The American Innovation and Manufacturing (AIM) Act: Technology Transitions Proposed Rule

January 19, 2023

Call-in Details 1-202-991-0477 ID: 264 403 606 795#

Today's Host

Kersey Manliclic, Doctor of Philosophy (PhD)
U.S. Environmental Protection Agency (EPA)
Stratospheric Protection Division
GreenChill Partnership
Phone: (202) 566-9981
Email: manliclic.kersey@epa.gov

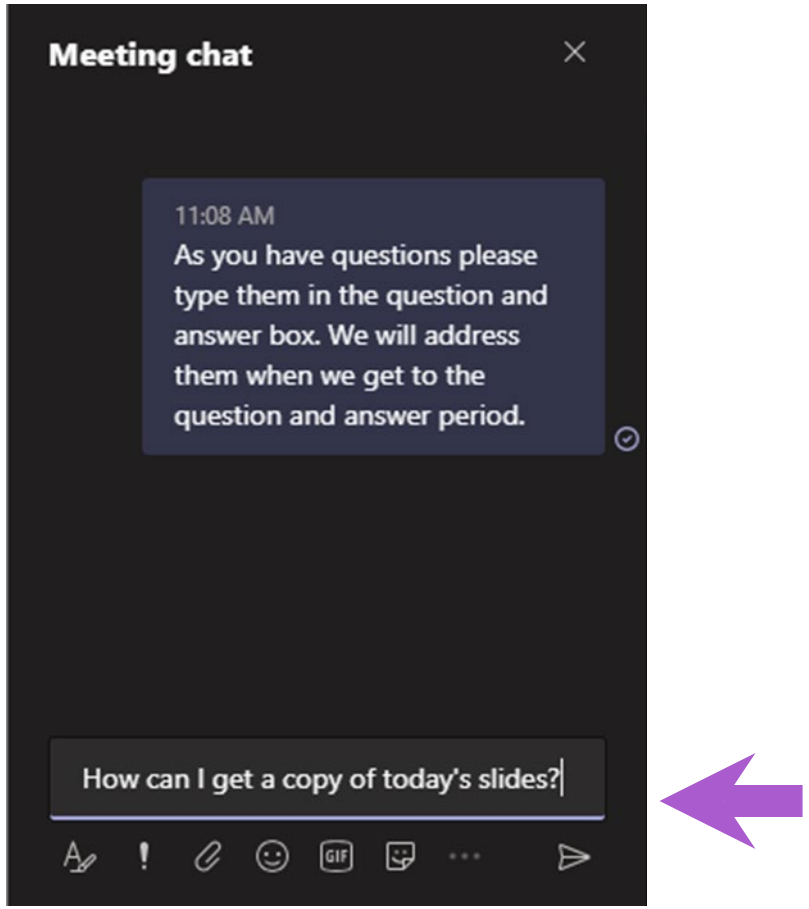
Kersey has worked in various sectors before coming to EPA, where he is the Program Manager for EPA's GreenChill Advanced Refrigeration Partnership. Most recently, he worked for 3.5 years at the California Air Resources Board implementing an incentive program for cleaner agricultural equipment and ensuring that Cap-and-Trade incentive programs benefitted disadvantaged communities. Prior to that, he worked with state agencies to plan hydrogen fueling infrastructure for fuel cell electric vehicles. He holds a Bachelor of Science (BS) in Mechanical Engineering, a BS in Materials Science & Engineering, a Masters of Science (MS), and a PhD in Environmental Engineering, all from the University of California, Irvine.

Questions

Question and Answer Session

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

EPA will not take public comments during the webinar but will respond to clarification questions about the proposed rule: https://www.federalregister.gov/documents/2022/12/15/2022-26981/phasedown-of-hydrofluorocarbons-restrictions-on-the-use-of-certain-hydrofluorocarbons-under.The 45-day public comment period for this proposed rule closes on Monday, January 30, 2022.



Call-in Details 1-202-991-0477 ID: 264 403 606 795#

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 emission 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

Welcome GreenChill's Newest Partners!

FOOD CITY

BRIARPATCH FOOD CO-OP

L&B

LUNDS & BYERLYS

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

- We are planning GreenChill's 2023 webinar series. Email GreenChill@epa.gov if you have any ideas for a webinar or would like to present.

