

Refrigerant Transition in China' R&AC Industry: Policy Drivers, Industry Progress

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- **Has been engaged in the implementation of the Montreal Protocol, technical development research and revision of regulations and standards in China's refrigeration and air-conditioning industry**

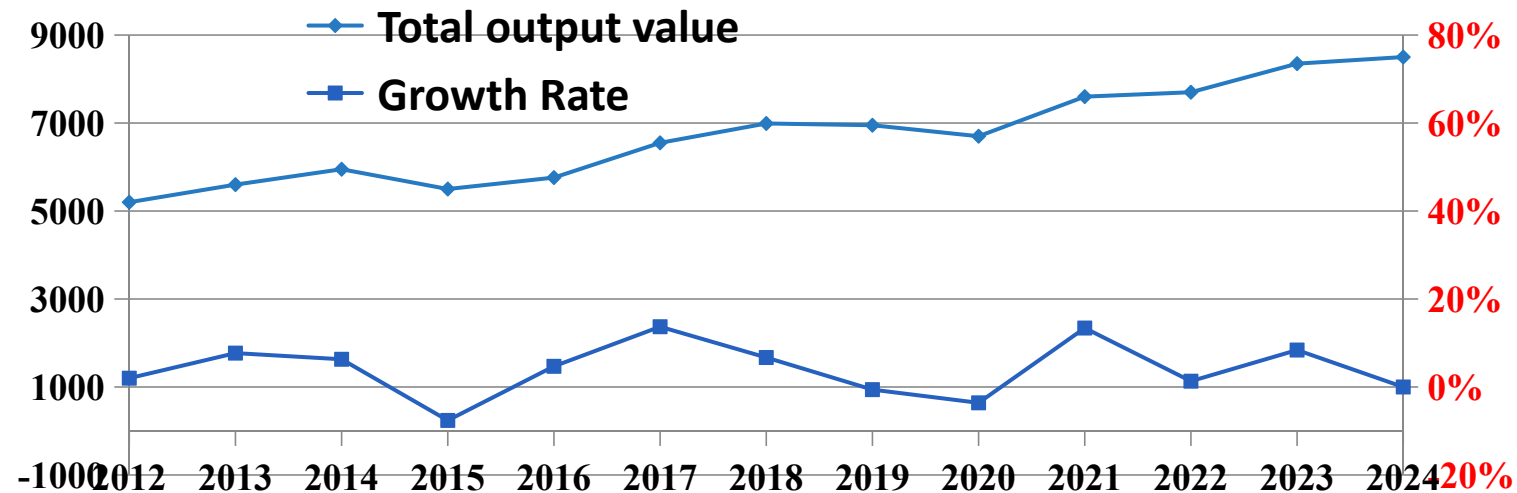
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- **1. China Refrigeration and Air-conditioning Industry Association (CRAA)**
- Founded in **1989** in Beijing
- **5A** Association in China
- More than **900** members from R&AC manufactures, institutes, academies, installation and servicing companies, consultants
- **Bridge** between government and enterprises
- **11** Branches

• 2. Status of Industry

- According to CRAA statistics, China's R&AC industry achieved a total output value of ¥ 850 billion in 2024, an increase of 1.8% compared with 2023. More specifically, the industrial and commercial sector achieved ¥ 440 billion, and the household AC sector achieved ¥ 410 billion, an increase of 9.3% compared with 2023.



• Refrigerant Consumption in China

No.	Product Category	Current refrigerants	Near-term/medium-term refrigerants	Long-term refrigerants
1	Room AC	R410A (2029.1.1) R32	R32/R290	Natural Refrigerants (NH3, CO2, HCs), HFOs?
2	Household fridge/freezer	R134a (2026.1.1) R600a, R290	R600a/R290	
3	Heat pump and water heater	R22 R410A/R134a R32	R32, CO2	
4	Small water chillers	R22 R410A/R407C R32	R32	
5	Large-mid water chillers	R22/R123 R134a	HFOs	
6	Unitary air conditioners	R22/R142b R410A/R134a/R407C R32	R32	
7	Multi-split air conditioning units	R410A	R32	
8	Freezer and refrigeration and condensing units	R22 R507A/R404A/R134a/R410A NH3, CO2, R290	NH3/CO2/R290/R600a/HFOs	

