



経済産業省

Ministry of Economy, Trade and Industry

Current Situation and Challenges of Fluorinated Gases control in Japan

Implementation of the
Act on Rational Use and Proper Management of Fluorocarbons
and related matters

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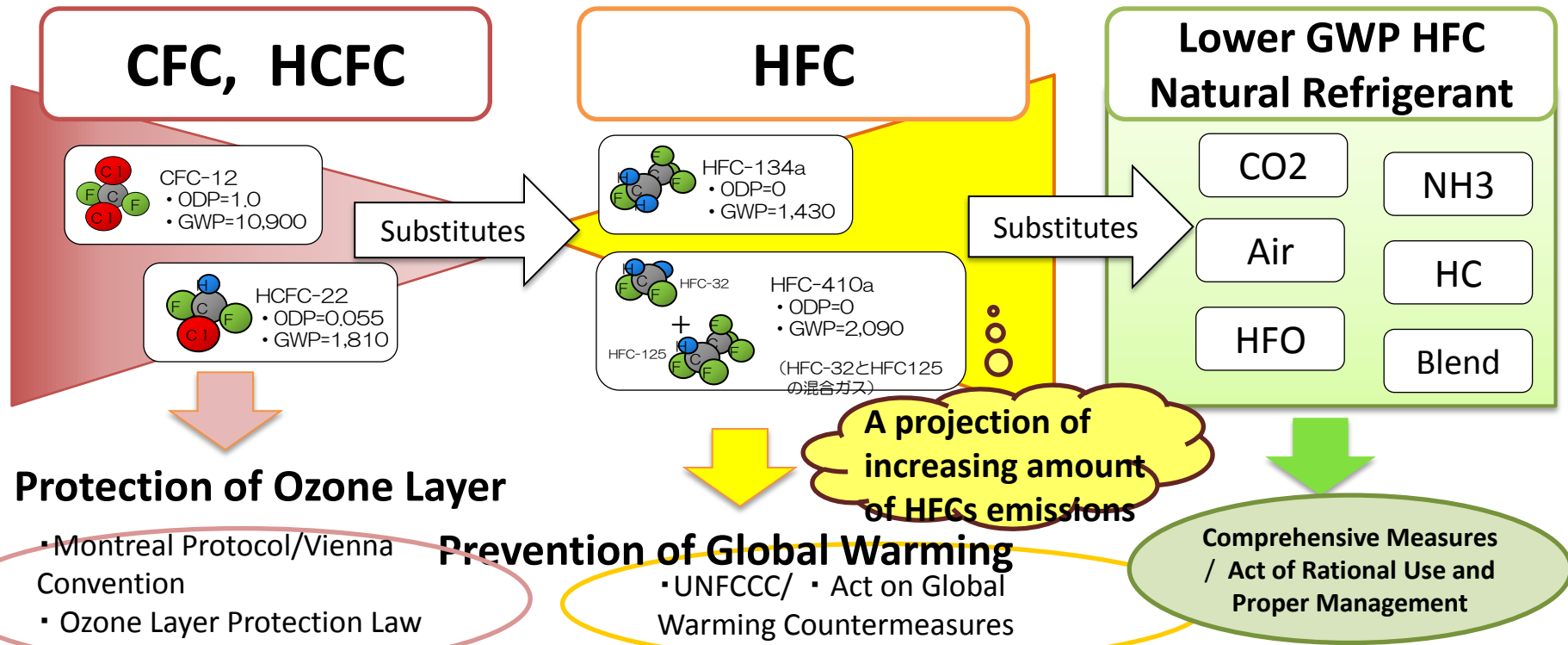
I -1. Control system of fluorocarbons

- Ozone layer depletion :

Production and consumption of Ozone Depletion Substances (ODSs) such as CFCs and HCFCs are controlled by Act on the protection of the Ozone Layer through the Control of specified substances and other measures according to the Montreal Protocol.

