

Future development related to the Montreal Protocol

February 2017
Fluoride Gases Management Office
METI, Japan

1 . Reduction status of fluorocarbons

2 . Operation to the Kigali amendment to the Montreal Protocol

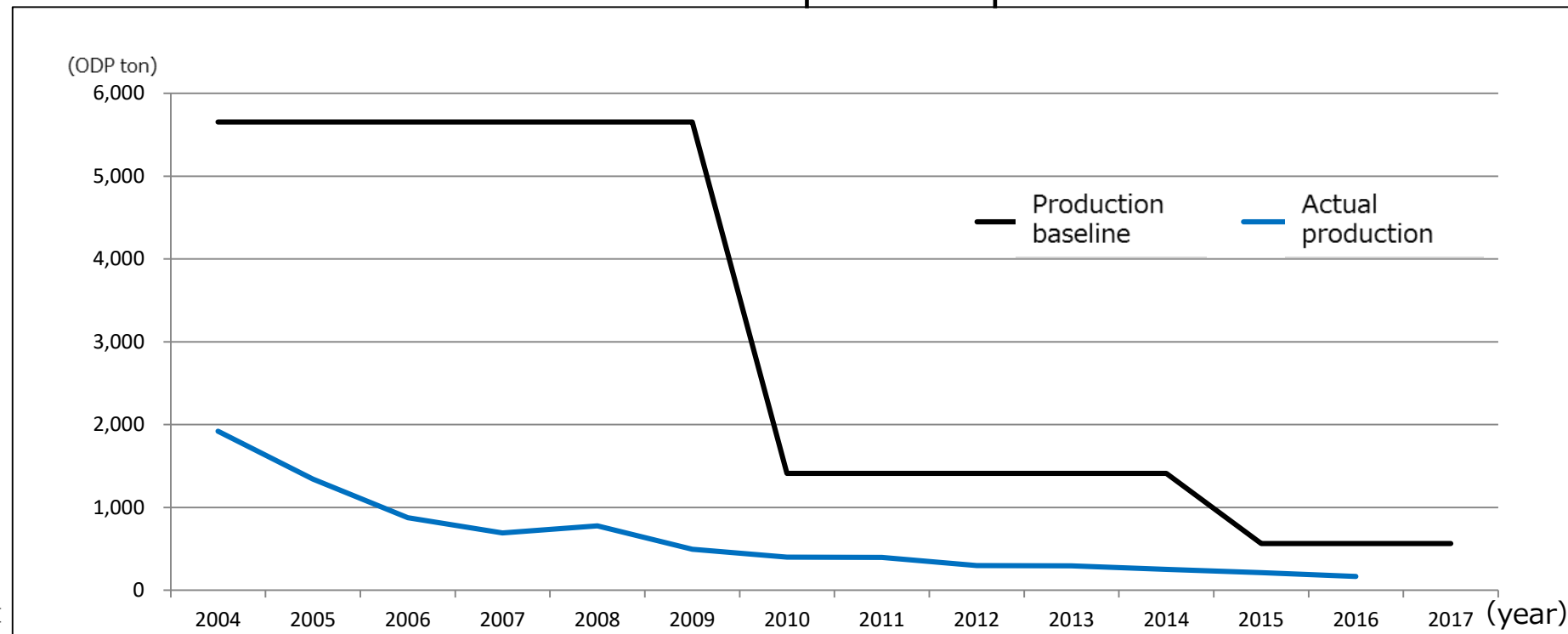
3 . R&D Promotion

4 . Efforts on emission reduction under the Act on Rational Use and Proper Management of Fluorocarbons

1 – 1. Control of fluorocarbons

- Measures for production, consumption and import of CFCs and HCFCs have been taken for protecting Ozone layer and proper implementation of the Montreal Protocol by the Ozone Layer Protection law since 1988.
- Production and consumption of ODSs other than HCFCs have been phased-out by 2005. HCFCs such as R22 will be phased-out by 2020.
- However, the Montreal Protocol does not require prohibition use of those equipment using HCFCs, and they will be used even after 2020.