➤ HCFCs

HCFC-22 ≈ 100,000tons

HCFC-123:small

HCFC-142b:small

➤ HFCs

R410A ≈ 100,000tons

HFC-134a > 50,000tons

HFC-32≈ 100,000tons

R507A, R407C, R404A, R245fa... >30,000tons

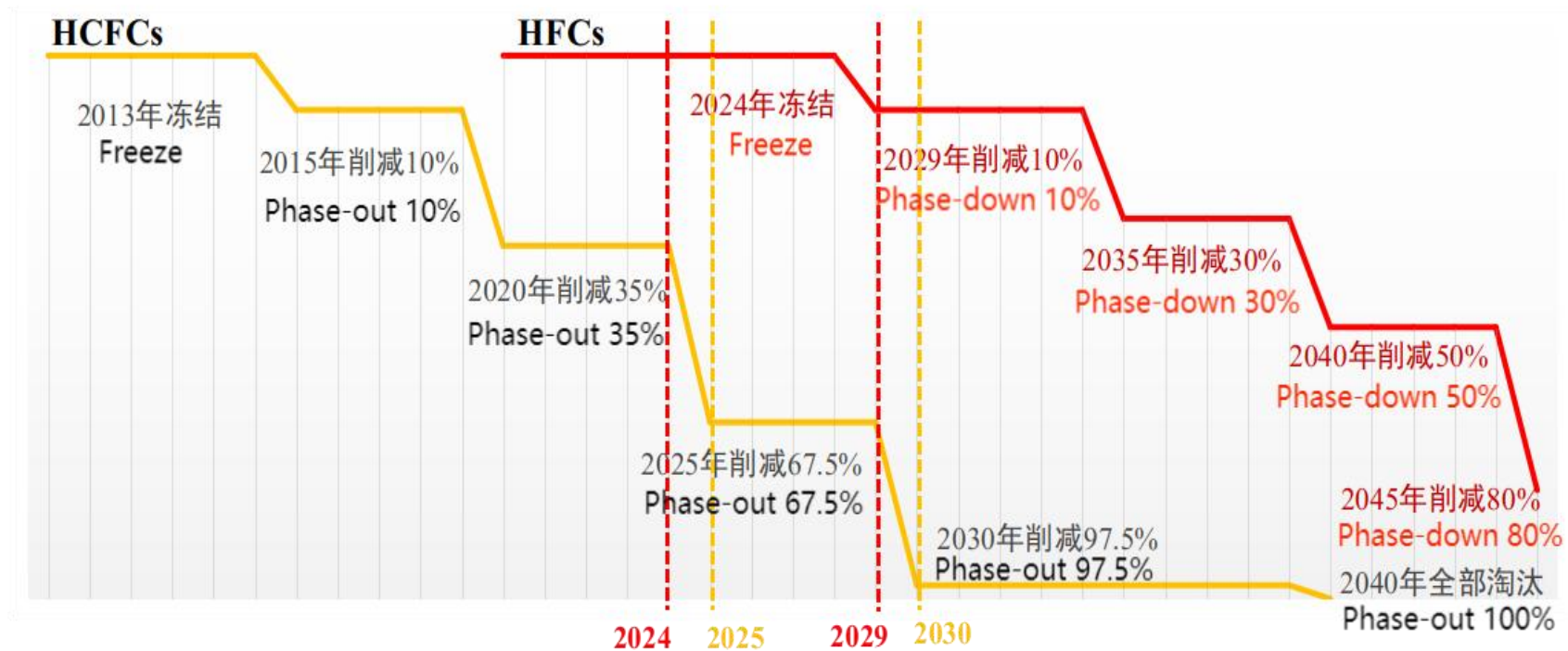
Natural Refrigerants

➤ Natural Refrigerants:

