



# **American Innovation and Manufacturing (AIM) Act Emissions Reduction and Reclamation (ER&R) Program Final Rule**

October 09, 2024

# Today's Host



## Annie Kee

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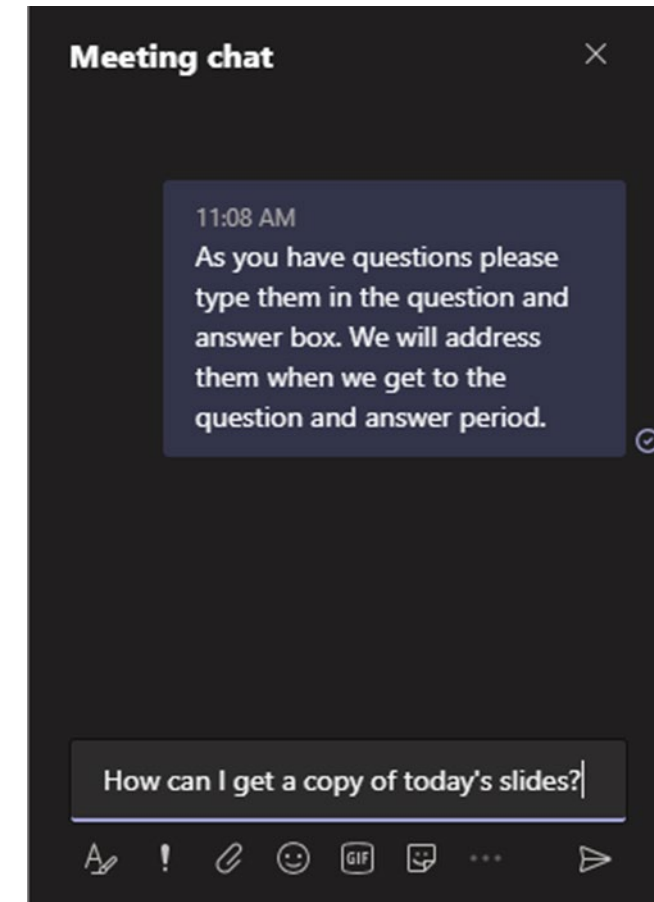
**Annie** is an Environmental Protection Specialist in the Stratospheric Protection Division (SPD) in EPA's Office of Atmospheric Protection, where she works on rulemakings under the American Innovation and Manufacturing (AIM) Act and partnership programs. Prior to SPD, she also worked on EPA's SmartWay 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
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[epa.gov/greenchill/about-greenchill-corporate-emissions-reduction-program](https://epa.gov/greenchill/about-greenchill-corporate-emissions-reduction-program)

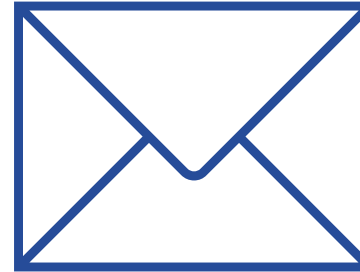
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**Today's Speaker...**

# Christian Wisniewski



## Christian Wisniewski

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**Christian** is an Environmental Protection Specialist in the Stratospheric Protection Division (SPD) in EPA's Office of Atmospheric Protection, where he works on rulemakings under the American Innovation and Manufacturing (AIM) Act and was the lead author on the Emissions Reduction and Reclamation Rule. Prior to EPA, Christian worked in the State of Delaware's Department of Natural Resources and Environmental Control, where he worked on the state's greenhouse gas inventory and Climate Action Plan and helped to establish the state's hydrofluorocarbon (HFC) regulation.



**PHASEDOWN OF HYDROFLUOROCARBONS: MANAGEMENT OF CERTAIN  
HYDROFLUOROCARBONS AND SUBSTITUTES UNDER THE AIM ACT**

**EMISSIONS REDUCTION AND RECLAMATION PROGRAM**

**Christian Wisniewski  
Emissions Reduction Branch, Stratospheric Protection Division  
U.S. Environmental Protection Agency**