- To be added to our webinar invitation list, email EPA-GreenChill@abtassoc.com

Celebrating 15 Years of GreenChill

2022 was the 15th anniversary of GreenChill!

- View GreenChill's 15th anniversary report: www.epa.gov/greenchill/greenchill-resources-and-reports
- Explore GreenChill's Partner accomplishment page: www.epa.gov/greenchill/partnership-accomplishments

Learn More

www.epa.gov/greenchill

GreenChill@epa.gov

@EPAair

Today's Speakers…

Allison Cain

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.

Jeremy Arling

Jeremy Arling
Lead Environmental Protection Specialist
Stratospheric Protection Division
U.S. EPA
Email: Arling.Jeremy@epa.gov

Jeremy has worked in SPD since 2007 on all manner of regulatory programs including the allocation of allowances to phase out hydrochlorofluorocarbons (HCFCs) and phase down hydrofluorocarbons (HFCs) and the revisions to the 608 refrigerant management program. He is currently working on regulations to implement the "Technology Transitions" and "Management of HFCs" subsections of the AIM Act.

Technology Transitions Briefing

Proposed Restrictions on Certain Uses of HFCs under Subsection (i) of the AIM Act

January 2023

Outline

- AIM Act Background
- Proposed Rule Overview
- Rulemaking Objectives
- Elements of the Notice of Proposed Rulemaking (NPRM)
- Next Steps
- Questions

HFc
PHASEDOWN
American Innovation & Manufacturing (AIM) Act
A U.S. Environmental Protection Agency Program

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

- 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 (CO_2)
- Absent effective regulations, HFC use and emissions are expected to continue increasing rapidly worldwide

