

Current Situation of Energy Efficiency, Safety and Lower GWP Refrigerant

Refrigerant conversion Activities in Japan

Part 1: Introduction of JRAIA

The Japan Refrigeration and Air Conditioning Industry Association

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Contents :

1. Who is JRAIA?
2. Japan's environmental policy
 - 1) Japan's NDC
 - 2) HFC reduction in Japan
3. Industry's commitment to environmental issue
 - 1) JRAIA's position on Carbon Neutrality
 - 2) Important Issues to be considered in refrigerant conversion
 - 3) Cooperation with Government and Academia

1. Who is JRAIA?

JRAIA(Japan Refrigeration and Air Conditioning Industries Association)

- **Established in Feb. 1949**
- Minato city, Tokyo (located in front of Tokyo Tower)
- Chairman: Katsuyuki Sawai (from DAIKIN Industries, Ltd.)
- The number of the members: **168 companies** incl. associate members as of June. 2024
- **Business Fields:**
 - Air conditioning (residential, commercial, automotive)
 - Refrigeration (commercial, industrial, transport)
 - Ventilation
 - Heat pump system (HP water heaters)
 - Refrigerants
 - Parts
- www.jraia.or.jp/english



2. Japan's environmental policy

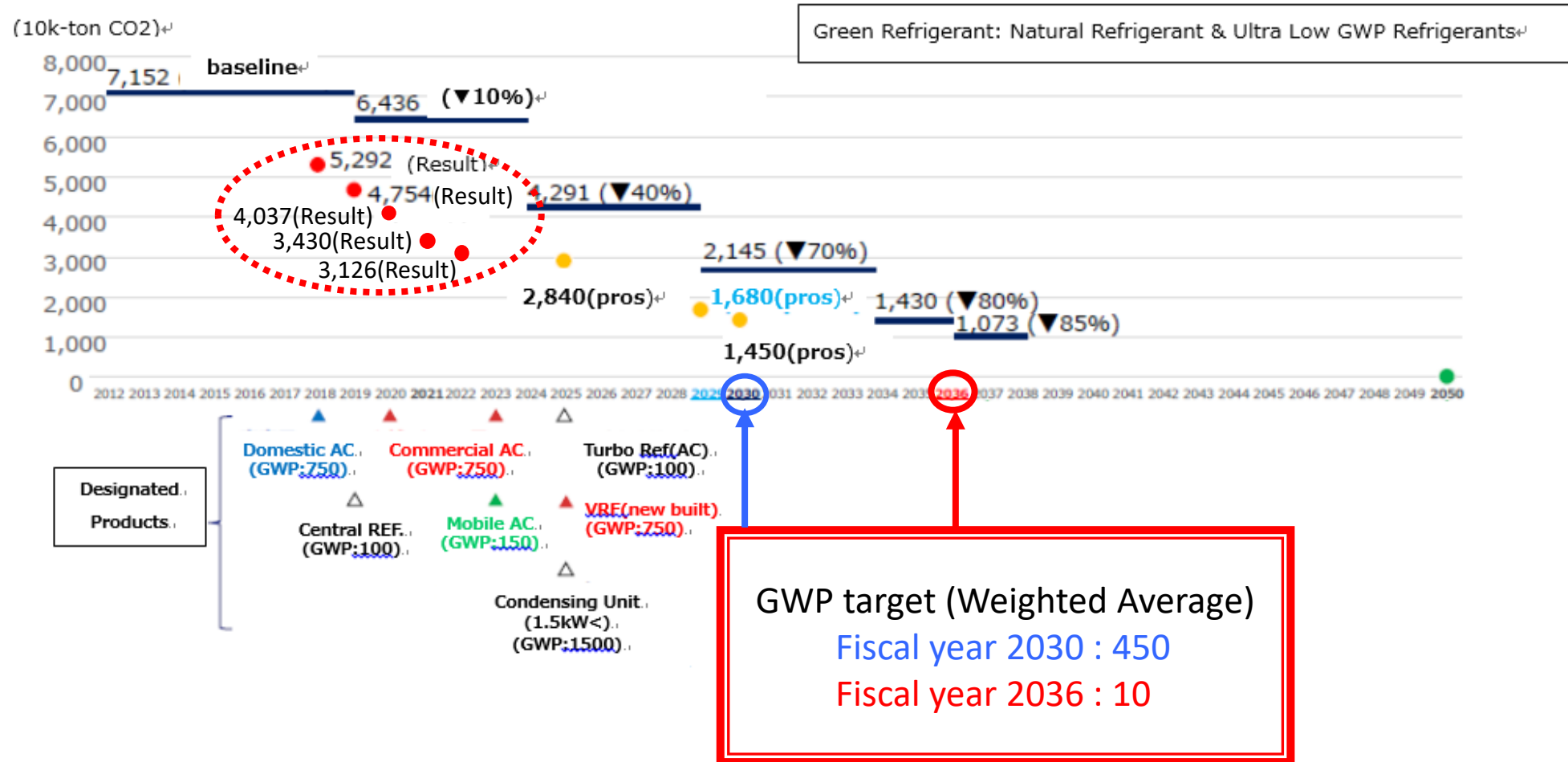
1) Japan's NDC - Cabinet decision on the "Plan for Global Warming Countermeasures" (22nd Oct.2021)