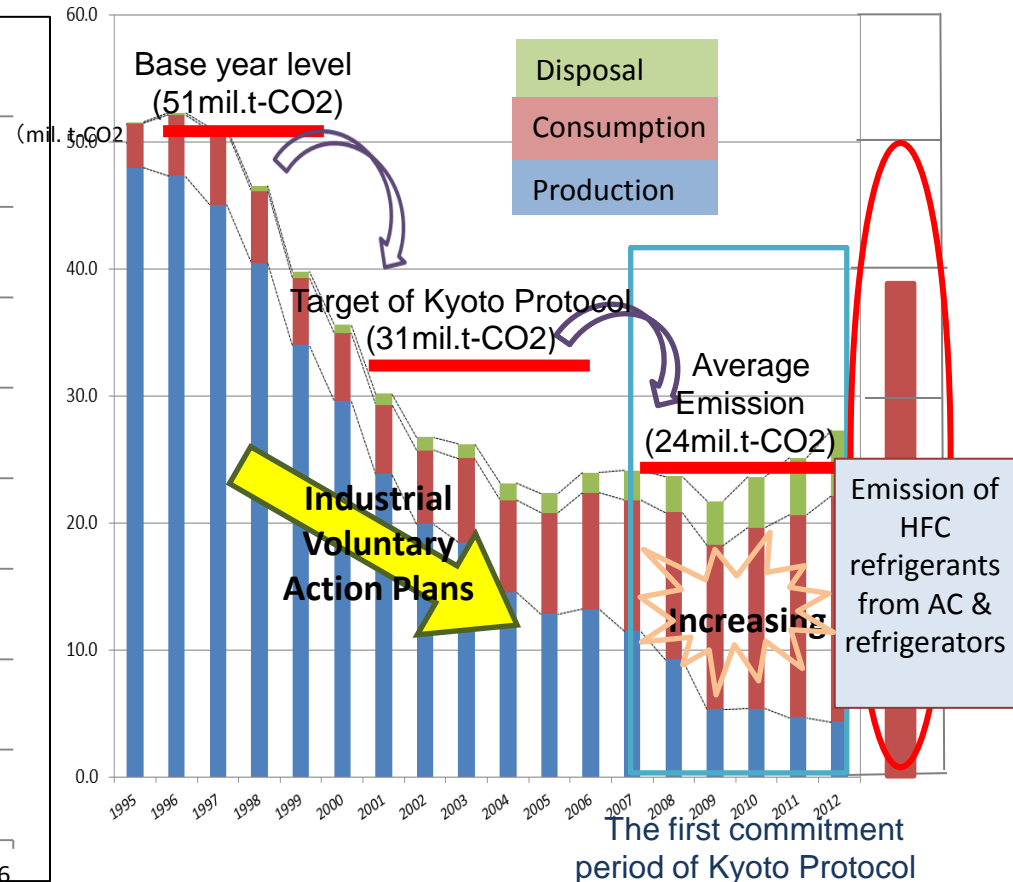
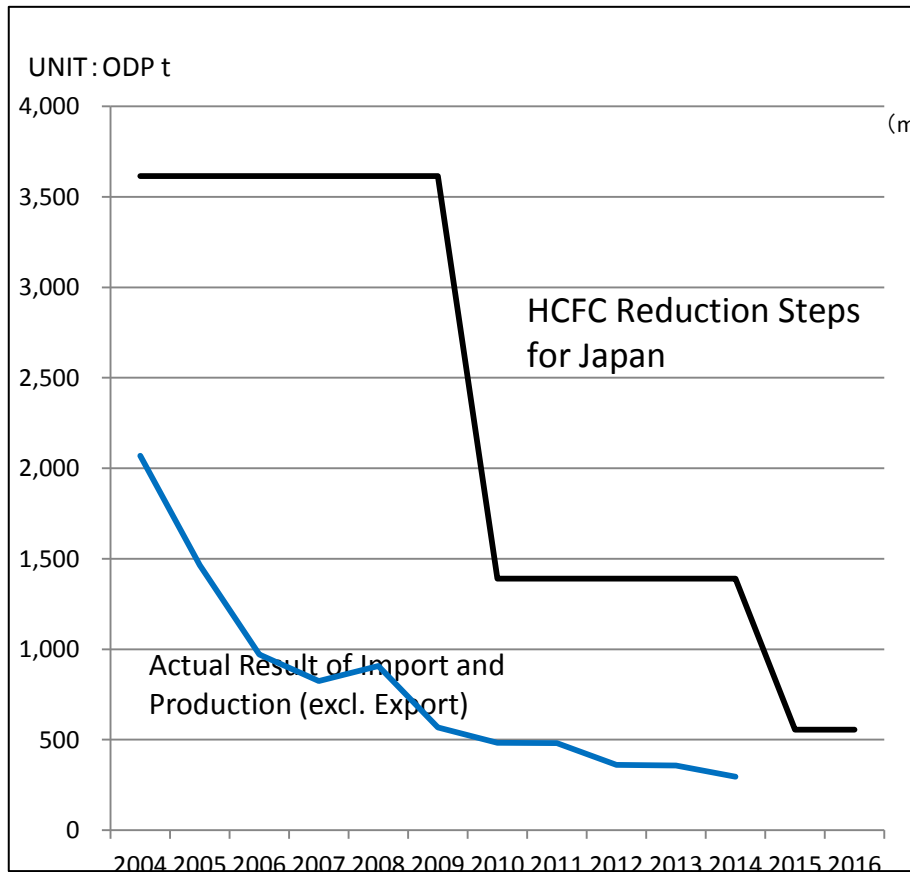
- Global Warming :

Emission control of HFCs, which have no Ozone Depletion Potential, is covered by Act on Global Warming Countermeasures with other GHGs under the target of UNFCCC. Reflecting a projection of increasing HFCs emissions, comprehensive measures have been introduced under the revised law, Act on Rational Use and Proper Management of Fluorocarbons.