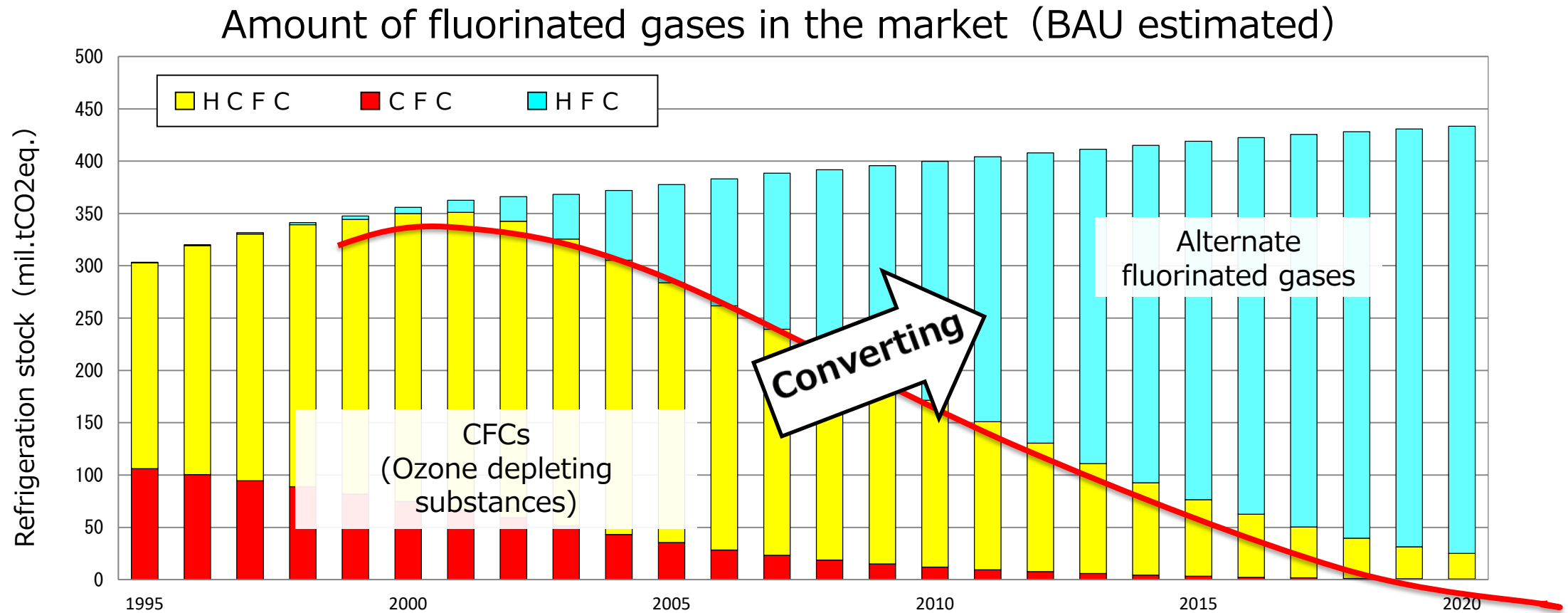
HCFC reduction steps for Japan



Source: METI

1 – 2. Stock increase of HFCs

- Stocked fluorinated gases have been increased in the market as CFCs converted to the alternatives since 2000 and which is a main cause of emission increase of HFCs.
- Immediate action on reduction of the stocked fluorinated gases in the market will be needed by converting to low-GWP and/or non-HFCs.



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2 – 1. Phase down schedule in Kigali Amendment

The amendment proposals to add HFCs, that have global warming potentials, to the list of control substances on production and consumption under the Montreal Protocol for phasing down had been discussed between parties continuously since 2009 and resulted in adoption of the amendment at the 28th meeting of the parties in Kigali, Rwanda in October 2016.