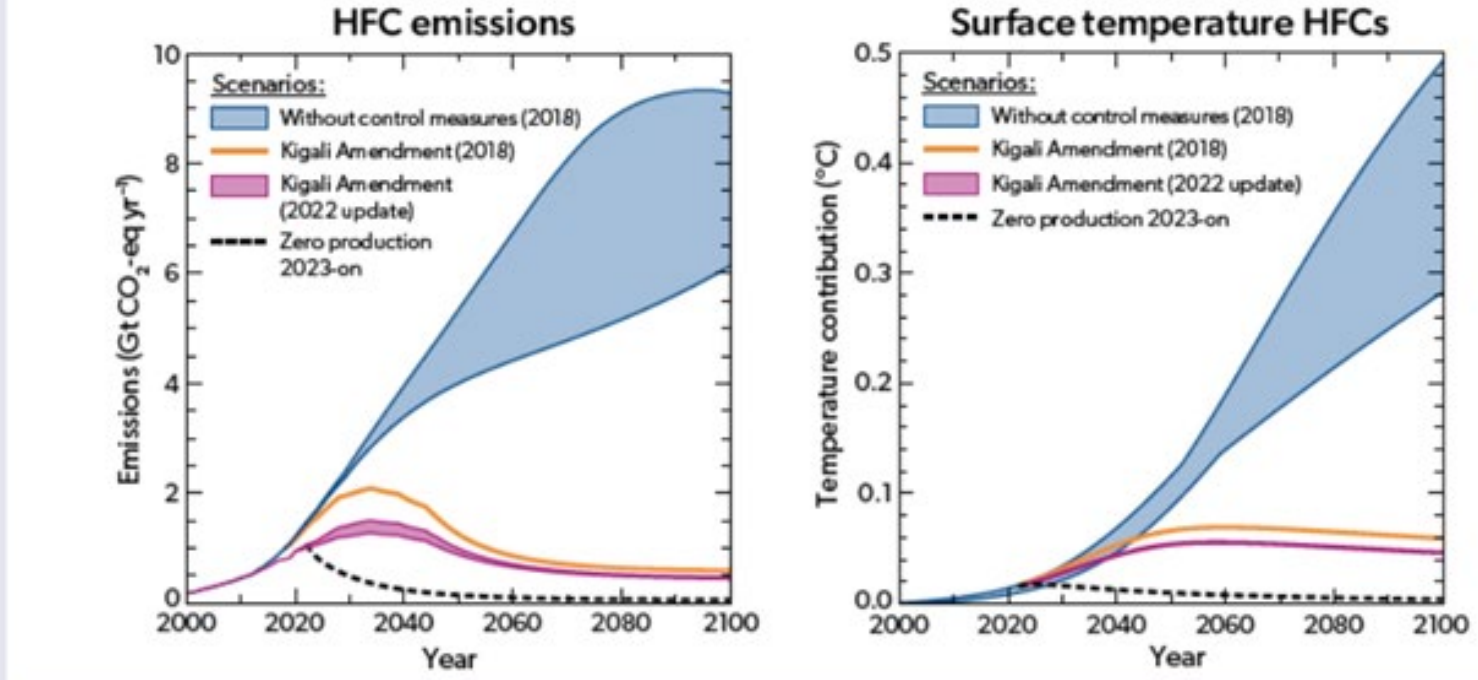


Figure ES-4. HFC emissions (left) and their impact on global average surface temperature (right). Shown is a scenario without global HFC control measures (the 'baseline' scenario from the 2018 Assessment, blue area) and the 2018 and 2022 scenarios assuming full compliance with the Kigali Amendment (orange and pink, respectively). Also shown is a scenario assuming that the global production of HFCs ceased in 2020 (black dashed line). For comparison, the total warming from all greenhouse gases is projected to be 1.4 °C to 4.4 °C by the end of the 21st century, relative to 1850–1900, following IPCC (2021) projections. The contribution from HFC-23 emissions is not included here.

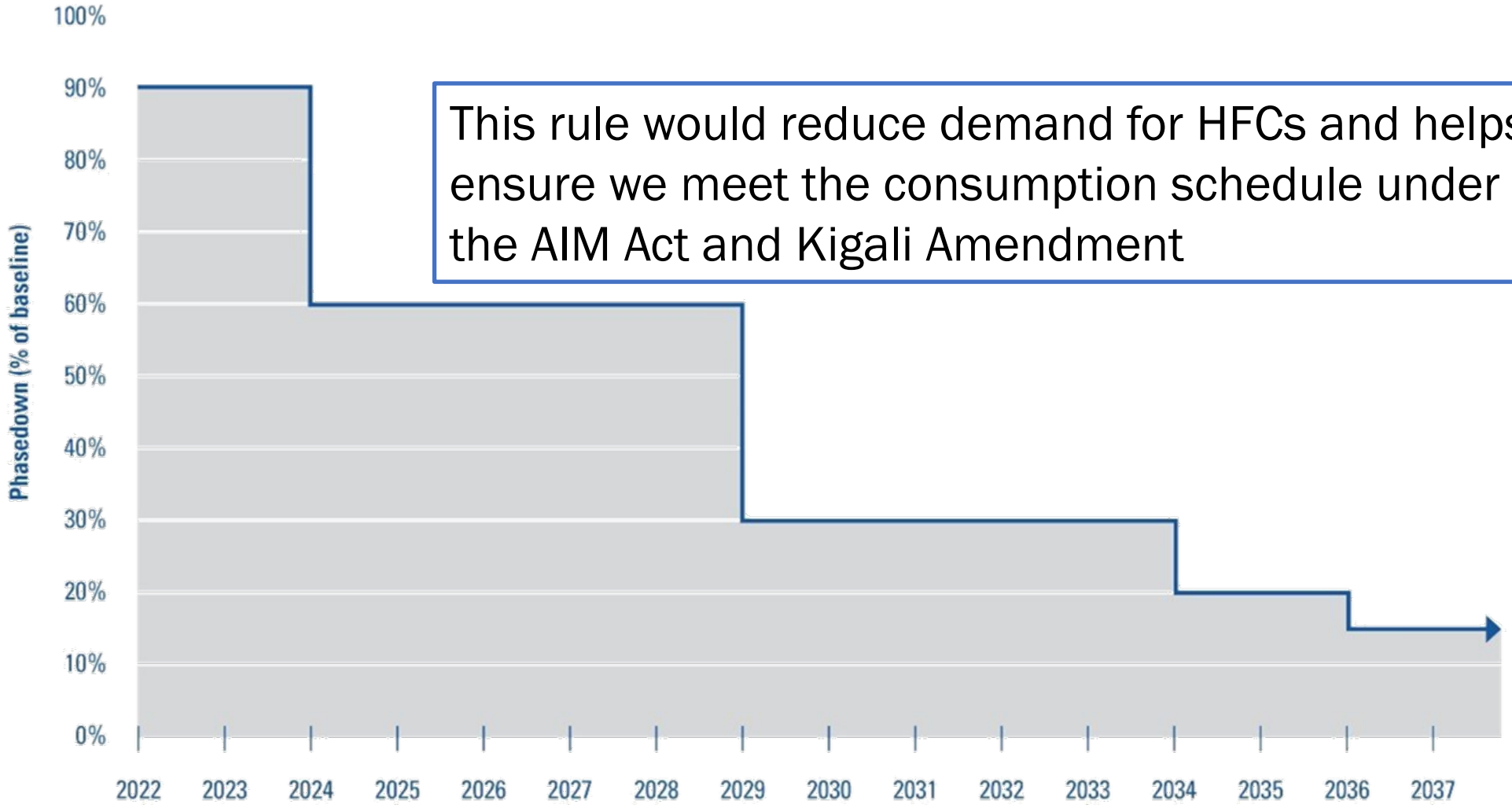
Source: World Meteorological Organization (WMO). Executive Summary. Scientific Assessment of Ozone Depletion: 2022, GAW Report No. 278, 56 pp.; WMO: Geneva, 2022.

