



Final Technology Transitions Rule under the American Innovation and Manufacturing (AIM) Act

November 17, 2023

Today's Host



Annie Kee

Environmental Protection Specialist
U.S. Environmental Protection Agency (EPA)
Stratospheric Protection Division
Email: kee.annie@epa.gov



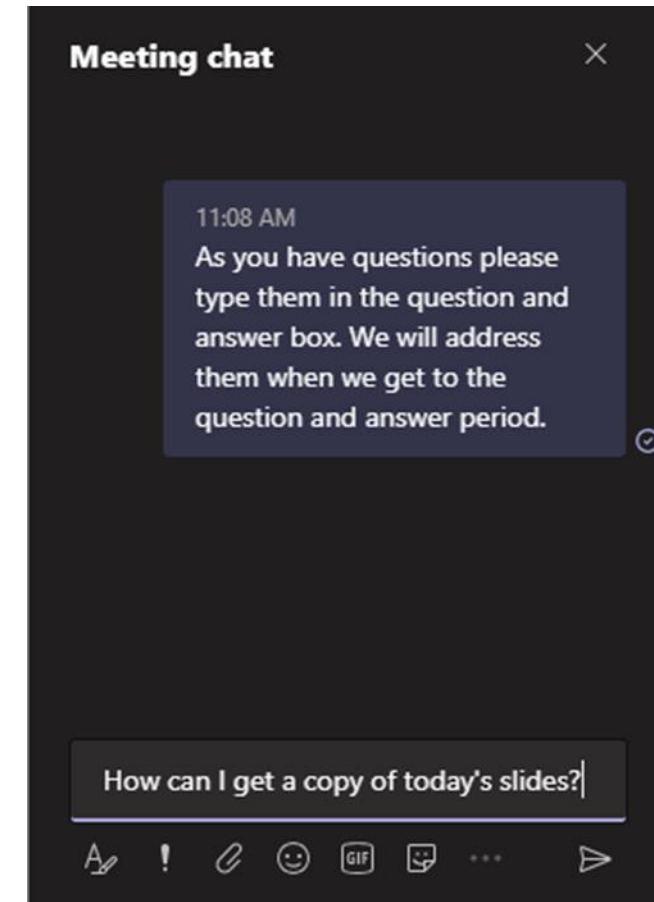
Annie is an Environmental Protection Specialist in the Stratospheric Protection Division (SPD) in EPA's Office of Atmospheric Protection, where she works on rulemakings under the American Innovation and Manufacturing (AIM) Act and partnership programs. Prior to SPD, she also worked on EPA's SmartWay program, which helps companies advance supply chain sustainability by improving freight transportation efficiency.

Questions



Question and Answer (Q&A) Session

- Participants are muted
- Questions will be moderated at the end
- To ask a question, enter your comment into the chat box



Webinar Feedback and Materials



Feedback Form

- We value your input!
- The link to a feedback form will appear in the chat window

Recording and Slides

- Webinar is being recorded
- Materials will be posted on the GreenChill website under Events and Webinars: www.epa.gov/greenchill
- To receive notification when materials are posted email: EPA-GreenChill@abtassoc.com

Program Overview



www.epa.gov/greenchill

GreenChill is a voluntary partnership program that works collaboratively with the food retail industry to reduce refrigerant emissions and decrease stores' impact on the ozone layer and climate system

GreenChill works to help food retailers:

- Lower refrigerant charge sizes and eliminate leaks
- Transition to environmentally friendlier refrigerants
- Adopt green refrigeration technologies and best environmental practices

Become a GreenChill Partner!



**Join your
Industry Peers!**

*GreenChill is
actively recruiting
new Food Retail
Partners*



Request a
partnership packet



Sign the partnership
agreement



Meet eligibility
requirements



Become a GreenChill
partner!

