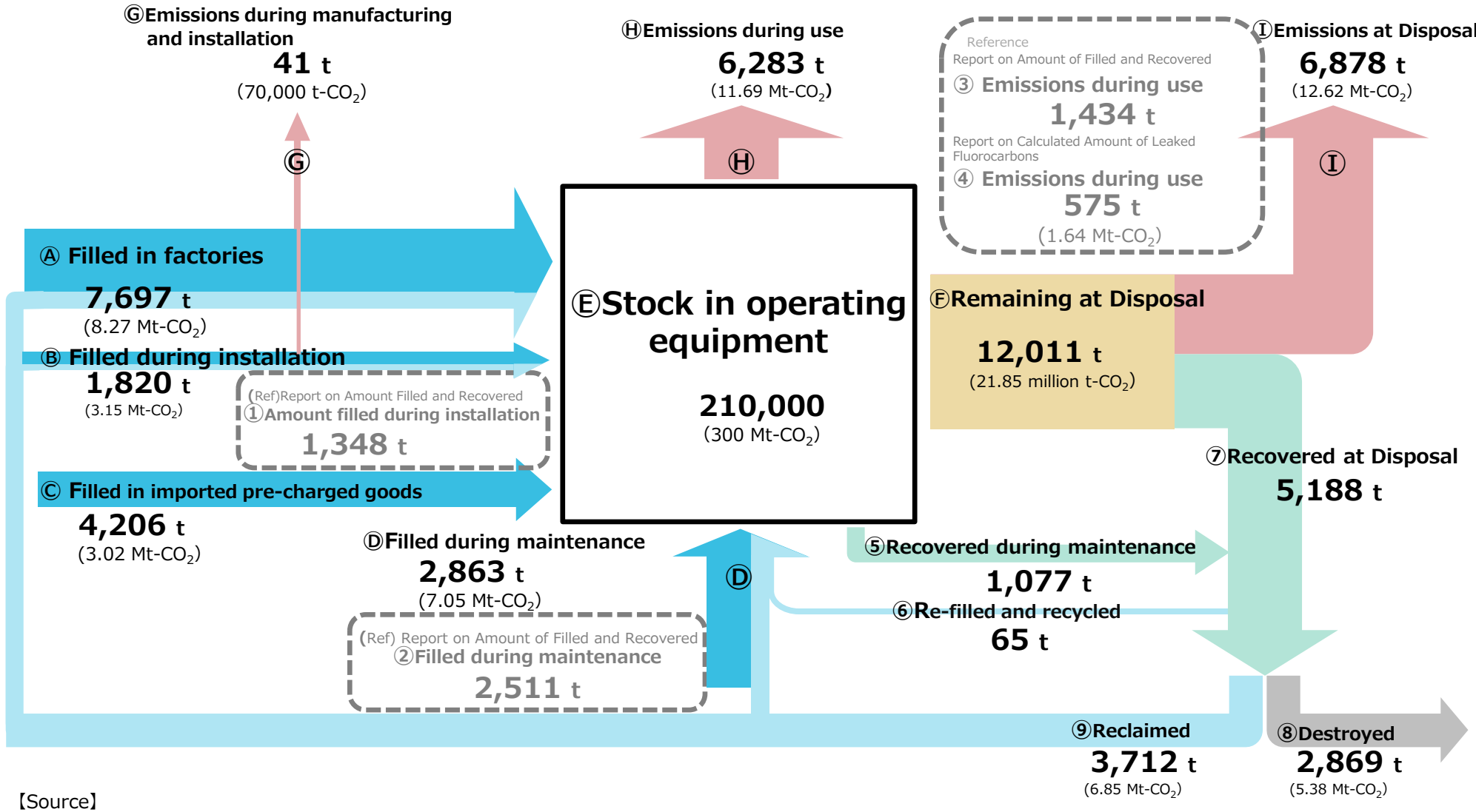


Figure: Trend of HFC Emission Amounts
(Source: prepared by MOEJ based on GHG inventory)

Material Flow of HFC Refrigerants (2024)

※ This estimate is based on current available data. It will be further examined.