I - 2. Situation of Fluorocarbons and Fluorinated gases

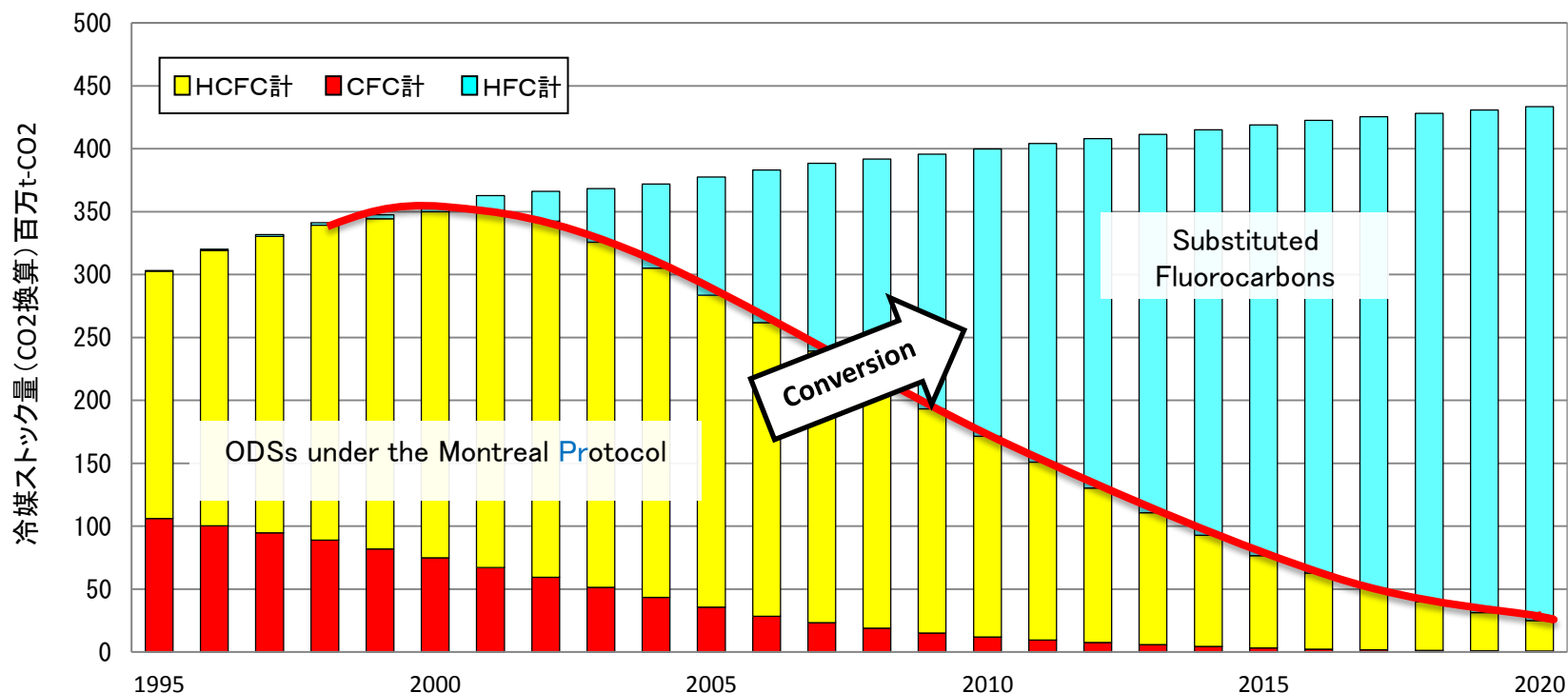
- Consumption of all ODSs under the Montreal Protocol has been/will be phased-out by production/export/import licenses.
- Emission of fluorinated gases under the UNFCCC had been steadily reducing by industrial voluntary action plans. However, total emissions have in recent years begun to increase, due to the conversion from CFC and HCFC to HFC as a substitute refrigerant.



I - 3. Cause of increasing HFC emission

Due to the conversion from CFC and HCFC to HFC as a substitute refrigerant, aggregate stocks in refrigerators and air conditioners have increased and will continue to increase year by year.