GreenChill Program Webinar

October 9, 2024

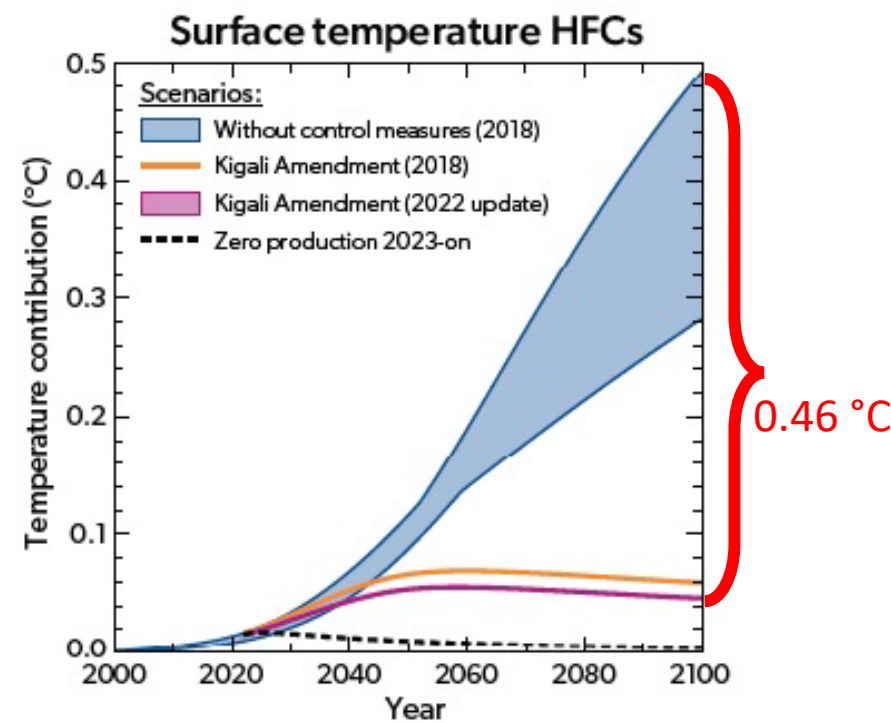
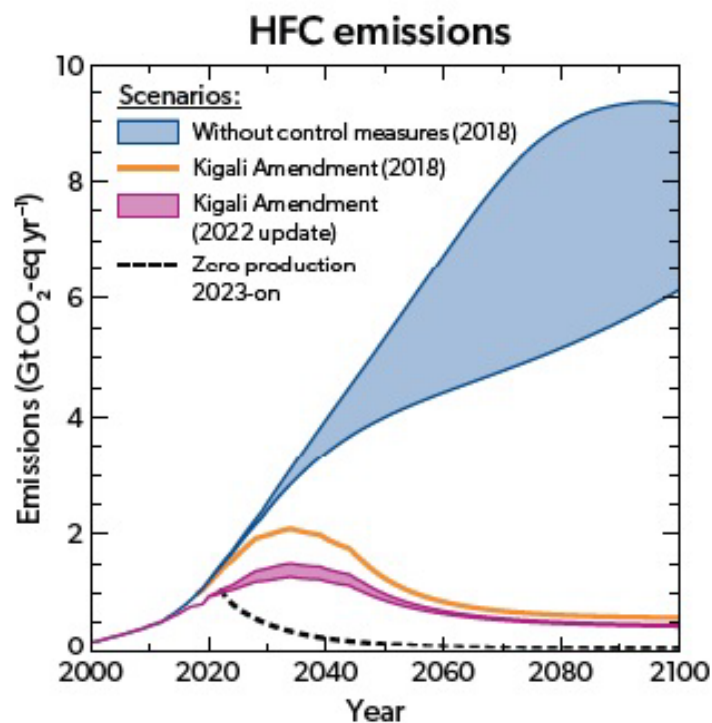
# Outline

- Global Hydrofluorocarbon (HFC) Phasedown and AIM Act
- Emissions Reduction and Reclamation Program (ER&R)
- Resources
- Question & Answer (Q&A)