	Developed Countries ^{※1}	Developing Countries Group 1 ^{※2}	Developing Countries Group 2 ^{※3}
Base year	2011-2013	2020-2022	2024-2026
Formula (HFC + HCFC)	Average HFC consumption + HCFC baseline 15%	Average HFC consumption + HCFC baseline 65%	Average HFC consumption + HCFC baseline 65%
Freeze year	NA	2024	2028 ^{※4}
Reduction Steps ^{※5}	2019 : ▲10% 2024 : ▲40% 2029 : ▲70% 2034 : ▲80% 2036 : ▲85%	2029 : ▲10% 2035 : ▲30% 2040 : ▲50% 2045 : ▲80%	2032 : ▲10% 2037 : ▲20% 2042 : ▲30% 2047 : ▲8 z へ5%

※ 1 : For Belarus, Russian Federation, Kazakhstan, Tajikistan, Uzbekistan, 25% HCFC component of baseline and different initial two steps (1) 5% reduction in 2020 and (2) 35% reduction in 2025.

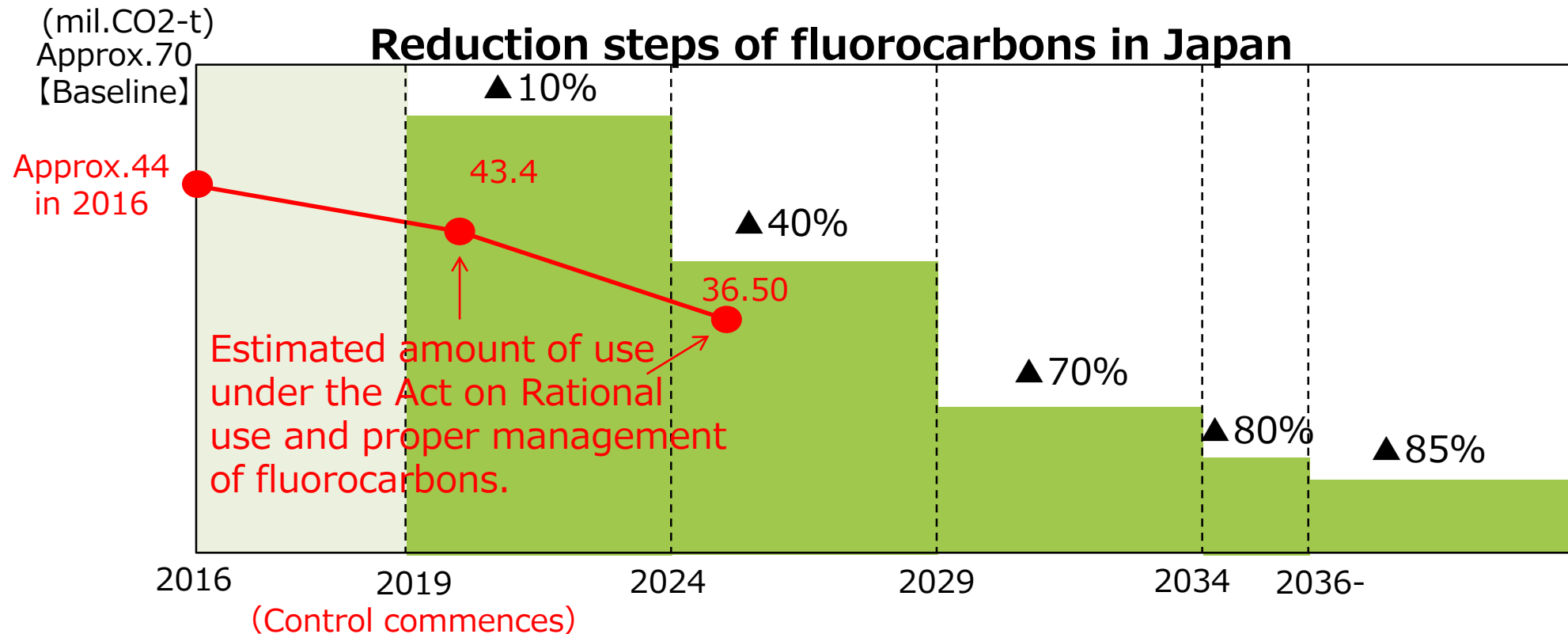
※ 2 : Group 1 : Article 5 parties not part of Group 2 ※ 3 : Group 2 : GCC, India, Iran, Iraq and Pakistan

※ 4 : Technology review 4-5 years before 2028 to consider the compliance deferral of 2 years from the freeze of 2028 of Article 5 Group 2 to address growth in relevant sectors above certain threshold.