Estimated GWP stock of refrigerators and air conditioners (BAU)



BAU: Business As Usual ※フロン分野の排出推計においては、現状の対策を継続した場合の推計を示す。

出典: 実績は政府発表値。2020年予測は、冷凍空調機器出荷台数(日本冷凍空調工業会)、使用時漏えい係数、廃棄係数、回収実績等から経済産業省試算。

I - 4. Current emission of fluorinated gases and voluntary action plans

The emission of fluorinated gases in 2014 increased by 8% from 2013 to 40.7 mil. CO₂ tons, mainly from rising HFCs stocks in refrigerators and air conditioners.

Converting those substances that have high GWP into lower GWP or non fluorocarbons for refrigerant or other purposes is urgently needed.

Contents of voluntary action plans

- Countermeasures for reducing leakage during production and in use.
 - eg. Enhancement of combustion/decomposition facilities, vibration proof cooling system, conversion of current gases that have high GWP to lower GWP ones or non fluorocarbons, feasibility assessment of non/slightly flammable refrigerants, conversion to low GWP solvents

Sectors	Emission in 2013 (Mil t-CO ₂)	Changes	Emission in 2014 (Mil t-CO ₂)	Shares in all GHGs
Fluorinated Gases	37.56	+8%	40.74	3. 0
HFC	31.68	+12%	35.34	2. 6
PFC	3.27	+3%	3.35	0. 2
SF6	1.25	▲3%	1.21	0. 1
NF3	1.36	▲39%	0.83	0. 1
All GHGs	1 4 0 8	▲3%	1 3 6 5	1 0 0

I - 5. Nationally Determined Contribution (NDCs) for the UNFCCC

- ❑ Japan submitted the Nationally Determined Contribution (NDCs) to the secretariat of UNFCCC before the Paris Agreement .
- ✓ All gases by 2030: 26.0 % reduction from 2013 (25.4% reduction from 2005)
- ✓ Fluorinated gases by 2030: 25.1% reduction from 2013 (4.5% increase from 2005)
- ❑ After the Paris Agreement, Japan has already published a global warming countermeasures plan (13.05.2016), and launched its new activities.
- ✓ Mid-term target: The same target as in the NDCs was confirmed.
- ✓ Long-term target: 80% reduction by 2050 by implementing global warming countermeasures with sustaining economic growth.

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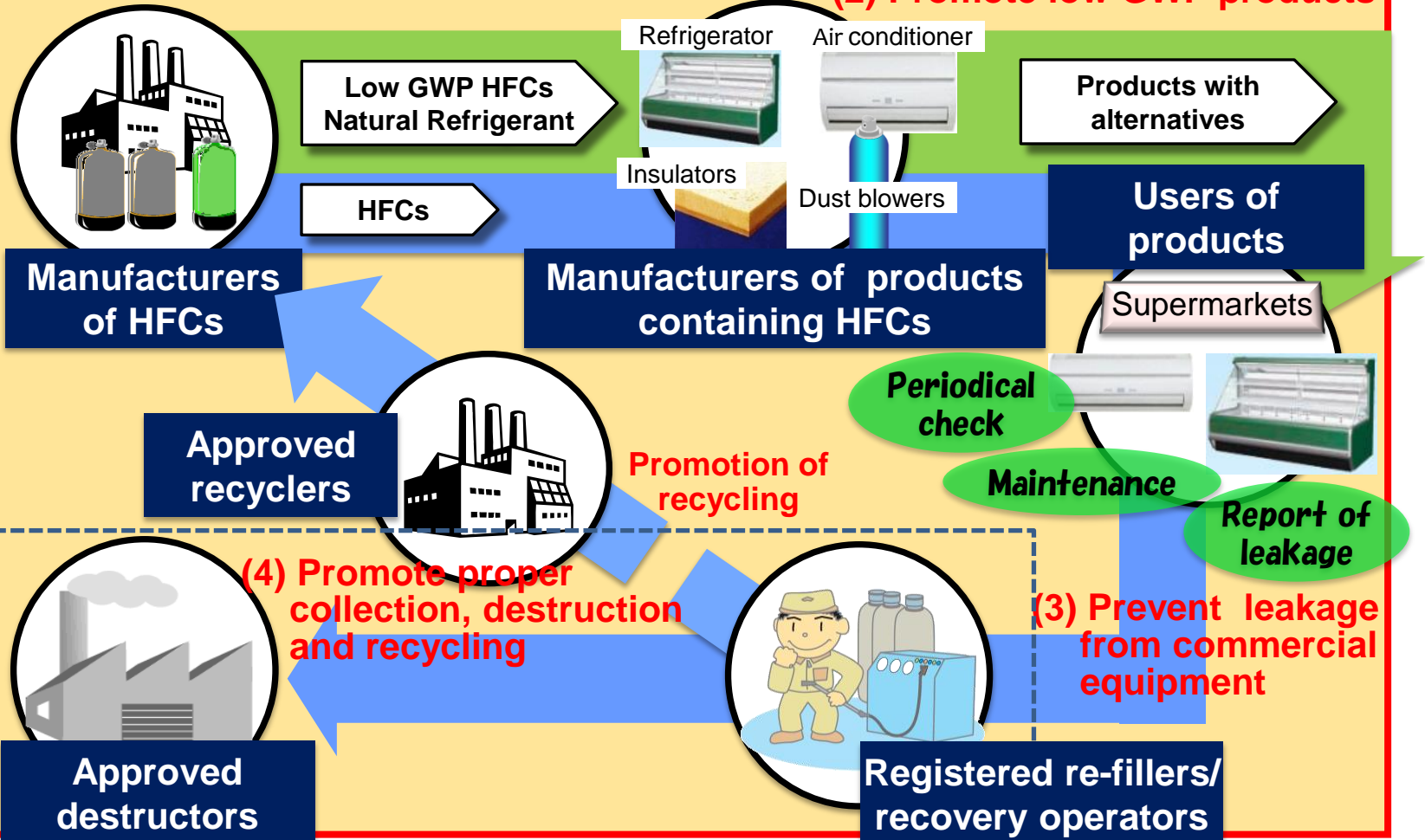
II -1. Overview of revised Act covering entire life cycle