The GreenChill Partnership Process

epa.gov/greenchill/about-greenchill-corporate-emissions-reduction-program

Upcoming GreenChill Webinars

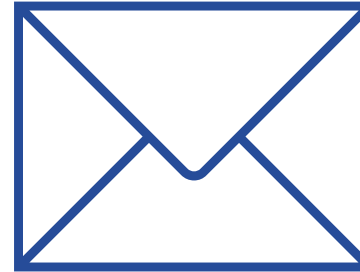


- **December 13**, 3 pm Eastern: Leak Detection with presenters from Matelex
- **January 17**, 1 pm Eastern: refrigerant management systems with presenters from DC Engineering

We are planning GreenChill's 2024 webinar series. Have ideas for a webinar or would you like to present? Email GreenChill@epa.gov

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Today's Speakers...

Allison Cain

Environmental Policy Analyst
Stratospheric Protection Division

U.S. EPA

Email: Cain.Allison@epa.gov



Allison is an environmental policy analyst with the Stratospheric Protection Division. Allison joined EPA in early 2022 and is one of the lead rule writers for the Technology Transitions rule under subsection (i) of the AIM Act.

Erin Birgfeld



Erin Birgfeld

Branch Supervisor

Technology Transitions Branch

Stratospheric Protection Division

U.S. EPA

Email: birgfeld.erin@epa.gov

Erin is a branch supervisor with the Stratospheric Protection Division. Erin joined EPA in 1999 and has spent her career working on a number of different climate programs. Erin joined SPD as a branch supervisor in 2022.



TECHNOLOGY TRANSITIONS PROGRAM

Technology Transitions Branch, Stratospheric Protection Division
U.S. Environmental Protection Agency

GreenChill Webinar
November 17, 2023

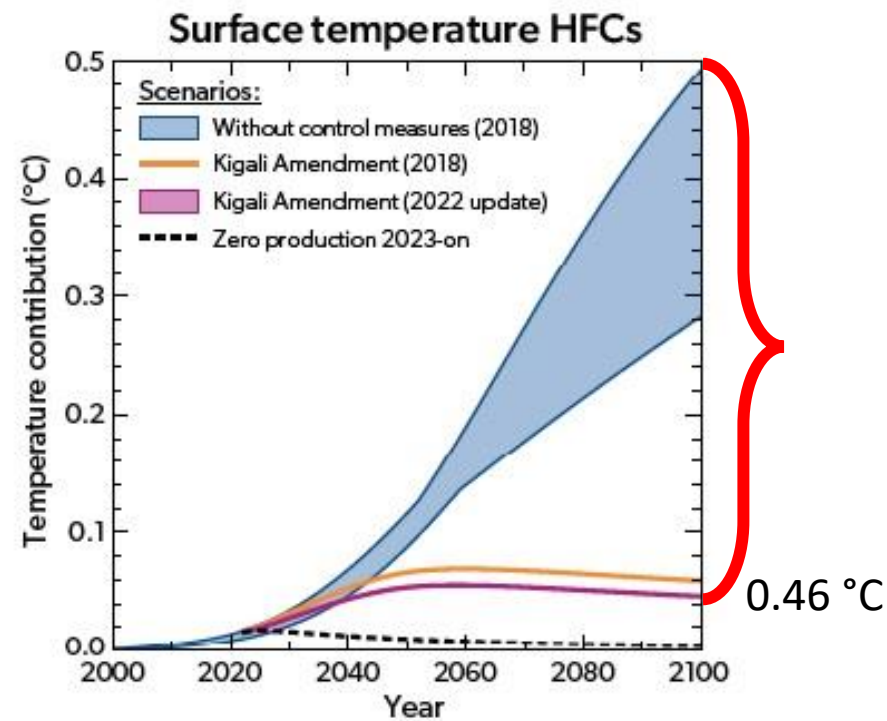
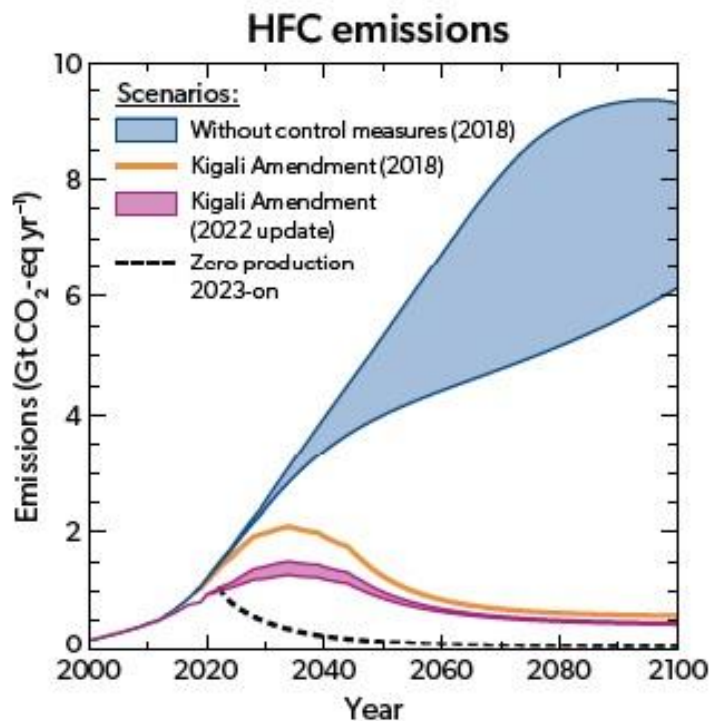
Outline