AIM Act

- Lists 18 HFCs as regulated substances
- Phases down HFC production and consumption by 85% by 2036
- 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. Facilitate sector-based transitions to next-generation technologies through restrictions on HFCs (**focus of this rule**)
  3. Promulgate certain regulations for purposes of maximizing reclamation and minimizing releases of HFCs and their substitutes from equipment

HFC PHASEDOWN
American Innovation & Manufacturing (AIM) Act
A U.S. Environmental Protection Agency Program

HFC Phasedown Schedule



This rule would reduce demand for HFCs and helps ensure we meet the consumption schedule under the AIM Act and Kigali Amendment

HFC PHASEDOWN
American Innovation & Manufacturing (AIM) Act
A U.S. Environmental Protection Agency Program

Subsection (i) “Technology Transitions”

- Under subsection (i) of the AIM Act, EPA may restrict by rule (either fully, partially, or on a graduated schedule) the use of HFCs in a sector or subsector in which the HFC is used
- The AIM Act provides authority for EPA to act on its own or in response to petitions
- EPA received petitions to issue rules to restrict HFCs in three sectors:
  - Refrigeration, air conditioning, and heat pumps (RACHP)
  - Foams
  - Aerosols

Air Conditioners

Foam Products

Refrigerators

Aerosol Cans

Statutory Factors for Determination

As per subsection (i)(4) of the AIM Act, EPA shall, to the extent practicable, factor in:

A. the best available data;

B. the availability of substitutes for uses of the regulated substance that is the subject of the petition, taking into account:
   - 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; and

D. the remaining phase-down period for regulated substances under the final allocation rule

HFC PHASEDOWN
American Innovation & Manufacturing (AIM) Act
A U.S. Environmental Protection Agency Program

Petitions to Restrict HFC Use

- EPA received petitions to issue rules to restrict HFCs in the RACHP, foam, and aerosol sectors
- Petitioners were environmental non-governmental organizations (NGOs), industry trade associations, states, and private companies
  - EPA granted or partially granted many of the petitions in a Federal Register Notice on October 7, 2021 (86 FR 57141) and granted additional petitions on September 19, 2022 (86 FR 60158)
  - Granting petitions does not mean EPA will propose or finalize requirements identical to the petitioners' requests
- Statutory deadline for a final rule is two years after granting the petition: October 7, 2023

HFC PHASEDOWN
American Innovation & Manufacturing (AIM) Act
A U.S. Environmental Protection Agency Program

Overview of the Technology Transitions NPRM

- EPA issued a proposed rule (87 FR 76738) on December 15, 2022, to:
  - Address granted petitions
  - Establish a process for responding to future petitions
  - Restrict use of certain HFCs across 40 subsectors
  - Set requirements for labeling products containing HFCs
  - Set requirements for reporting and recordkeeping