The Act has been implemented since April 2015, requests all stakeholders to make efforts to reduce emissions of HFC

Target 43.4 mil-tCO₂ (2020), 36.5 mil-tCO₂ (2025)

(1) Phase-down HFCs

(2) Promote low GWP products



II -2. For Producers and Importers

Effort to reduce GWP of products

- ① Convert to low GWP fluorocarbons or non-fluorocarbons of their products
- ② Necessary technical development and facility investment. Enhancement of recycling and destruction

Sequence of program:

Government publishes outlook of consumption of fluorocarbons in 2020 and 2025 (in March 2015).

Producers and importers establish their rationalizing plans reflecting the outlook, and reports them to the government.

Government follows up with producers/importers regarding implementation of their plan.

<2020 Outlook>

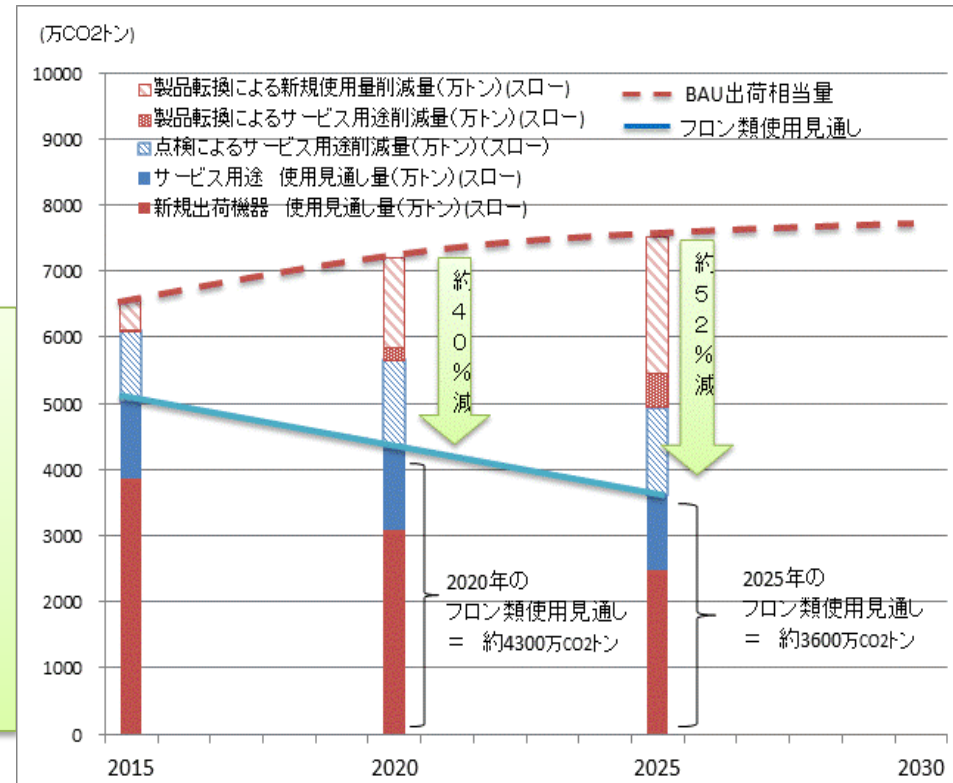
43.4 mil CO₂t (Reduction of 40% from BAU)