NH3、CO2、HC290、HC600a...> 10,000tons

Refrigerant Substitution Progress in China

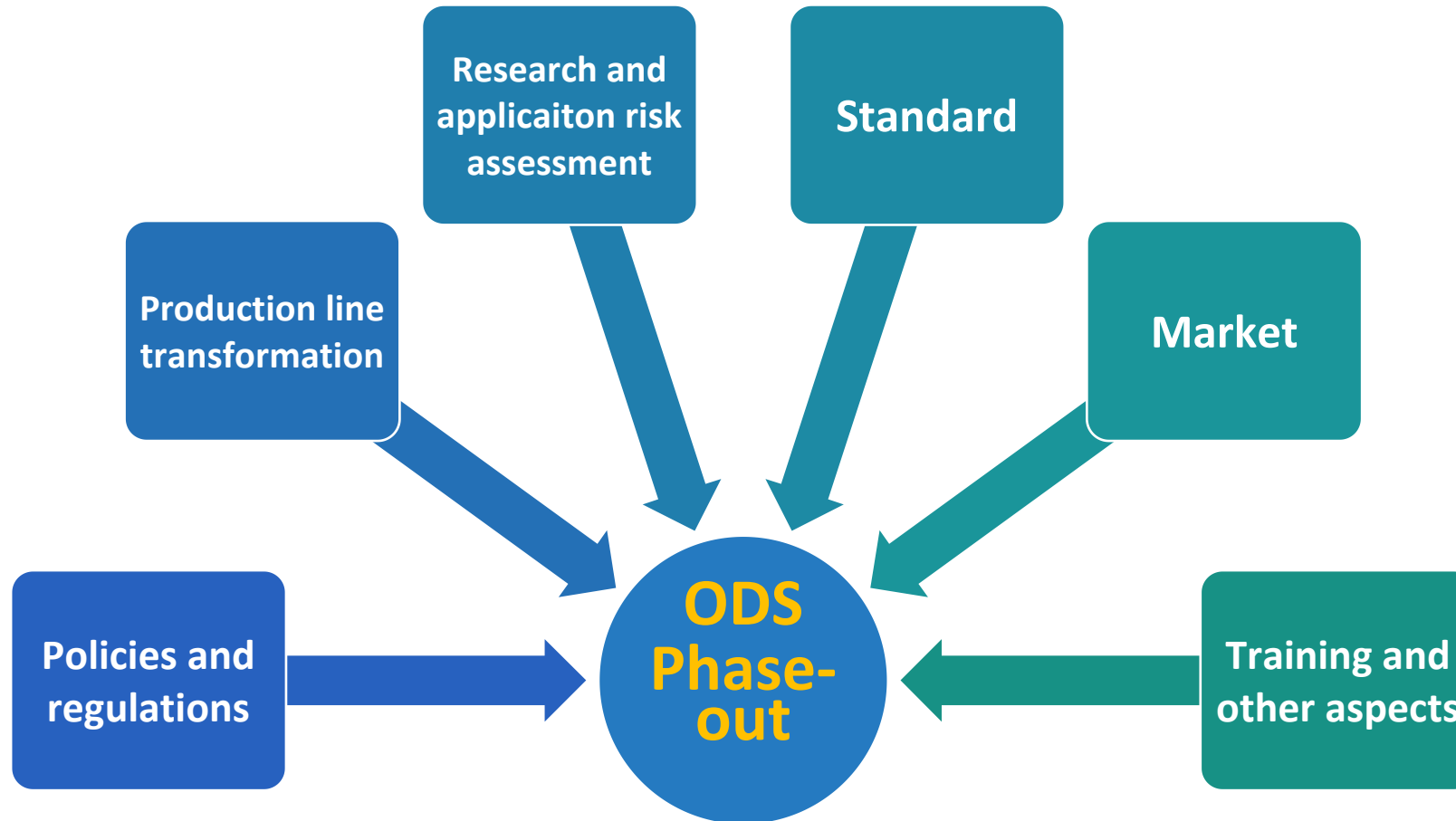
- China's national compliance actions are carried out strict accordance with the phase-out schedule stipulated in the Montreal Protocol(MP)



Policy and Implementation Leadership Award issued to MEE China at the ceremony commemorating the 30th Anniversary of the Montreal Protocol held by the Ozone Secretariat in 2017.