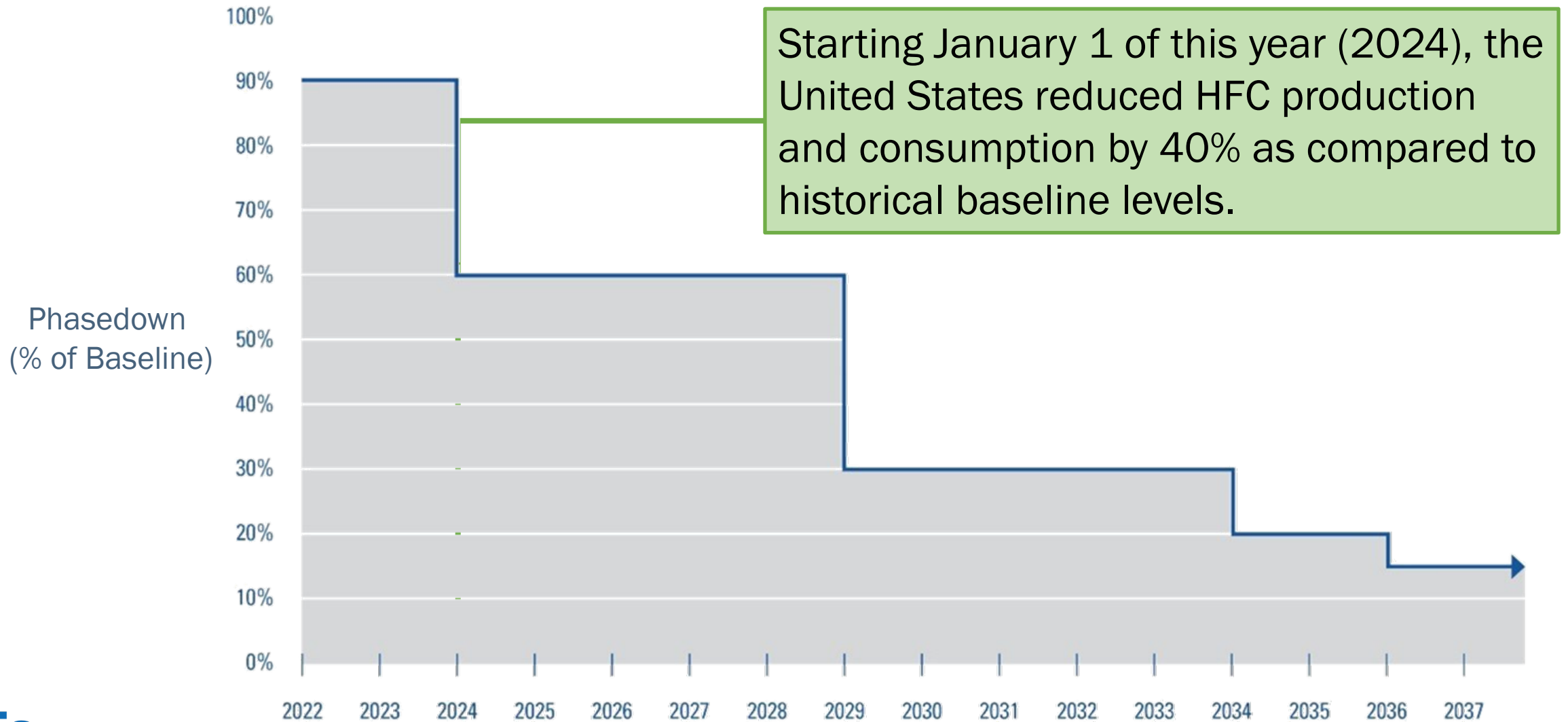
# A global HFC phasedown is expected to avoid up to 0.5 °C of global warming by 2100

- HFCs are used 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<sub>2</sub>)
- Absent effective regulations, HFC use and emissions are expected to continue increasing rapidly worldwide



WMO Scientific Assessment of Ozone Depletion: 2022, GAW Report No. 278, Figure ES-4