<2025 Outlook>

36.5 mil CO₂t (Reduction of 50% from BAU)








Contents of rationalizing plans

- Target of production/imports in 2020
- ✓ Projected production is below 43.2 mil
- Technical development plan, Facility investigation plan, Recycling and destruction plan
- ✓ All producers include their technical improvement plans for reducing their total GWP production



II -3. For Manufacturers of Products using Fluorocarbons

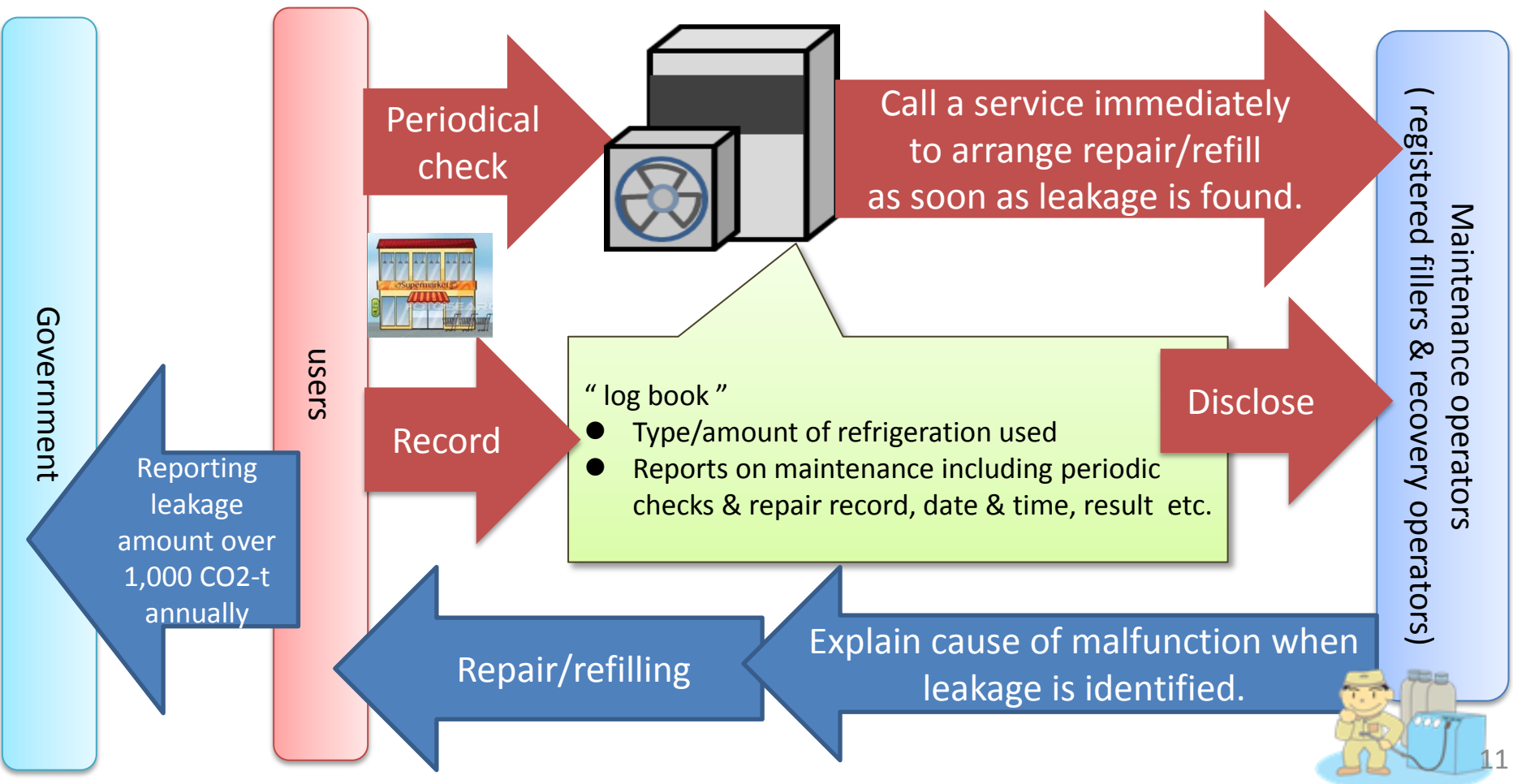
Manufacturers and Importers of designated products are required to replace high-GWP products with low-GWP or non-fluorocarbons for shipping, considering safety, energy efficiency, economic affordability etc.