- American Innovation and Manufacturing (AIM) Act Overview
- Final Technology Transitions Rule
- Proposed Emissions Reduction and Reclamation Rule
- Questions & Answers



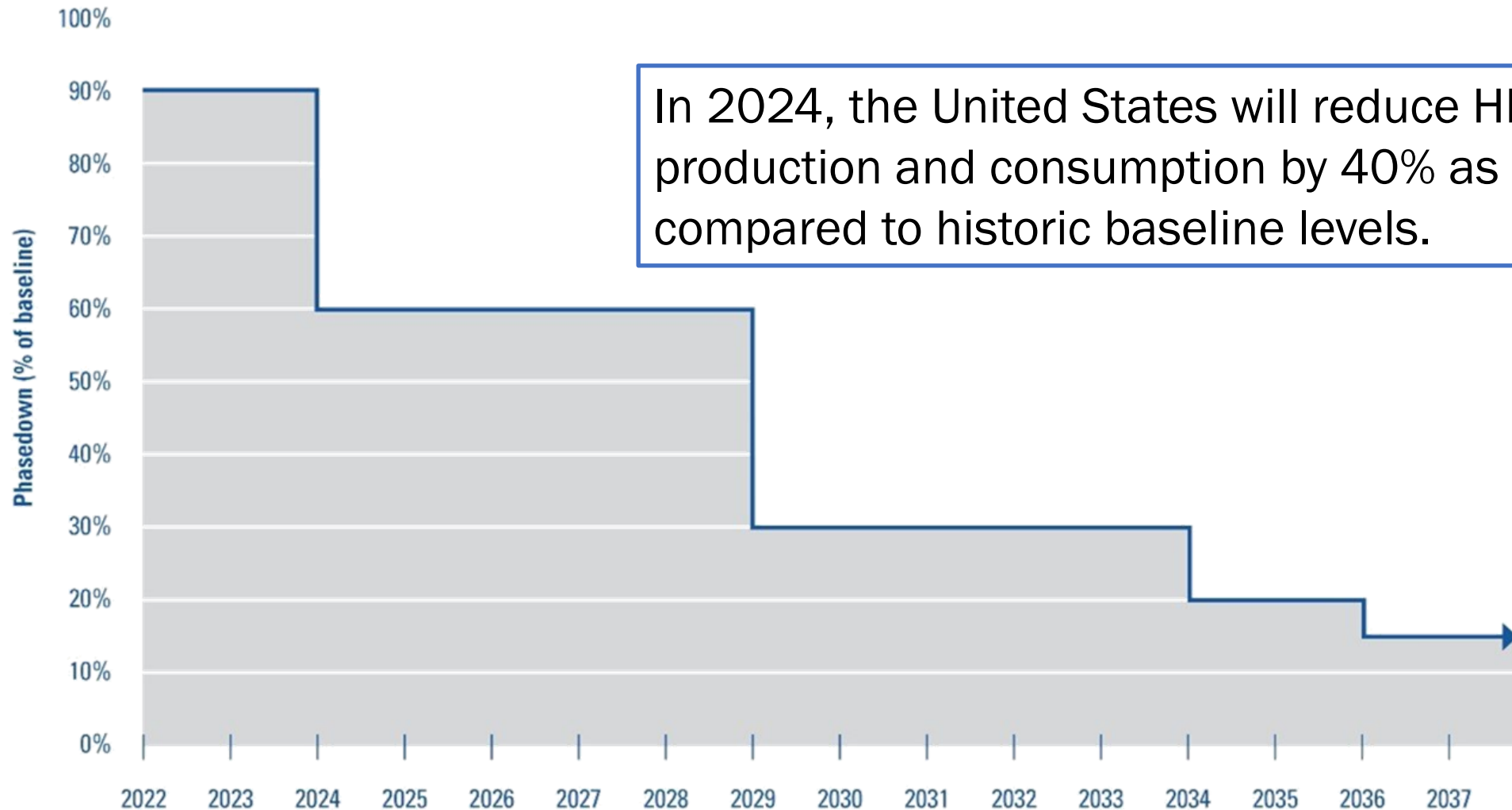
A global HFC phasedown is expected to avoid up to 0.5 °C of global warming by 2100