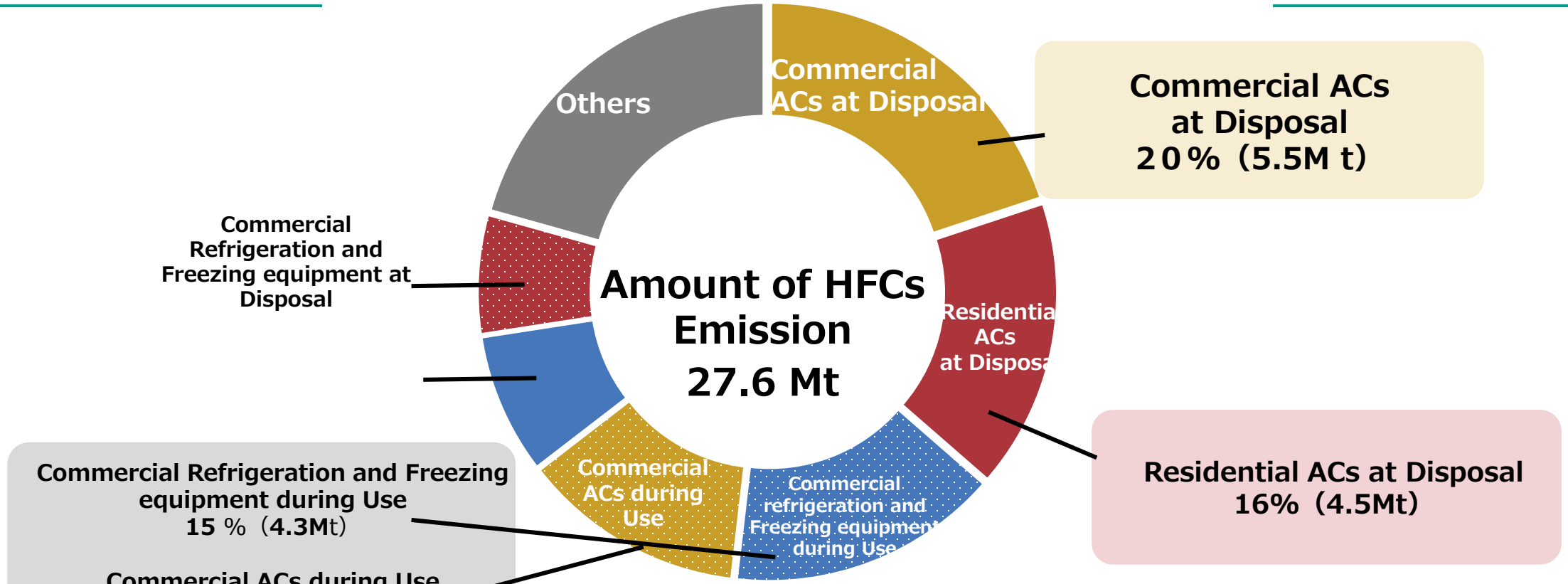


【Source】
①②③④⑤⑥ :Reported amount under the Fluorocarbon Emissions Control Act (Fiscal Year)
⑦⑧⑨ : Reported amount under the Act + amount on other equipment using HFCs (domestic air conditioners, etc.) (Fiscal Year)
ⒶⒷⒸⒹⒺⒻⒼⒽⒾ : Estimation used for GHG inventory, etc. (Calendar Year)

Strengthening the Legal Framework to promote emissions reduction

Detailed breakdown of HFCs emission in Japan (2024)

- Unrecovered refrigerants from **commercial and residential AC at disposal are the largest** emission sources, accounting for about 40% of total HFC emissions.
- The third-largest source is **leakage from commercial refrigeration and freezing equipment during use**.



Breakdown of HFCs Emissions (by life cycle stage and equipment type) (2024)

Source) Prepared by MoEJ based on GHG inventory calculation data

Collection Rates for Home Appliances

- Among the four categories covered by the **Home Appliance Recycling Act**, televisions, refrigerators/freezers, and washing machines/dryers achieve collection rates of around 90%, while the **collection rate for air conditioners remains at approximately 40%.**
- One factor contributing to the relatively low collection rate of air conditioners is their high resource value, as they contain significant amounts of valuable metals such as copper.

$$\text{Collection Rate} = \frac{\text{Number of Units Properly Collected and Recycled}}{\text{Number of Units Shipped}}$$