HFC PHASEDOWN
American Innovation & Manufacturing (AIM) Act
U.S. Environmental Protection Agency Program

Elements of NPRM – Restrictions on HFCs

- The rule would prohibit the manufacture, import, export, sale, or distribution of products across 40 subsectors that use certain HFCs or HFC blends
- The rule proposes establishing GWP limits for HFCs/HFC blends by subsector
  - For example, the HFC/HFC blend contained in a household refrigerator must have a GWP lower than 150
  - Standardized thresholds for restriction by GWP at 700, 300, 150 and 0
- For four subsectors rather than set GWP thresholds, EPA proposed to prohibit use of specific HFCs or HFC blends, these subsectors are:
  - Road and marine transport refrigeration systems and two subsectors covering automatic commercial ice machines.

HFC PHASEDOWN
American Innovation & Manufacturing (AIM) Act
U.S. Environmental Protection Agency Program

Elements of NPRM – Determination of Restriction Level

- How did EPA determine the level of restrictions on HFC use in each sector and subsector?
  - The petitions provided the starting point for determining GWP restriction level
  - EPA then conducted its own evaluation using best available data
  - EPA considered the factors listed in subpart (i), including the need for a smooth transition, and the Agency's overall mission to protect human health and the environment

Elements of NPRM – Restrictions on HFCs

- Restrictions on the manufacture and import of new products would take effect January 1, 2025, for most subsectors
  - Remaining subsectors would take effect January 1, 2026, or by model year for motor vehicles
- Restrictions on the sale, distribution, and export would take effect one year later (i.e., 2026 or 2027)
  - Would provide a limited sell-through period for previously manufactured products

HFC PHASEDOWN
American Innovation & Manufacturing (AIM) Act
A U.S. Environmental Protection Agency Program

Elements of NPRM – RACHP GWP Limits

Sectors and Subsectors	Proposed GWP Limit	Compliance Date
Refrigeration, Air Conditioning, and Heat Pumps – Retail Food Refrigeration		
Stand-alone units	150	January 1, 2025
Refrigerated food processing and dispensing equipment	150	January 1, 2025
Supermarket systems with refrigerant charge capacities of 200 pounds or greater	150	January 1, 2025
Supermarket systems with refrigerant charge capacities less than 200 pounds charge	300	January 1, 2025
Supermarket systems, high temperature side of cascade system	300	January 1, 2025
Remote condensing units with refrigerant charge capacities of 200 pounds or greater	150	January 1, 2025
Remote condensing units with refrigerant charge capacities less than 200 pounds	300	January 1, 2025
Remote condensing units, high temperature side of cascade system	300	January 1, 2025

HFC PHASEDOWN
American Innovation & Manufacturing (AIM) Act
A U.S. Environmental Protection Agency Program

Elements of NPRM – RACHP GWP Limits

Sectors and Subsectors	Proposed GWP Limit	Compliance Date
Refrigeration, Air Conditioning, and Heat Pumps		
Industrial process refrigeration systems with refrigerant charge capacities of 200 pounds or greater	150	January 1, 2025
Industrial process refrigeration systems with refrigerant charge capacities less than 200 pounds	300	January 1, 2025
Industrial process refrigeration, high temperature side of cascade systems	300	January 1, 2025
Vending machines	150	January 1, 2025
Cold storage warehouse systems with refrigerant charge capacities of 200 pounds or greater	150	January 1, 2025
Cold storage warehouse systems with refrigerant charge capacities less than 200 pounds	300	January 1, 2025
Cold storage warehouse, high temperature side of cascade system	300	January 1, 2025
Ice rinks	150	January 1, 2025

HFC PHASEDOWN
American Innovation & Manufacturing (AIM) Act
A U.S. Environmental Protection Agency Program