# HFC Phasedown Schedule



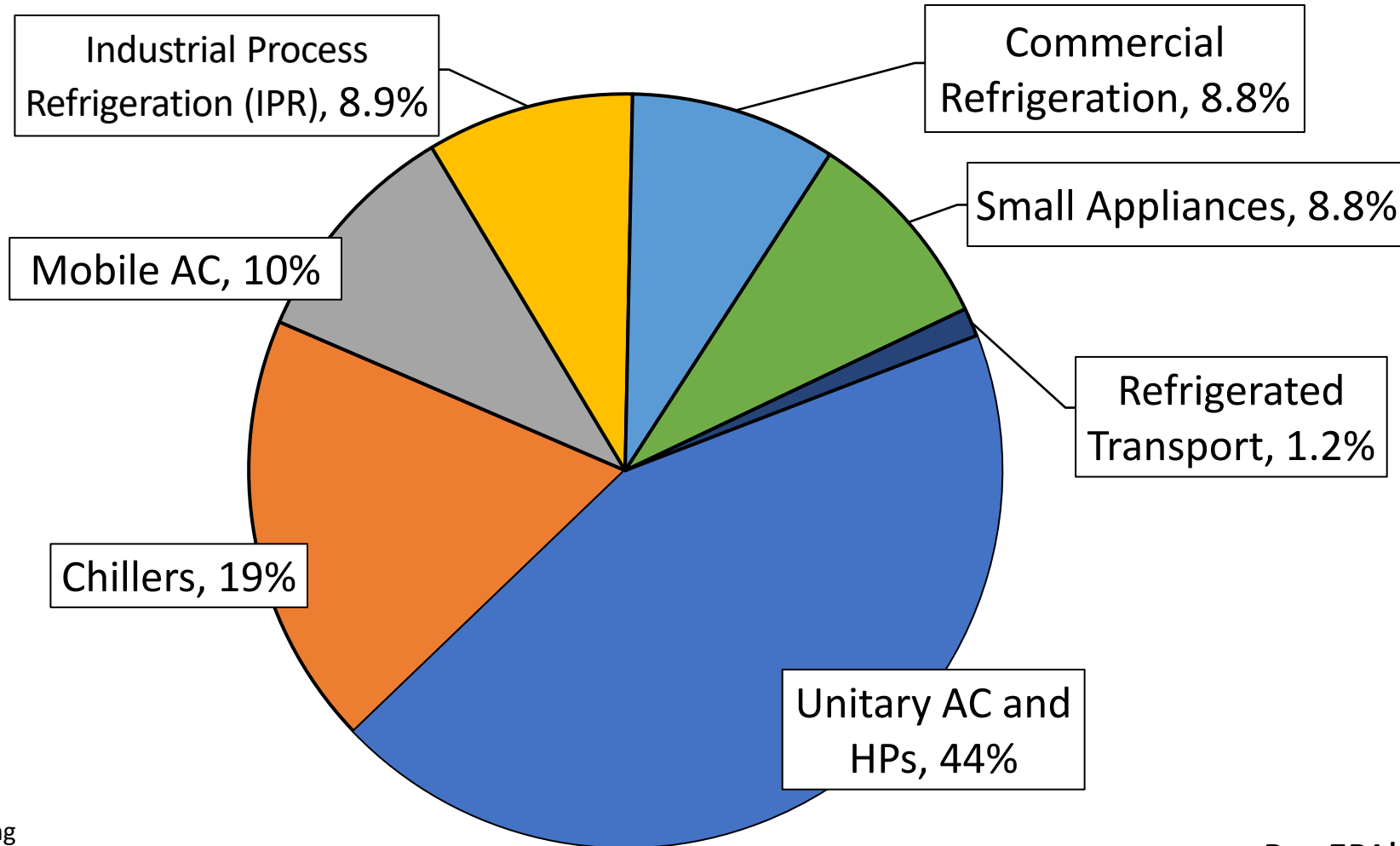
# Which are the most common HFCs and HFC blends?

- EPA has recently updated the HFC Data Hub with published data on 2023 U.S. production and calculated consumption
- The Data Hub provides tables and data visualizations and promotes additional transparency

Chemical	AIM Act Consumption (MTCO <sub>2</sub> e) - 2023
HFC-125	141,040,637
HFC-134a	64,221,610
HFC-32	25,575,228
HFC-143a	8,037,684
HFC-152a	4,525,737
HFC-245fa	4,162,791
HFC-236fa	1,553,639
HFC-23	1,298,915
HFC-227ea	1,156,190
Other	1,380,543

# Where are HFC and HFC blends used?

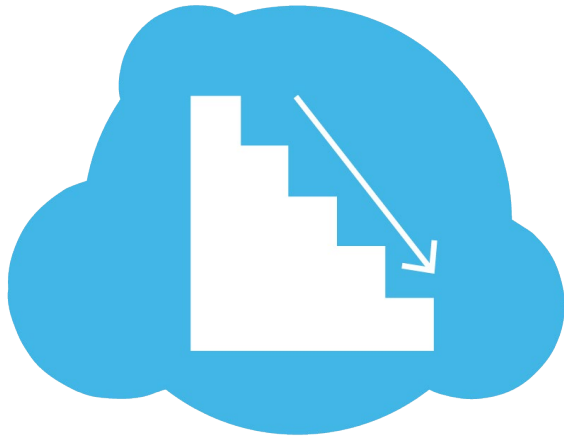
Estimated HFC Refrigerants (in metric tons) in Installed Equipment Expected in 2025





# The American Innovation & Manufacturing (AIM) Act

The AIM Act authorizes EPA to address HFCs in **three main ways**:



**Phase down** HFC production and consumption through an allowance allocation and trading program

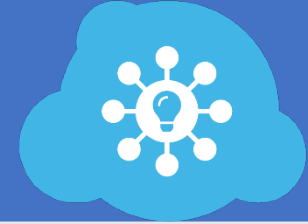
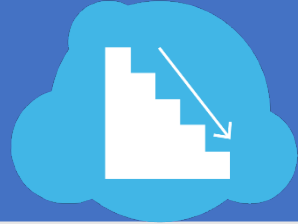