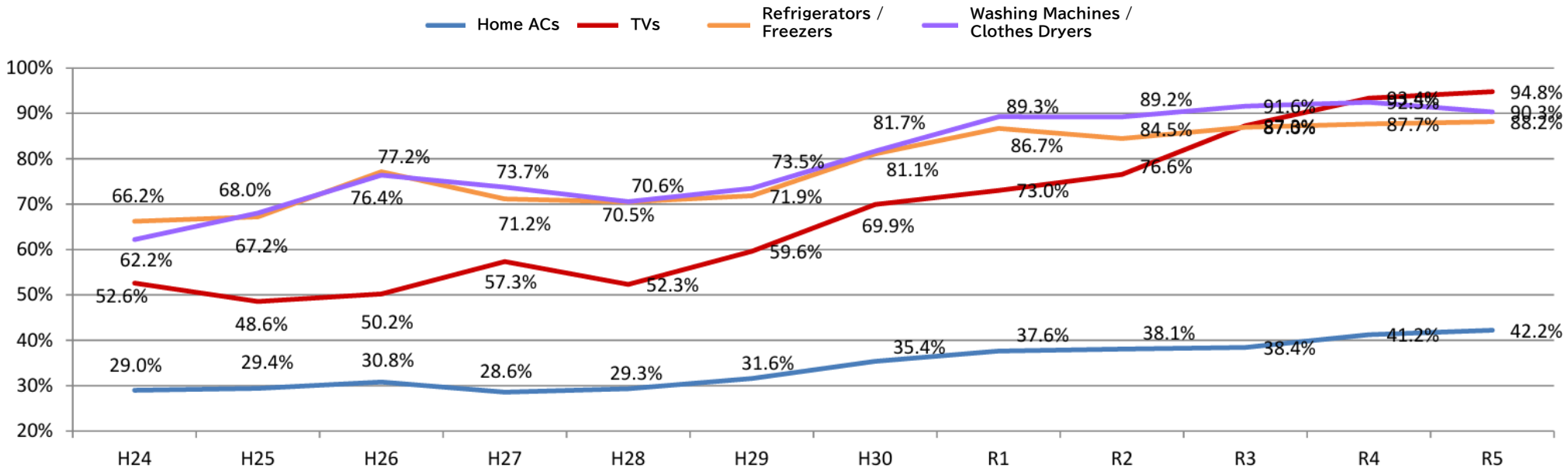
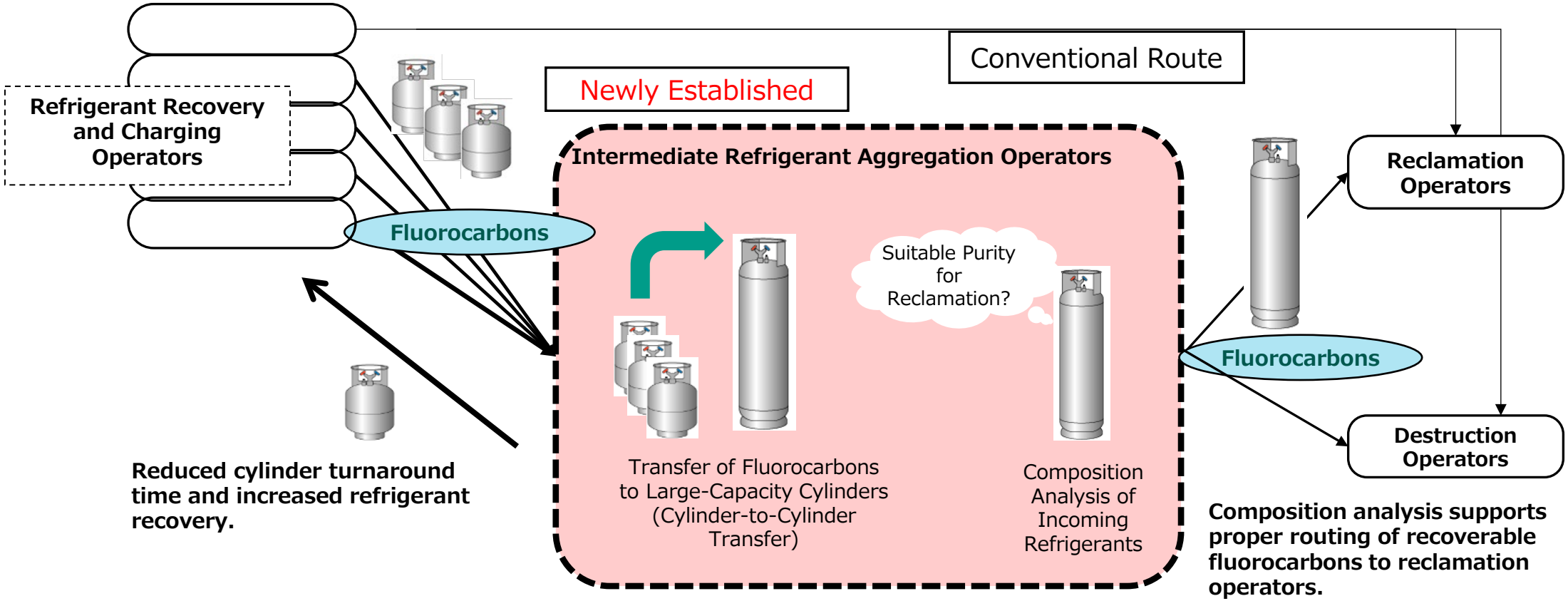


Figure. Collection Rate

Source: Status of Recycling under the Home Appliance Recycling Act in FY2023 (2025/4/25 METI MOE)

Registration System for Intermediate Refrigerant Aggregation Operators

- **Intermediate aggregation of recovered fluorocarbons is essential for improving cylinder utilization efficiency and expanding the use of reclaimed refrigerants.**
- A registration system will be established for aggregation operators, requiring compliance with uniform national standards, issuance of treatment certificates, and periodic reporting under government supervision.



Thank you for your attention!