※ 5 : Technology review in 2022 and every 5 years

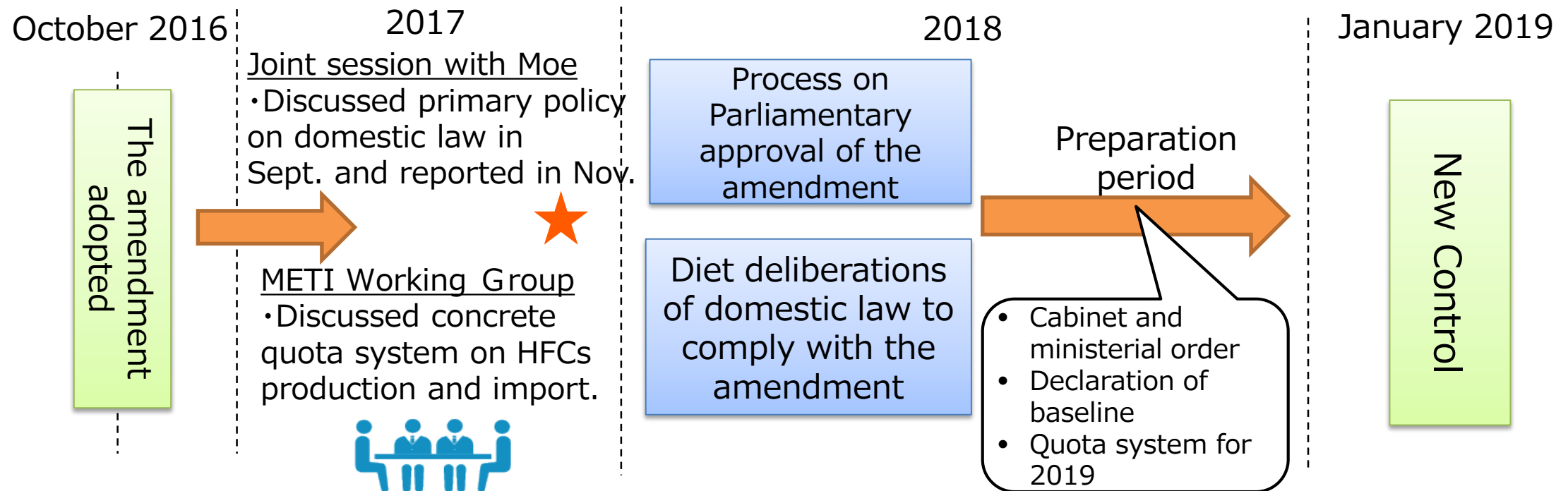
2 – 2. Reduction obligation under the amendment

- The amendment to the Montreal Protocol imposes mainly reduction on its calculated level of production and consumption (production + import – export) HFCs under certain amount.
- For the developed countries including Japan, reduction from the baseline (average 2011-2013) will commence in 2019 and phase down to more than 70% after 2029 and beyond.
- Japan will be in compliance with the reduction steps by 2025 according to the estimated amount of use indicated below.