Refrigerant Substitution Progress in China

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The Chinese government promulgated a series of policies and regulations related to the MP implementation to ensure the achievement of the MP targets.

- ***ODS Management Regulation***

On March 24, 2010, the State Council adopted the "ODS Management Regulation", which came into effect on June 1, 2010

- As **the first regulation** to convert international environmental conventions into domestic laws
- Provided a **solid legal foundation** and **operational basis** for China's compliance with the Montreal Protocol and the phase-out of ODS.



On December 18, 2023, the "State Council Decision on Amending the Regulations on the ODS Management Regulation" was adopted and came into effect on **March 1, 2024.**

- meet the compliance requirements of the MP in the new era
- incorporate HFCs into the control framework
- enhance comprehensive lifecycle management
- strengthen legal liabilities



China's National Implementation Plan for the MP (2025-2030)



Specifies 9 categories of controlled substances



Defines compliance targets to be achieved by 2030



Proposes four key action initiatives

Strengthen source regulation

Improve end-of-pipeline treatment

Enhance import-export management

Reinforce process supervision

Schedule for HCFCs phase-out

Sub-sector	Products	Date
Household appliances	New	Jan. 1, 2030
Industry and commercial	Multi-connected air-condition units(new)	Jan.1, 2027
	Other products(new)	Jan. 1, 2030

Schedule for HFCs Phase-down in R&AC Products under the China's National Implementation Plan for the MP (2025-2030)

Sub-sector	Products	Date	GWP
Vehicle	Air conditioning systems for newly announced M1 passenger vehicles	July 1, 2029	GWP≤150
Household appliances	Domestic refrigerators and freezers	Jan. 1, 2026	no HFCs
	Room AC for domestic sale(excluding household multi-split systems)	Jan. 1, 2029	GWP≤750
Industry and commercial	Unitary air conditioners (with rated cooling or heating capacity≤12kW)	Jan. 1, 2029	GWP≤750
	Ducted air-supply air conditioning units (with rated cooling or heating capacity≤12kW)	Jan. 1, 2029	GWP≤750
	Other refrigeration equipment or systems (excluding those with an evaporation temperature below -50°C)	Jan. 1, 2029	GWP≤2500

ODS Quota and registraion

➤ ODS Information Management System (<http://new-ods.ozone.org.cn/>)

- ODS manufacturers and importers must apply for quotas for the following year by October 31st annually (ODS type, quantity, and intended use...)
- MEE will review the applications and allocate quotas
- Enterprises with an annual consumption of HCFCs exceeding 100t are required to apply for a usage quota
- Enterprises with annual HCFCs consumption below 100t, as well as enterprises using HFCs, are required to complete a registration (record filing)



Other related policies to implement MP

Authority	Policies/Regulations	Contents
MEE	Official Letter: Solicitation of Public Comments on the Announcement on Prohibiting the Production of Domestic Refrigerators and Freezers Using Hydrofluorocarbons (HFCs) as Refrigerants (Draft for Comment) (August 15, 2025)	
MEE\GACC\MOFCOM	Measures for the Administration of import and export of ODS (2025/5/1)	ODS import and export quota licensing management
MEE\MIIT	Recommended List of Alternatives to ODSs (2023)	Recommended R290, R600a,R744,R717 and R32 as substitutes in different applications
MEE\NDRC\MIIT	List of controlled ODS in China (updated in 2021)	Add HFCs to the list
MEE\MOFCOM\GACC	List of controlled ODS imported and exported by China (2021)	Since 2021.11.1, the import and export license management system has been strictly implemented for HFCs
MEE\NDRC\MIIT	Notice on strict control of the first batch of HFCs chemical production and construction projects (2021)	Since January 1, 2022, it is prohibited to build or expand chemical production construction projects of five HFCs substances (R32, R134a, R125, R143a, R245fa)