**Manage** use and reuse of HFCs by maximizing reclamation and minimizing releases from equipment



**Transition** sectors to next-generation technologies through restrictions on use of HFCs

# Regulatory Highlights



## Subsection (e) – Phasedown of Production and Consumption of HFCs

## Subsection (h) – Management of Regulated Substances

## Subsection (i) – Technology Transitions

HFC Allocation Framework Rule	10/5/2021 ( <a href="#">86 Final Rule (FR) 55116</a> )	Emissions Reduction and Reclamation Final Rule	Signed: 9/20/2024 (pending Federal Register publication)	Technology Transitions Rule	10/24/2023 ( <a href="#">88 FR 73098</a> )
Allocation Rule for 2024 and Later Years	7/20/2023 ( <a href="#">88 FR 46836</a> )			Residential & Light Commercial AC & Heat Pump Subsector Interim Final Rule	12/26/2023 ( <a href="#">88 FR 88825</a> )
Application-Specific Allowance Review Proposed Rule	9/16/2024 ( <a href="#">89 FR 75898</a> )			Variable Refrigerant Flow Proposed Rule	6/26/2024 ( <a href="#">89 FR 53373</a> )

# Emissions Reduction and Reclamation Program

# Overview of Subsection (h) – Management of Regulated Substances

- Subsection (h) of the AIM Act provides EPA authority to promulgate certain regulations for the purposes of maximizing reclaiming and minimizing releases of HFCs from equipment and ensuring the safety of technicians and consumers
- EPA can also consider opportunities for increasing the reclaiming of regulated substances used as refrigerants



# Emissions Reduction and Reclamation Rule

- Signed on September 20, 2024
- Establishes the [Emissions Reduction and Reclamation \(ER&R\) Program](#) for the management of certain HFCs and their substitutes
- Establishes implementing regulations to control, where appropriate, practices, processes, or activities regarding the servicing, repair, disposal, or installation of equipment that involves certain HFCs and their substitutes
- From 2026-2050, the rule is estimated to prevent 120 million metric tons of CO<sub>2</sub> equivalent (MMTCO<sub>2</sub>e) in HFC emissions beyond other AIM Act rules
  - For informational purposes, the net benefits of the rule have been estimated to be at least \$6.9 billion



# Emissions Reduction and Reclamation Rule – Overview

- Leak repair requirements for certain appliances using HFCs and certain substitute refrigerants
- Installation and use of automatic leak detection (ALD) systems
- Standard for reclaimed HFC refrigerants
- Reclaimed HFCs for servicing and/or repair in certain refrigeration, air conditioning, and heat pump (RACHP) subsectors
- Recycled HFC fire suppressants for initial installation and servicing and/or repair of fire suppression equipment
- Provisions for equipment in the fire suppression sector, including technician training
- Removal of HFCs from disposable cylinders prior to discarding them
- Associated recordkeeping, reporting, and labeling requirements

EPA is also finalizing alternative recycling criteria for ignitable used refrigerants, including some HFCs and their substitutes, under the authority of the Resource Conservation and Recovery Act

# Leak Repair

- Compliance date beginning on January 1, 2026
- Suite of leak repair provisions apply to refrigerant-containing appliances that contain 15 pounds or more of a refrigerant that contains an HFC or a substitute for an HFC with a GWP greater than 53
- Leak repair provisions do not apply to refrigerant-containing appliances used in residential and light commercial air-conditioning

Applicable Leak Rates	
Industrial Process Refrigeration	30%
Commercial Refrigeration	20%
Comfort Cooling and other appliances	10%

# Automatic Leak Detection

- Timing of requirements is dependent on new vs. existing appliances
  - Beginning January 1, 2026, ALDs are required for new appliances either during installation or within 30 days of installation
  - Beginning January 1, 2027, ALDs are required for existing appliances installed on or after January 1, 2017, and before January 1, 2026
- Installation and use of ALD systems on IPR and commercial refrigeration appliances with 1,500 pounds or more of a refrigerant that contains an HFC or a substitute for an HFC with a GWP above 53
- Provisions allow for either a direct or indirect ALD system, such that they meet the applicable requirements (e.g., calibration, detection levels)
- Recordkeeping requirements