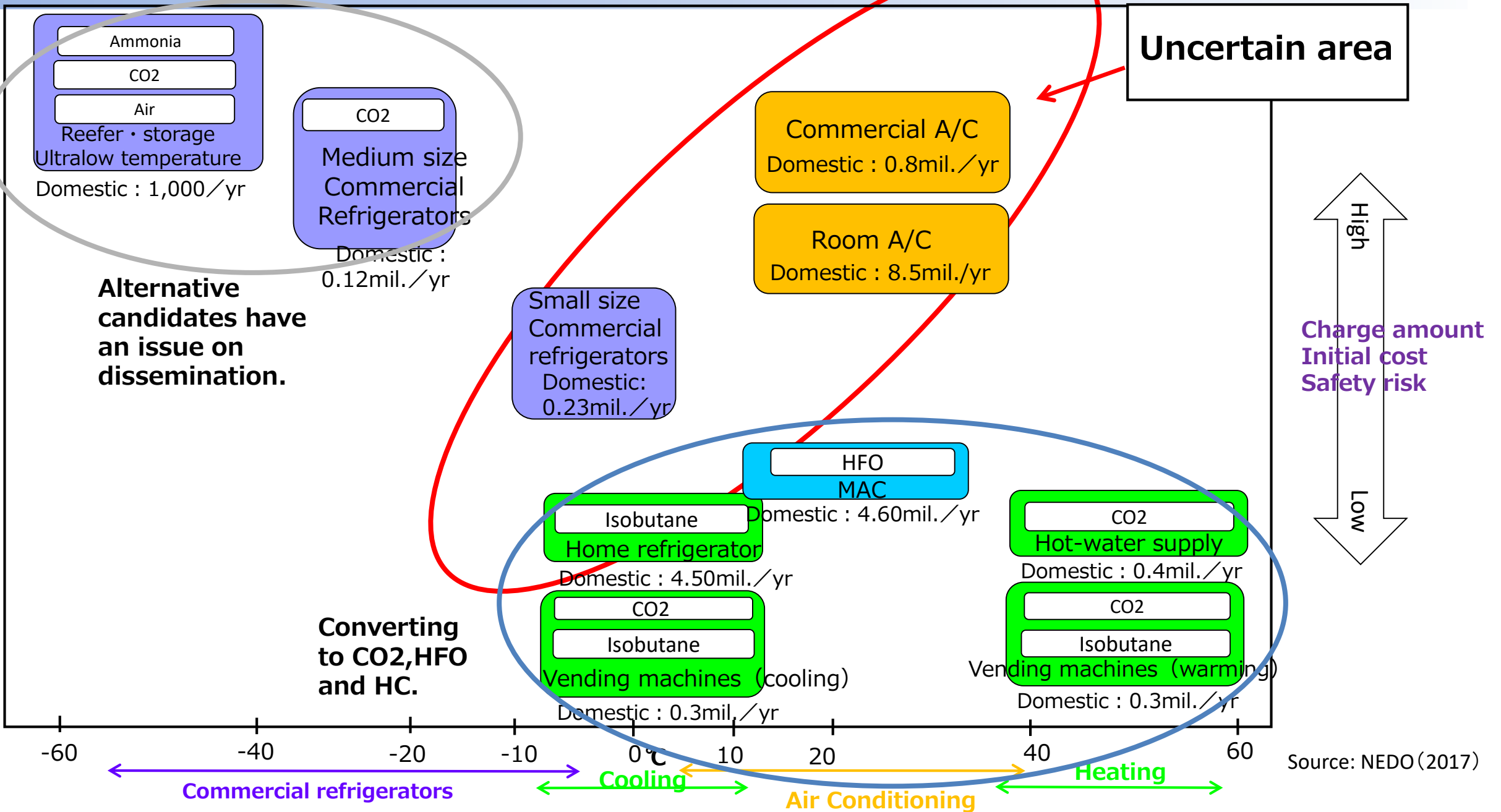
2 – 3. Status of consideration on domestic law revision

- Discussed basic issues to revise the domestic law complying with the Kigali Amendment at the joint working group with Ministry of the Environment in September 2017 and announce its report officially after the public comment in November 2017.
- Discussed concrete operation of quota system on production and imports at the working group in June and December 2017.