(Unit: million t – CO ₂)	Fiscal year 2013	Targets and estimates in fiscal year 2030	Reduction Ratio	Conventional target (Reduction Ratio)
Greenhouse gas emissions and removals	1,408	760	▲46%	▲26%
Energy-related CO ₂	1,235	677	▲45%	▲25%
Industry	463	289	▲38%	▲7%
Commercial and others	238	116	▲51%	▲40%
Residential	208	70	▲66%	▲39%
Transport	224	146	▲35%	▲27%
Energy conversion	106	56	▲47%	▲27%
Non-energy-related CO ₂ (CH ₄ , N ₂ O)	133.7	114.5	▲14%	▲8%
Four gases incl. HFC etc.	39.1	21.8	▲44%	▲25%
Greenhouse gas removals	-	▲48	-	-

2. Japan's environmental policy

2) HFC reduction in Japan

Implementation scenarios for green refrigerants and applicable equipment



3. Industry's commitment to environmental issue

1) JRAIA's position on Japanese Government Environment Policy

JRAIA will work towards the realization of Carbon Neutrality while considering S+3Es.

① HVAC&R industry's basic stance towards Carbon Neutrality :

- Aim to expand the use of heat pump technology and products that are also highly efficient from the perspective of utilizing renewable energy.
- Use the designated products to reduce HFCs as much as possible and explore the possibility of safe use of lower GWP, e.g. "Green refrigerants" such as natural refrigerants and ultra low-GWP refrigerants.

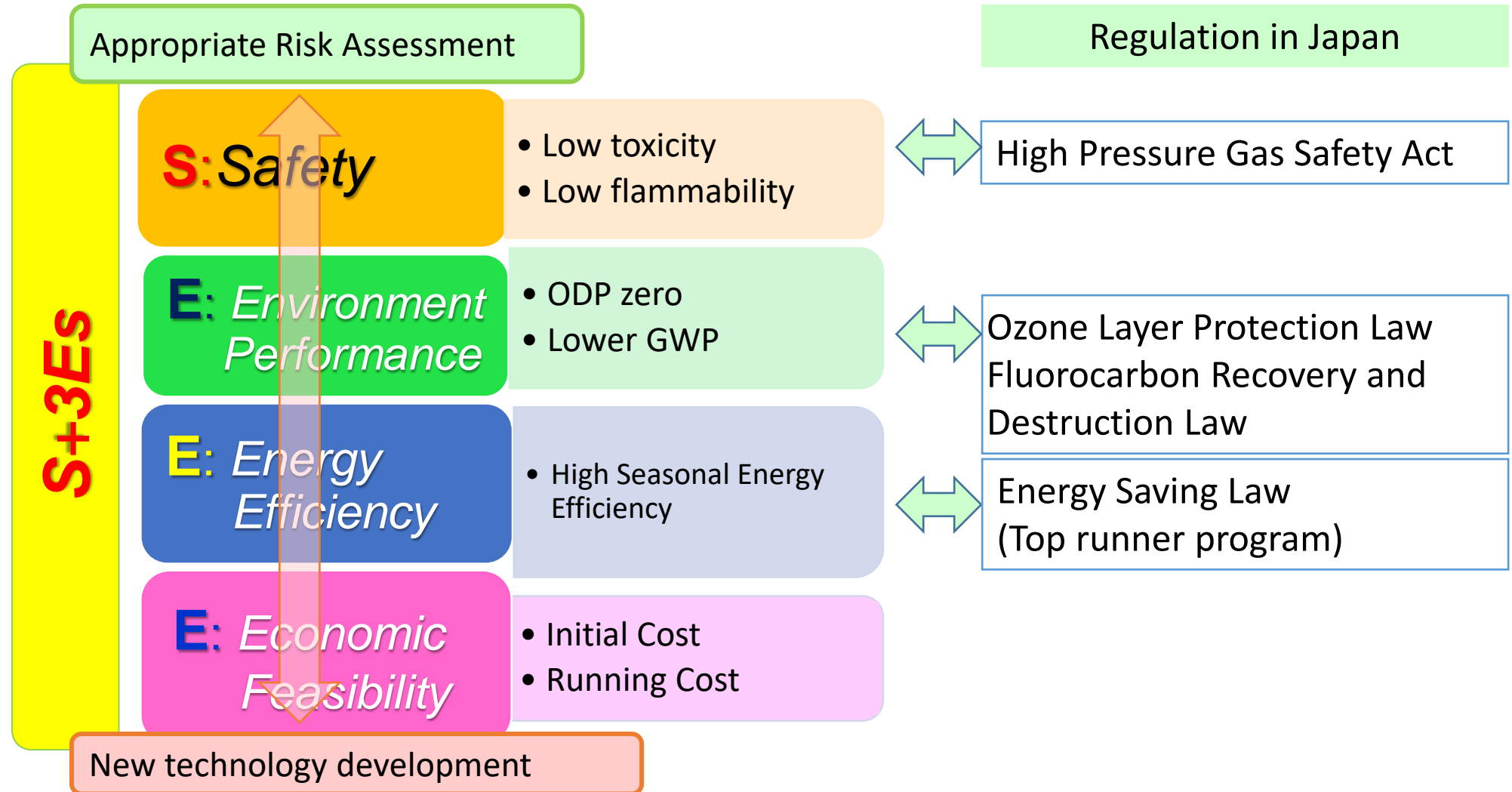
② Direction of response to Carbon Neutrality in HVAC&R sector: **Basic principle : S + 3Es**