Elements of NPRM – RACHP GWP Limits

Sectors and Subsectors	Proposed GWP Limit	Compliance Date
Refrigeration, Air Conditioning, and Heat Pumps		
Automatic commercial ice machines – self-contained with refrigerant charge capacities of 500 grams or lower	150	January 1, 2025
Transport refrigeration – intermodal containers	700	January 1, 2025
Residential refrigeration systems	150	January 1, 2025
Chillers – industrial process refrigeration	700	January 1, 2025
Chillers – comfort cooling	700	January 1, 2025
Residential and light commercial air conditioning and heat pump systems	700	January 1, 2025
Residential and light commercial air conditioning – variable refrigerant flow systems	700	January 1, 2026
Residential dehumidifiers	700	January 1, 2025

HFC PHASEDOWN
American Innovation & Manufacturing (AIM) Act
U.S. Environmental Protection Agency Program

Elements of NPRM – RACHP GWP Limits

Sectors and Subsectors	Proposed GWP Limit	Compliance Date
Refrigeration, Air Conditioning, and Heat Pumps		
Motor vehicle air conditioning – light-duty passenger vehicles	150	Model year 2025
Motor vehicle air conditioning – medium-duty passenger vehicles	150	Model year 2026
Motor vehicle air conditioning – heavy-duty pick-up trucks	150	Model year 2026
Motor vehicle air conditioning – complete heavy-duty vans	150	Model year 2026
Motor vehicle air conditioning – nonroad vehicles	150	Model year 2026

HFC PHASEDOWN
American Innovation & Manufacturing (AIM) Act
A U.S. Environmental Protection Agency Program

Elements of NPRM – Foam and Aerosols GWP Limits

Sectors and Subsectors	Proposed GWP Limit	Compliance Date
Foam blowing		
Polystyrene – extruded boardstock and billet	150	January 1, 2025
Rigid polyurethane and polyisocyanurate laminated boardstock	0	January 1, 2025
Rigid polyurethane – slabstock and other	150	January 1, 2025
Rigid polyurethane – appliance foam	150	January 1, 2025
Rigid polyurethane – commercial refrigeration and sandwich panels	150	January 1, 2025
Rigid polyurethane – marine flotation foam*	150	January 1, 2025
Rigid polyurethane – low-pressure, two-component spray foam	150	January 1, 2025
Rigid polyurethane – high-pressure two-component spray foam	150	January 1, 2025
Rigid polyurethane – one-component foam sealants	150	January 1, 2025
Flexible polyurethane	0	January 1, 2025
Integral skin polyurethane	0	January 1, 2025
Polystyrene – extruded sheet	0	January 1, 2025
Polyolefin	0	January 1, 2025
Phenolic insulation board and bunstock	150	January 1, 2025
Aerosols		
Aerosol products*	150	January 1, 2025

HFC PHASEDOWN
American Innovation & Manufacturing (AIM) Act
U.S. Environmental Protection Agency Program

Elements of NPRM – HFC Restrictions

Sectors and Subsectors	Prohibited HFCs	Compliance Date
Refrigeration, Air Conditioning, and Heat Pumps		
Automatic commercial ice machines – self-contained with refrigerant charge capacities more than 500 grams	R-404A, R-507, R-507A, R-428A, R-422C, R-434A, R-421B, R-408A, R-422A, R-407B, R-402A, R-422D, R-421A, R-125/R-290/R-134a/R-600a (55/1/42.5/1.5), R-422B, R-424A, R-402B, GHG-X5, R-417A, R-438A, R-410B, R-407A, R-410A, R-442A, R-417C, R-407F, R-437A, R-407C, RS-24 (2004 formulation), HFC-134a	January 1, 2025
Automatic commercial ice machines – remote	R-404A, R-507, R-507A, R-428A, R-422C, R-434A, R-421B, R-408A, R-422A, R-407B, R-402A, R-422D, R-421A, R-125/R-290/R-134a/R-600a (55/1/42.5/1.5), R-422B, R-424A, R-402B, GHG-X5, R-417A, R-438A, R-410B	January 1, 2025
Transport refrigeration – road systems	R-404A, R-507, R-507A, R-428A, R-422C, R-434A, R-421B, R-408A, R-422A, R-407B, R-402A, R-422D, R-421A, R-125/R-290/R-134a/R-600a (55/1/42.5/1.5), R-422B, R-424A, R-402B, GHG-X5, R-417A, R-438A, R-410B	January 1, 2025
Transport refrigeration – marine systems	R-404A, R-507, R-507A, R-428A, R-422C, R-434A, R-421B, R-408A, R-422A, R-407B, R-402A, R-422D, R-421A, R-125/R-290/R-134a/R-600a (55/1/42.5/1.5), R-422B, R-424A, R-402B, GHG-X5, R-417A, R-438A, R-410B	January 1, 2025