- Hydrofluorocarbons (HFCs) are used as replacements for ozone-depleting substances (ODS) in refrigeration, air conditioning, foam blowing, aerosols, and fire suppression
- HFCs are climate-damaging greenhouse gases with global warming potentials (GWPs) hundreds to thousands of times higher than carbon dioxide (CO₂)
- Absent effective regulations, HFC use and emissions are expected to continue increasing rapidly worldwide



World Meteorological Organization Scientific Assessment of Ozone Depletion: 2022, Global Atmosphere Watch Report No. 278, Figure ES-4



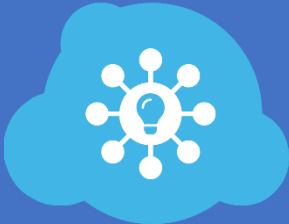
HFC Phasedown Schedule



The American Innovation & Manufacturing (AIM) Act

- Phases down HFC production and consumption by 85% by 2036
 - Lists 18 HFCs as regulated substances
- The AIM Act authorizes EPA to address HFCs in three main ways:
 1. Phase down HFC production and consumption through an allowance allocation and trading program
 2. Promulgate certain regulations for purposes of maximizing reclamation and minimizing releases of HFCs and their substitutes from equipment
 3. ***Facilitate sector-based transitions to next-generation technologies through restrictions on HFCs***

Overview of Regulatory Actions to Date

Program	 HFC Allocation Program		 Emissions Reduction and Reclamation Program		 Technology Transitions Program	
AIM Act Section	Subsection (e) – Phasedown of Production and Consumption of HFCs		Subsection (h) – Management of Regulated Substances		Subsection (i) – Technology Transitions	
Regulatory Actions	“HFC Allocation Framework Rule”	Published 10/5/2021 (86 FR 55116)	Notice of Data Availability	Published 10/17/2022 (87 FR 62843)	“Technology Transitions Rule”	Published 10/24/2023 (88 FR 73098)
	“Allocation Rule for 2024 and Later Years”	Published 7/20/2023 (88 FR 46836)	“Emissions Reduction and Reclamation Rule”	Published 10/19/2023 (88 FR 72216)		



TECHNOLOGY TRANSITIONS FINAL RULE

Overview of Subsection (i) - Technology Transitions

- Subsection (i) of the AIM Act authorizes EPA to restrict HFC uses
 - EPA can restrict, fully, partially, or on a graduated schedule, the use of regulated HFCs in any sector or subsector where HFCs are used
- EPA can initiate rulemakings on its own, or
- Individuals and organizations can petition EPA
 - Petitions trigger a clock



Statutory Factors

EPA must consider, to the extent practicable, the following factors when considering potential restrictions:

A. Best available data

B. Availability of substitutes:

- technological achievability
- commercial demands
- safety
- consumer costs
- building codes
- appliance efficiency standards
- affordability for residential and small business consumers
- other relevant factors, including the quantities of regulated substances available from reclaiming, prior production, or prior import

C. Overall economic costs and environmental impacts, as compared to historical trends

D. Remaining phase-down period for regulated substances under the final Allocation Rule

2023 Final Technology Transitions Rule – Overview

- Published October 24, 2023
- Responds to petitions granted in October 2021 and September 2022
- Restricts the use of higher-GWP HFCs in a new equipment in over 40 subsectors across the aerosol, foam, and refrigeration, air conditioning, and heat pump (RACHP) sectors
- Requires labeling
- Requires annual reporting
- Establishes a process for responding to future petitions



2023 Final Technology Transitions Rule – Benefits

- Up to in 876 million metric tons of avoided CO₂ equivalent emissions between 2025 and 2050
- Up to \$4.5 billion in savings for consumers and businesses largely from lower cost refrigerants and energy efficiency gains
- These benefits are in addition to those already accounted for in the Allocation Framework Rule

RACHP Products vs Systems

- A **product** is functional upon leaving a factory
 - Examples of products include window air conditioning units, refrigerators, and stand-alone refrigerator display cases
- A **system** is assembled and charged in the field using multiple components
 - An example is a supermarket direct expansion system that includes a centralized compressor room
 - Components are equipment such as compressors, condensers, and evaporators

2023 Final Technology Transitions Rule – Restrictions

- Restricts the manufacture and import of new **products** that use HFCs above a specified GWP threshold
- Prohibits the sale, distribution, and export of non-compliant **products** after three years
- Prohibits installation of new RACHP **systems** that use HFCs above a specified threshold
- No restrictions on manufacture, import, sale, distribution, or export of **components** used to repair existing RACHP systems



This rule does not restrict the continued use of any **existing** products or RACHP systems.

A product or system may be serviced and repaired throughout its useful life; this includes replacing components, as needed.

Commercial Refrigeration Product Restrictions and Compliance Dates

Subsector	Product	Global Warming Potential Limit or Prohibited Substances	Manufacture and Import Compliance Date
Retail food - refrigeration stand-alone units	Retail food - refrigeration stand-alone units	150	January 1, 2025
Retail food - refrigerated food processing and dispensing equipment	500 g of refrigerant or less and outside scope of UL 621, edition 7	150	January 1, 2027
Retail food - refrigerated food processing and dispensing equipment	More than 500 g of refrigerant and outside scope of UL 621, edition 7	R-402A, R-402B, R-404A, R-407A, R-407B, R-407C, R-407F, R-407H, R-408A, R-410A, R-410B, R-411A, R-411B, R-417A, R-417C, R-420A, R-421A, R-421B, R-422A, R-422B, R-422C, R-422D, R-424A, R-426A, R-427A, R-428A, R-434A, R-437A, R-438A, R-507A, HFC-134a, HFC-227ea, R-125/290/134a/600a (55/1/42.5/1.5), RB-276, RS-24 (2002 formulation), RS-44 (2003 formulation), GHG-X5, Freeze 12	January 1, 2027
Retail food - refrigerated food processing and dispensing equipment	Ice cream makers within the scope of UL 621, edition 7	R-402A, R-402B, R-404A, R-407A, R-407B, R-407C, R-407F, R-407H, R-408A, R-410A, R-410B, R-411A, R-411B, R-417A, R-417C, R-420A, R-421A, R-421B, R-422A, R-422B, R-422C, R-422D, R-424A, R-426A, R-427A, R-428A, R-434A, R-437A, R-438A, R-507A, HFC-134a, HFC-227ea, R-125/290/134a/600a (55/1/42.5/1.5), RB-276, RS-24 (2002 formulation), RS-44 (2003 formulation), GHG-X5, Freeze 12	January 1, 2028

*These tables are for informational purposes only and should not be relied on for compliance purposes. Please refer to 40 CFR Part 84, Subpart B for full details.