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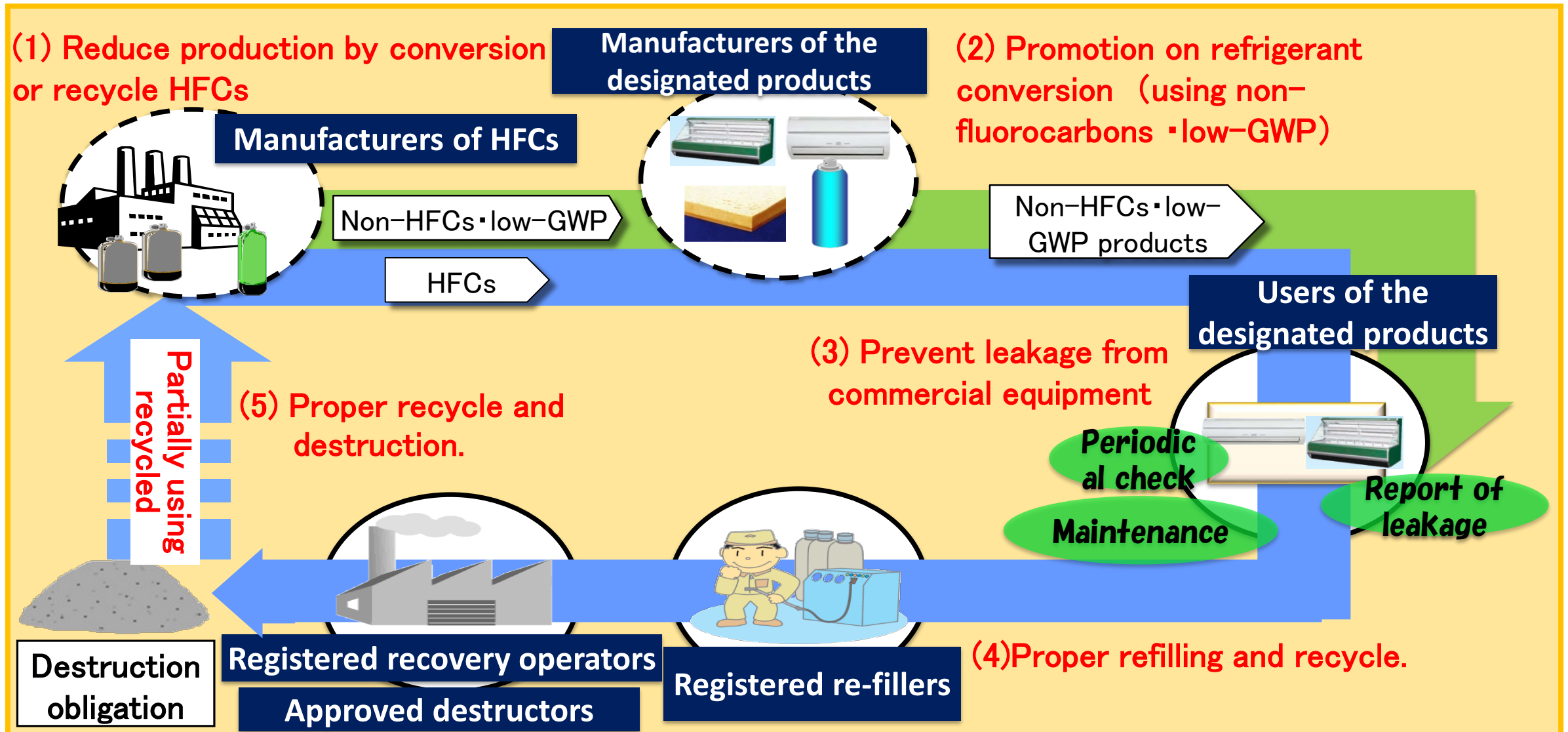
3 – 1. Alternate refrigerants mapping