Related safety standards

GB/T 4706.32-2024 Safety of household and similar electrical appliances—Part 32: Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers

- Issued on July 24, 2024, and will be implemented on August 1, 2026, adopting IEC60335.2-40:2022 identically

GB/T 4706.102-2024 Safety of household and similar electrical appliances—Part 102: Particular requirements for commercial refrigerating appliances and ice-makers with an incorporated or remote refrigerant unit or motor-compressor

- Issued on July 24, 2024, and will be implemented on August 1, 2026, adopting IEC 60335-2-89:2019 identically

GB/T 7778-2014 Number designation and safety classification of refrigerants

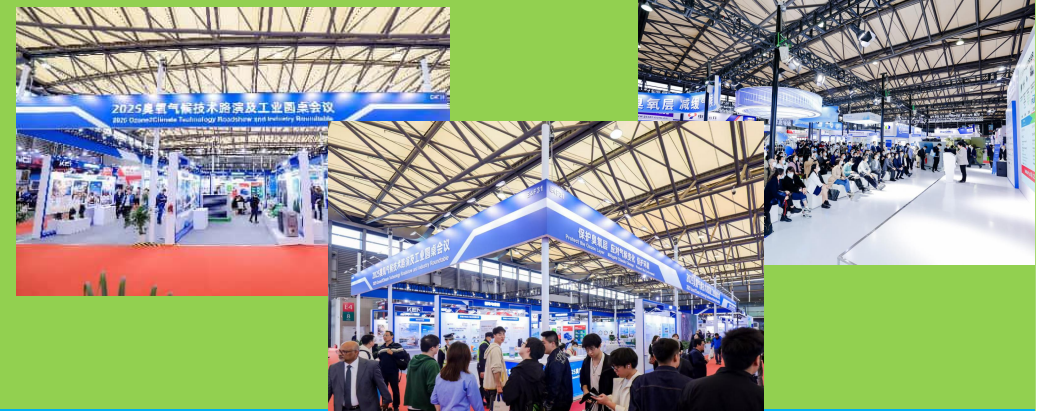
- The revision was initiated on July 1, 2025, and will adopts ISO 817:2024 with modifications

GB/T 9237-2017 Refrigerating systems and heat pumps—Safety and environmental requirements

- The revision was initiated on August 6, 2025, and will adopts ISO5149 with modifications

Marketing & Promotion and Capacity Building Activities

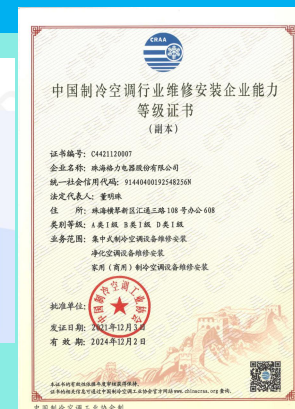
- Ozone2Climate Technology Industry Roundtable and Roadshow
 - 2026.4.8-10, Beijing



- Good practice training program for servicing sector



- Competency Certification System for R&AC Equipment Servicing Companies

4.Summary(Future challenges)

- **China's R&AC industry is facing a series of difficulties and challenges such as technology selection, policy and regulation support, security, cost, and market acceptance for alternative conversion job.**
- **Promoting a large number of SMEs to complete the conversion job is another important task that China R&AC industry needs must tackle**
- **China R&AC industry has long been promoting refrigerant substitution and conversion with a responsible attitude, we should choose realistic and resonable alternative technologies and refrigerants for the future from the perspective of life cycle climate perfromance(LCCP), taking into consideration various factors such as safety, environmental protection, energy efficiency, and economy. We should ensure the completion of industry performance targets while striving to achieve the optimal synergy between low-carbon environmental protection and economic development .**

Thank you!

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