**Sale, distribution, and export of these products is prohibited three years after the manufacture and import compliance date.



Commercial Refrigeration System Restrictions and Compliance Dates

Subsector	System	Global Warming Potential Limit or Prohibited Substances	Installation Compliance Date ⁵
Retail food - supermarkets	With 200 or more lb refrigerant charge, excluding high temperature side of cascade system	150	January 1, 2027
Retail food - supermarkets	With less than 200 lb refrigerant charge	300	January 1, 2027
Retail food - supermarkets	High temperature side of cascade systems	300	January 1, 2027
Retail food - remote condensing units	With 200 or more lb refrigerant charge, excluding high temperature side of cascade system	150	January 1, 2026
Retail food - remote condensing units	With less than 200 lb refrigerant charge	300	January 1, 2026
Retail food - remote condensing units	High temperature side of cascade system	300	January 1, 2026



*These tables are for informational purposes only and should not be relied on for compliance purposes. Please refer to 40 CFR Part 84, Subpart B for full details.

** EPA is restricting the installation of new field-assembled systems. Components used to repair existing systems are not subject to these restrictions.

Commercial Refrigeration System Restrictions and Compliance Dates

Subsector	System	Global Warming Potential Limit or Prohibited Substances	Installation Compliance Date ⁵
Retail food - remote refrigerated food processing and dispensing equipment	Retail food - remote refrigerated food processing and dispensing equipment	R-402A, R-402B, R-404A, R-407A, R-407B, R-407C, R-407F, R-407H, R-408A, R-410A, R-410B, R-411A, R-411B, R-417A, R-417C, R-420A, R-421A, R-421B, R-422A, R-422B, R-422C, R-422D, R-424A, R-426A, R-427A, R-428A, R-434A, R-437A, R-438A, R-507A, HFC-134a, HFC-227ea, R-125/290/134a/600a (55/1/42.5/1.5), RB-276, RS-24 (2002 formulation), RS-44 (2003 formulation), GHG-X5, Freeze 12	January 1, 2027

*These tables are for informational purposes only and should not be relied on for compliance purposes. Please refer to 40 CFR Part 84, Subpart B for full details.

** EPA is restricting the installation of new field-assembled systems. Components used to repair existing systems are not subject to these restrictions.

Existing Systems and Products

This rule does not restrict the continued use of existing systems

- Existing systems can be serviced and repaired throughout their useful life
- Components needed to repair existing RACHP systems may continue to be manufactured, imported, sold, distributed, or exported

2023 Final Technology Transitions Rule – Compliance

Dates

Compliance dates vary based on sector and subsector

- Earliest restrictions start January 1, 2025, (or model year 2025 for motor vehicles)
- Latest restrictions start January 1, 2028

Labeling

New products, components, and systems using HFCs must be labeled based on compliance dates for the relevant subsector

Reporting

Companies that manufacture or import products or components covered by this rule must report certain information to EPA

- Annual reporting
- Begins in 2026 with 2025 data for all sectors

Labeling and Reporting – Commercial Refrigeration Subsectors

Labeling for commercial refrigeration systems and products

- Products, components, and systems must be labeled with:
 - HFC or HFC blend being used
 - Date of manufacture or first charge (minimum 4-digit year)
 - Charge size (for applicable subsectors)
 - Components not permitted for new installs must be labeled “for servicing only”

Reporting

- Manufacturers and importers for products and components covered by the rule must report:
 - Subsector, HFC or HFC blend used, charge size, quantity manufactured, imported, and exported
 - First reports for all subsectors are due **March 31, 2026**

Technology Transitions Program Resources

- Program website
 - www.epa.gov/climate-hfcs-reduction/technology-transitions
- Final Rule fact sheet
 - www.epa.gov/system/files/documents/2023-10/technology-transitions-final-rule-fact-sheet-2023.pdf
- GWP restrictions and compliance dates by sector and subsector
 - www.epa.gov/climate-hfcs-reduction/technology-transitions-hfc-restrictions-sector
- Frequent questions
 - www.epa.gov/climate-hfcs-reduction/phasedown-hydrofluorocarbons-final-rule-frequently-asked-questions