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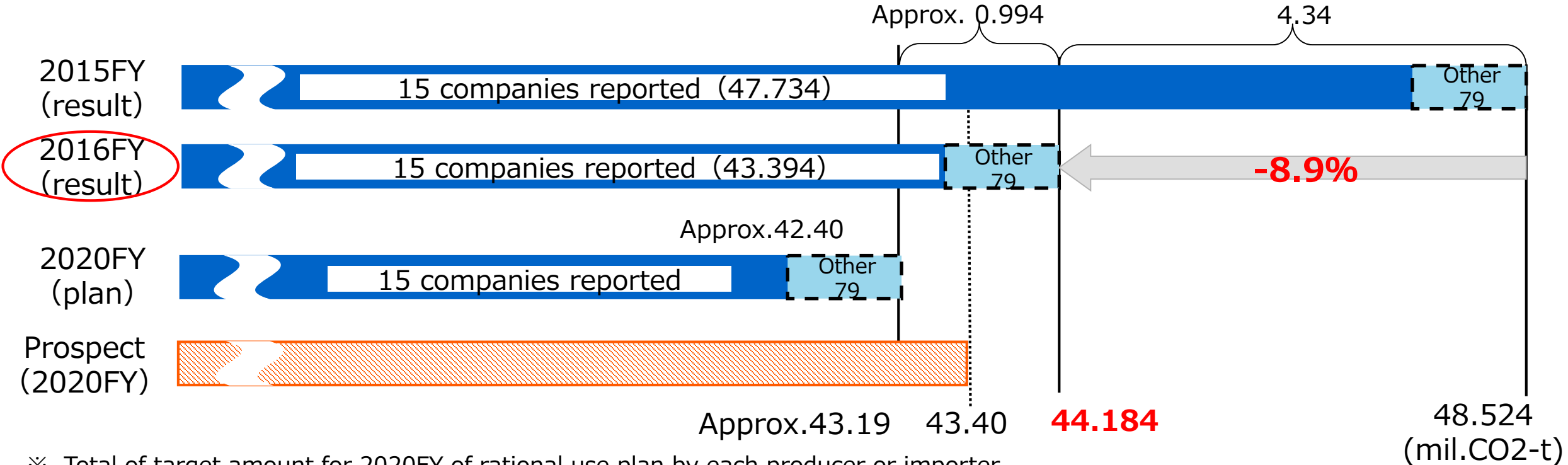
4 – 1. Overview of the Act covering entire life cycle

○The Act covering from production to disposal has been implemented since April 2015 in Japan ahead of the Kigali amendment.



4 – 2. Status of rational use plan by manufacturers and importers (2016FY)

- ✓ Total amount placed on the market in 2016FY taking into account small business operators (less than 0.01 mil .CO2-t) is estimated 44 .184 mil .CO2-t and 4.34 mil .CO2-t reduction (8.9% decrease over the previous FY) .
- ✓ Total of target amount for 2020FY of rational use plan by each producer or importer is approx. 43.19mil.CO2-t (※) and additional reduction of 0.994mil.CO2-t would be needed to meet the target.



※ Total of target amount for 2020FY of rational use plan by each producer or importer = Total of 15 companies reported (Approx. 42.40mil.CO2t) + total of 79 companies not reported (Assumed 0.01mil.CO2-t per company for both result and target value)

4 – 3. For Manufacturers and importers

○ Non-HFCs and low-GWP has been promoted by the manufacturers and importers based on the target value and year of the designated product under the act on Rational use and proper management of fluorocarbons. The designated product system has target for the seven different categories as indicated below.

Designated products	Current refrigerants and GWP value	Target GWP value	Target year
Room air conditioning (Except penetrate type and etc.)	R410A(2090) R32(675)	750	2018
Commercial air conditioning (Except floor stationary and etc.)	R410A(2090)	750	2020
Mobile air conditioning (Mounted equipment limited to passenger car (except capacity of more than 11 people))	R134a(1430)	150	2023
Condensing unit and stationary refrigeration unit (Except compressors with declared power less than 1.5kw and etc.)	R404A(3920) R410A(2090) R407C(1770) CO2(1)	1500	2025
Central cold storage warehouses (Only new equipment for more than 50,000m ³)	R404A(3920) Ammonia (single digit)	100	2019
Urethane foam (Only on-site blower for house building materials)	HFC-245fa(1030) HFC-365mfc(795)	100	2020
Dust blowers (Except uses that requires non-flammable)	HFC-134a(1430) HFC-152a(124) CO2(1), DME(1)	10	2019

○ New designated products stated at METI working group on 12/18

•「Industrial air conditioners (mandatory freeze level more than 3 tonnes)」 (Target GWP : 750, Target year : 2023)

•「Turbo refrigerators」 (Target GWP:100, Target year : 2025)