Designated products ※	Current refrigerant (GWP)	Target value (GWP)	Target year
Room air conditioning 	R410A(2090) R32(675)	750	2018
Commercial air conditioning (for offices and stores) 	R410A(2090)	750	2020
Condensing unit and refrigerating unit (for separate type showcases, etc.) 	R404A(3920) R410A(2090) R407C(1774) CO2(1)	1500	2025
Cold storage warehouses (for more than 50,000 m ³) 	R404A(3920) Ammonia (single digit)	100	2019
Mobile air conditioning 	R134a(1430)	150	2023
Urethane foam (house construction materials) 	HFC-245fa(1030) HFC-365mfc(795)	100	2020
Dust blowers 	HFC-134a(1430) HFC-152a(124) CO2(1), DME(1)	10	2019

※ With some exceptions.

II -4. For business users of products using fluorocarbons

To prevent leakage, users are required to conduct periodic checks and to arrange for immediate repairs in case of leakage, and are prohibited from refilling without making repairs. Users are requested to maintain records and report cases of substantial leakage.



II -5. For collectors and recyclers of fluorocarbons

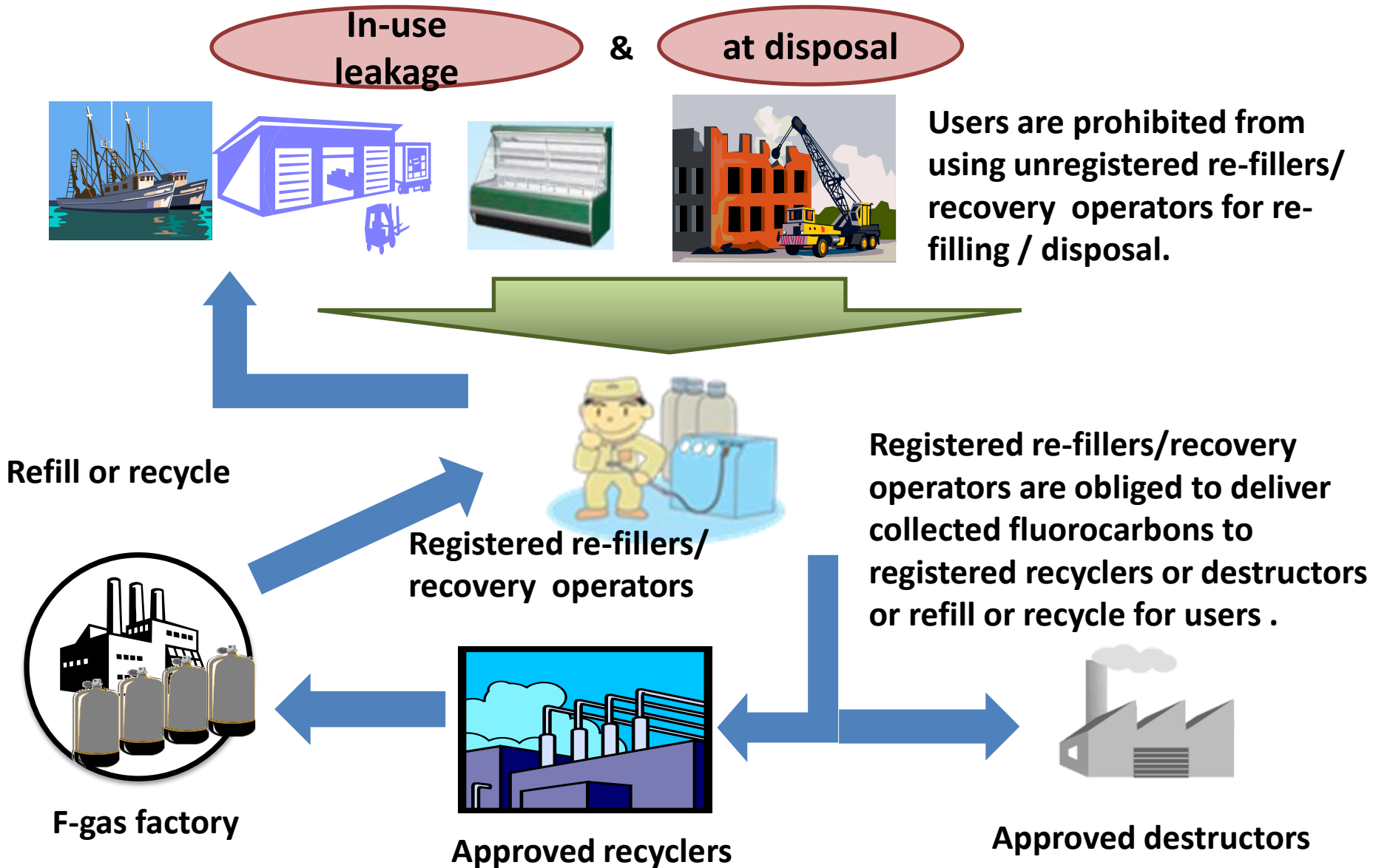


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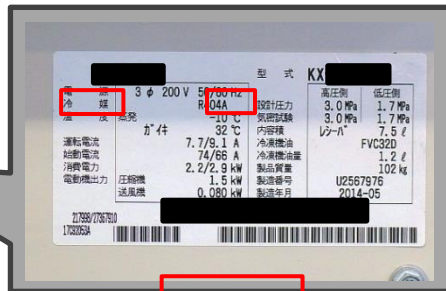
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III-1. Labeling (compulsory and voluntary system)