HFC PHASEDOWN
American Innovation & Manufacturing (AIM) Act
U.S. Environmental Protection Agency Program

Elements of NPRM – HFC Restrictions

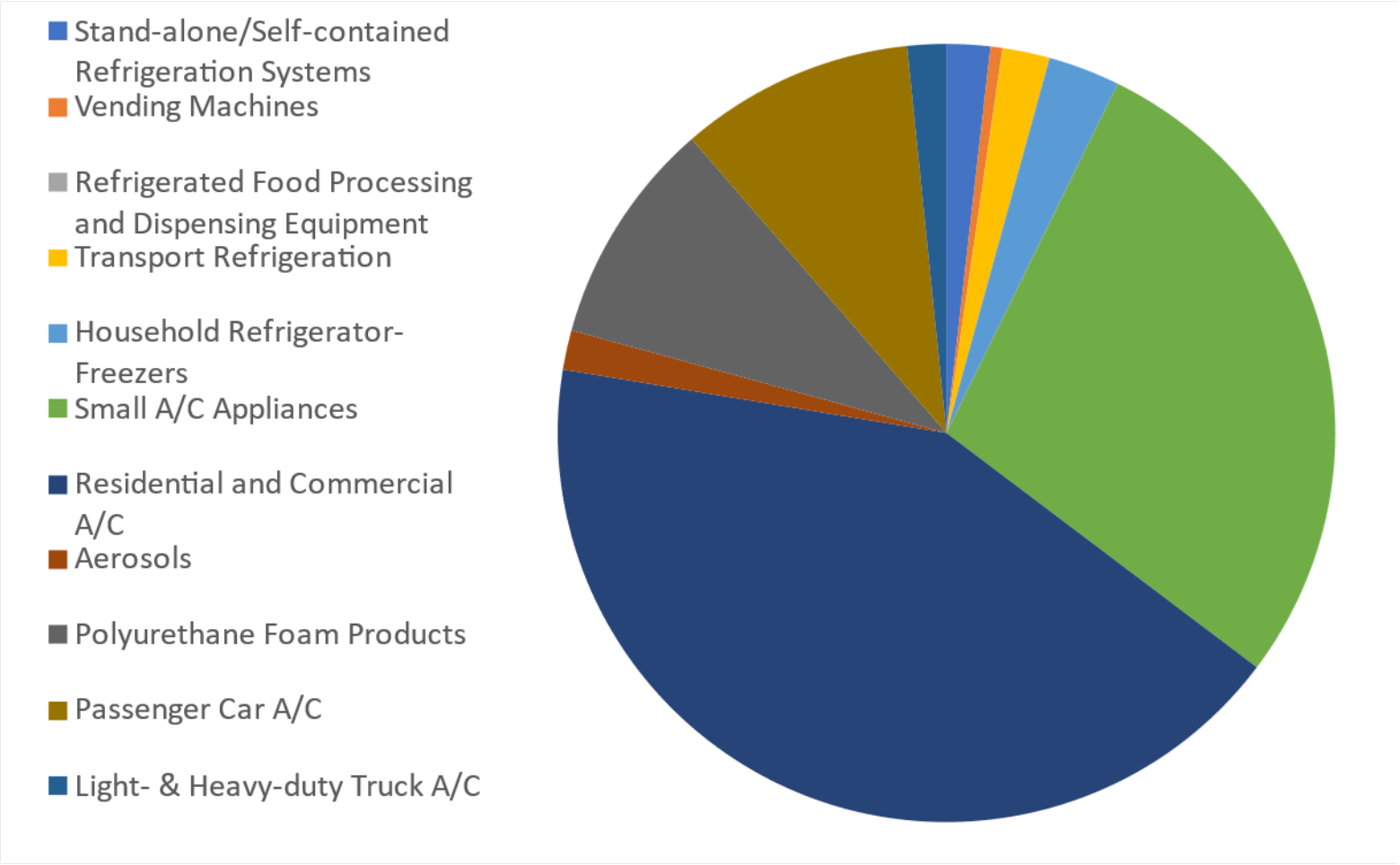
- The proposed restrictions would not apply to any product that receives an application-specific HFC allowance under subsection (e)(4)(B) of the AIM Act. As such, this proposed action does not restrict use of HFCs used in the following:
  - As a propellant in metered dose inhalers
  - In the manufacture of defense sprays
  - In the manufacture of structural composite preformed polyurethane foam for marine use and trailer use
  - Etching of semiconductor material or wafers and the cleaning of chemical vapor deposition chambers within the semiconductor manufacturing sector
  - Mission-critical military end uses
  - Onboard aerospace fire suppression