PROPOSED RULE: SNAP RULE 26

Significant New Alternatives Policy (SNAP)

Proposed Rule 26 – Published in May 2023

- Proposed to list eight refrigerants as acceptable, subject to use conditions, for use in retail food refrigeration systems
- Revise use conditions for one refrigerant, for use in self-contained commercial ice machines and stand-alone retail refrigeration equipment
- Adopt the current versions of three industry standards by incorporating them by reference into the relevant use conditions
- Exempt R-290 from the Clean Air Act section 608 prohibition on releases of refrigerant during installing, maintaining, repairing, or disposing of refrigerated food processing and dispensing equipment on the basis of information that such releases are not expected to pose a threat to the environment
- Expected final rule in early 2024

SNAP Rule 26 Proposed Listings

Sector	End-Uses	Alternatives	ODP	GWP	Flammable	Use Conditions
Ref/AC	Retail food refrigeration: <ul style="list-style-type: none"> • Supermarket* systems • Remote condensing units • Stand-alone units • Refrigerated food processing and dispensing 	HFO-1234yf HFO-1234ze R-454A R-454C R-455A R-457A R-516A	0	<300	Yes, mildly flammable	Acceptable subject to use conditions
Ref/AC	Retail food refrigeration: <ul style="list-style-type: none"> • Stand-alone units • Refrigerated food processing and dispensing • Commercial ice machines 	R-290 (propane)	0	~3	Yes, highly flammable	Acceptable subject to use conditions

SNAP Rule 26 Proposed Listings (cont.)

Sector	Suggested End-Uses	Alternatives	ODP	GWP	Flammable	Use Conditions
Ref/AC	Commercial ice machines	HFO-1234yf R-454A R-454C R-455A R-457A R-516A	0	<300	Yes, mildly flammable	Acceptable subject to use conditions
Ref/AC	Industrial process refrigeration Cold storage warehouses Ice rinks	HFO-1234yf HFO-1234ze(E) R-454A R-454C R-455A R-457A R-516A	0	<300	Yes, mildly flammable	Acceptable subject to use conditions



PROPOSED RULE: EMISSIONS REDUCTION AND RECLAMATION

Proposed Emissions Reduction and Reclamation Rule

- Proposed Emissions Reduction and Reclamation rule was published on October 19, 2023 ([88 FR 72216](#))
 - Would establish an Emissions Reduction and Reclamation program for the management of HFCs and certain substitutes
 - Certain provisions apply to both new and existing equipment
- Process
 - 60-day public comment period, closes on **December 18, 2023**
 - EPA held a virtual public hearing and presented to GreenChill on Nov. 13, 2023
 - Docket ID: EPA-HQ-OAR-2022-0606

Subsection (h) NPRM – Overview of Proposed Rule

EPA is proposing:

- Leak repair provisions for certain appliances
- Use of automatic leak detection (ALD) systems for certain new and existing equipment;
- A reclamation standard
- Use of reclaimed HFCs for certain types of equipment in certain refrigeration, air conditioning, and heat pump (RACHP) subsectors and use of recycled HFCs in fire suppression equipment
- Certain requirements for the fire suppression sector, including technician training
- Recovery of HFCs from disposable cylinders prior to disposal
- Container tracking for HFCs that could be used in the servicing, repair, and/or installation of refrigerant-containing equipment or fire suppression equipment
- Recordkeeping, reporting, and labeling
- Modifications to the Resource Conservation and Recovery Act (RCRA) to exclude certain HFCs and substitutes as hazardous waste if they are sent to an EPA-certified reclaimer

Additional Information



www.epa.gov/climate-hfcs-reduction



www.epa.gov/ozone-layer-protection

Thank you!

Stratospheric Protection Division
Office of Atmospheric Protection, Office of Air and Radiation
U.S. Environmental Protection Agency

Contacts



Speakers

- Allison Cain, U.S. EPA
Cain.Allison@epa.gov

GreenChill

- Annie Kee, U.S. EPA
kee.annie@epa.gov

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