	Compulsory (requested by the Act)	Voluntary (Labeling JIS)
Purpose	To promote designated products using lower-GWP/ non-fluorocarbons such as natural refrigerants	To help users easily understand the environmental impact of products
Indication	<ul style="list-style-type: none"> ① Target year and target GWP value ② Name of products used (kind of fluorocarbon, or non-fluorocarbons), volume, and GWP value ③ Name and address of producers 	<ul style="list-style-type: none"> ① Target year and GWP value used ② Grade (such as S or AAA) showing achievement of target
Location	On the products themselves and catalogs (items and places are registered in laws)	On the products themselves (including related products) and catalogs

Regulated indication on the designated products

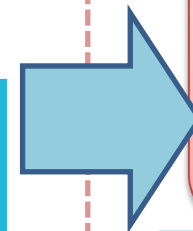


GWP



PROMOTION

Labeling JIS In the catalogs, etc.



SELECT by users

Lower- GWP

Natural refrigerant



Showcases are not currently categorized as designated products, but labels can be affixed to showcases.

III-2. Promotion of public awareness

① Information meeting for industries and business users

Meetings organized by the government are planned 59 times (direct 30, indirect 29) in 2015 FY and were organized 50 times in 2014 FY.

In addition, many voluntary meetings organized by industries, municipalities and other groups were conducted.

	Target	Contents	Operated /planned	Participants	2014 FY	
					Operated	Participants
Direct organized meeting	Collector	Overview of law, flow of FHC, role and activities of collectors, electronic data processing, etc.	30/30	1,140	50	6,633
	User	Overview of law, flow of FHC, role and activities of users, calculation of leakage electronic data processing, etc.		3,450		7,838
	General	Methods of maintenance of products etc.	-	-		5,222
Meeting supported by the Government	Depends on meeting organizers	Overview of law, flow of FHC, role and activities of collectors, role and activities of users, etc.	29/30	2,484	-	-
total				7,074		19,693

As of March 7 2016

② Publication

- a) public newspaper announcements (4 times in general newspapers and 3 times in industry papers)
- b) leaflet (general information - 160,000 copies, for business users reporting leakage - 40,000 copies)

III-3. Training course for empowering engineers

For preventing leakage of refrigerants during maintenance and construction, a re-education program for experienced engineers has been conducted by the government. The curriculum of the program is focused on practical exercises of advanced technologies including natural refrigerants such as CO2.

✓ Target number of trainees; 400 participants

Materials

- ① Guideline for planning and construction engineer
- ② Demonstration DVD video

Activities

- ① 40 places nation wide
- ② Ten trainees per one workshop

Curriculum

	subject	activities
First day	Lectures	<ul style="list-style-type: none">▪ Technical and legal information▪ Basic knowledge for safety
	Practices	<ul style="list-style-type: none">▪ Practices using DVD video▪ Practices on brazing
Second day	Practices	<ul style="list-style-type: none">▪ Practices on brazing
	Evaluation	<ul style="list-style-type: none">▪ Practices on brazing▪ Evaluation for practices▪ Discussion▪ Evaluation

➤ Voluntary training courses reflecting the national training course have been held nation wide.

Definitions and abbreviations

Words or phrases in this presentation are defined as follows without any specifications:

- CFCs; Chlorofluorocarbons
 - HCFCs; Hydrochlorofluorocarbons
 - HFCs; Hydrofluorocarbons
 - Fluorocarbons; CFCs and HCFCs controlled by the Montreal Protocol and HFCs controlled by the Kyoto Protocol/UNFCCC
 - ODSs; Ozone Depleting Substances controlled by the Montreal Protocol (CFCs, HCFCs, Halon, CTC, 1,1,1-Trichloroethane, Methyl Bromide, HBFCs* and Bromochloromethane*)
 - Fluorinated gases; Fluorocarbons defined above and PFCs, SF6 and NF3 controlled by the Kyoto Protocol /UNFCCC
- * HBFCs* and Bromochloromethane* are not used in Japan.



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Thank you for your attention.