Balanced target setting and target-driven activities on Safety plus Environment performance, Energy efficiency and Economic feasibility are important.

- **Safety(S)** : Ensure safety together with users(consumers), installers and other relevant stakeholders
- **Environment performance(E)** : Convert to lower GWP refrigerants from an environmental point of view.
- **Energy efficiency(E)** : Improve the efficiency of equipment systems from the perspective of improving energy efficiency (directly linked to the reduction of CO₂ emissions).
- **Economic feasibility(E)** : A reasonable price (cost) that balances the above three items is essential to promote market diffusion.

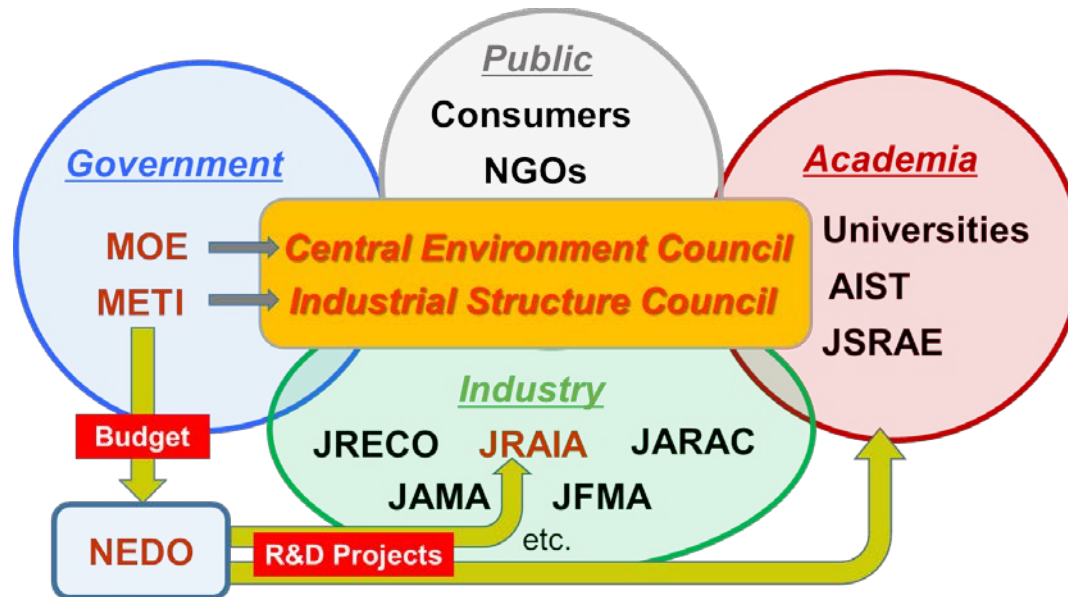
3. Industry's commitment to environmental issue

2) Important Issues to be considered in refrigerant conversion



3. Industry's commitment to environmental issue

3) Cooperation with Government and Academia



Government

MOE : Ministry of the Environment

METI : Ministry of Economy, Trade and Industry

NEDO : New Energy and Industrial Technology
Development Organization

Academia

AIST : National Institute of Advanced Industrial
Science and Technology

JSRAE : Japan Society of Refrigerating
and Air Conditioning Engineers

Industry

JRAIA : The Japan Refrigeration and Air Conditioning Industry Association

JARAC : Japan Association of Refrigeration and Air-conditioning Contractors

JRECO : Japan Refrigerants and Environment Conservation Organization

JFMA : Japan Fluorocarbon Manufactures Association

JAMA : Japan Automotive Manufactures Association