HFC PHASEDOWN
American Innovation & Manufacturing (AIM) Act
U.S. Environmental Protection Agency Program

Elements of NPRM – Imports of Products Containing HFCs

- The proposed prohibitions would apply to domestic manufacture and import of products equally
- U.S. imports of HFCs in equipment was ~42 million metric tons of carbon dioxide equivalent ($MMTCO_2e$) in 2021

HFCs (GWP-weighted) in Imported Products in 2021



A/C: Air conditioning

Elements of the NPRM – Labeling and Reporting

- Labeling, reporting, and recordkeeping required for products using HFCs in affected sectors and subsectors
- **Labeling:** To ease identification of products using HFCs/HFC blends
  - Labels would include name of the HFC/HFC blend, GWP, and manufacture date of the product
  - Existing labels (e.g., Underwriters Laboratories (UL) labels) could be used to address some of the required label elements
- **Reporting:** To assist with compliance and oversight, allow EPA to monitor HFC demand, and provide aggregated data on HFC use in products to the public
  - Proposed quarterly electronic reporting for manufacturers and importers of aerosol, foam and RACHP products using HFCs
  - Reporters would be required to keep associated records for 3 years

HFC PHASEDOWN
American Innovation & Manufacturing (AIM) Act
A U.S. Environmental Protection Agency Program

Benefits of the NPRM

- EPA estimates that the proposed rule, if finalized as proposed, would result in significant greenhouse gas (GHG) emissions reductions benefits while providing savings to American consumers and industry
- Estimated cumulative GHG emissions reductions range from 134 to 903 $MMTCO_2e$ from 2025 through 2050
  - These reductions would result in up to $50 billion in climate benefits
- The proposed rule also would save U.S. industry and consumers up to $8 billion from 2025 through 2050
- These benefits are in addition to those already accounted for in the HFC phasedown

HFC PHASEDOWN
American Innovation & Manufacturing (AIM) Act
A U.S. Environmental Protection Agency Program

Next Steps

- Technology Transitions Rule was published in the Federal Register on December 15th, 2022
  - 45-day public comment period, ends **January 30th, 2023**
  - EPA hosted a public hearing on the proposed rule on December 30th, 2022
  - Docket ID: EPA-HQ-OAR-2021-0643

- EPA intends to finalize Technology Transitions rule no later than October 7, 2023, consistent with the statutory deadline

HFC PHASEDOWN
American Innovation & Manufacturing (AIM) Act
A U.S. Environmental Protection Agency Program

Helpful Resources

- **Technology Transitions Proposed Rule Website:**
  - www.epa.gov/climate-hfcs-reduction/technology-transitions
  - Includes link to rule, fact sheet, regulatory impact analysis, and press release
- **Federal Register:**
  - (87 FR 76738)
- **Docket:**
  - https://www.regulations.gov/docket/EPA-HQ-OAR-2021-0643

HFC PHASEDOWN
American Innovation & Manufacturing (AIM) Act
A U.S. Environmental Protection Agency Program

Contacts

AIM Act Contacts

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

- The 45-day public comment period for this proposed rule closes Monday, January 30, 2022. Review the proposed rule for further information on how to comment.

GreenChill Contacts

- Kersey Manliclic, U.S. EPA
  Manliclic.Kersey@epa.gov

Join our webinar invitation list or request today's slides: EPA-GreenChill@abtassoc.com

Access past webinar slides and recordings: www.epa.gov/greenchill/events-and-webinars