# Reclamation

- Refrigerants containing HFCs recovered from stationary refrigerant-containing equipment may not be sold/transferred to a new owner unless
  - The recovered HFC is first reclaimed, or
  - Sold or transferred for the purpose of being reclaimed or destroyed
- Beginning January 1, 2026, refrigerant being sold, identified, or reported as reclaimed may not contain more than 15% virgin HFCs, by weight
  - The limit does not apply to virgin substitutes for HFCs (e.g., hydrofluoroolefins, CO<sub>2</sub>, etc.) that may be neat or in a refrigerant blend
- Containers of reclaimed HFC refrigerants must be labeled to certify the contents do not exceed the limit on virgin HFCs
  - Associated records must be kept for three years

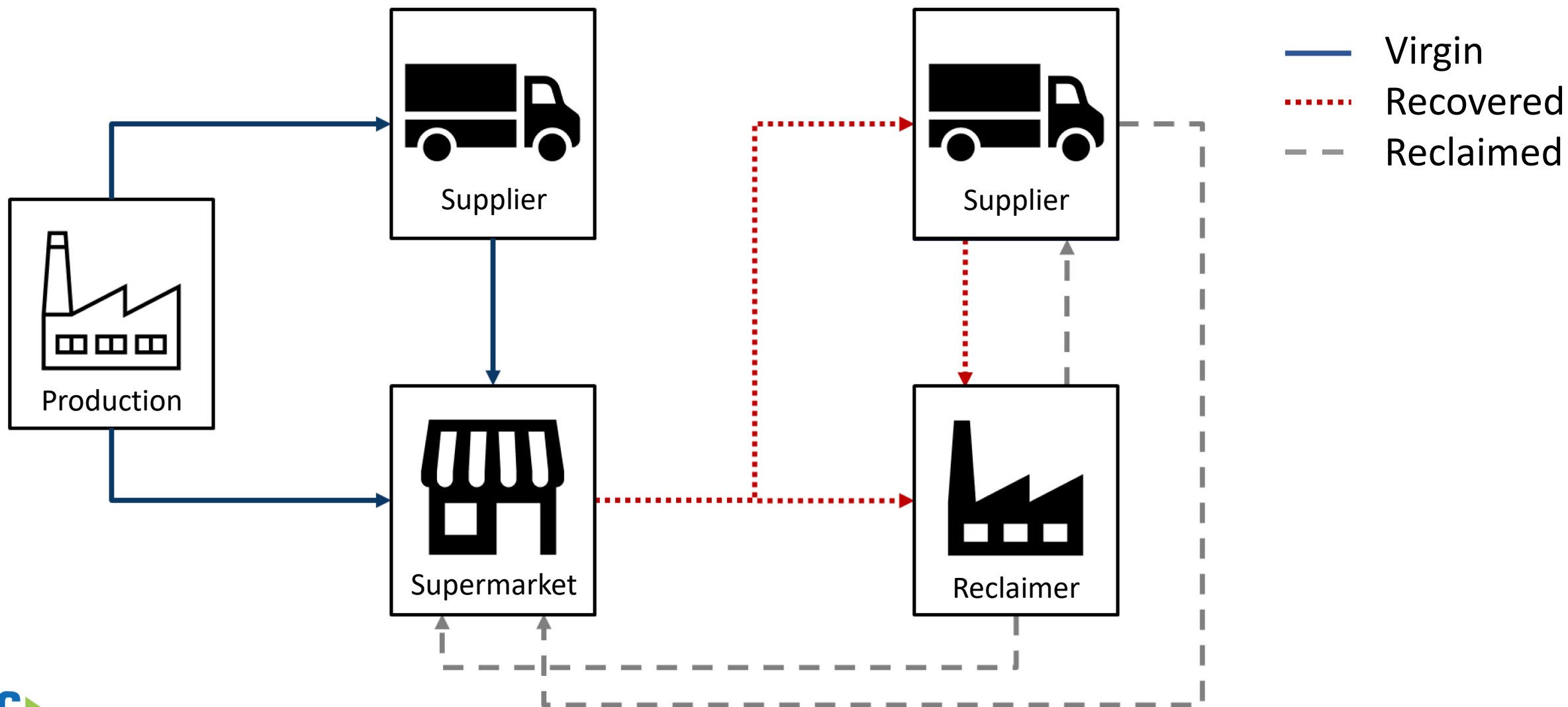
# Servicing and/or Repair with Reclaimed HFCs

- Beginning January 1, 2029, reclaimed HFCs must be used for servicing and/or repair of certain equipment in these subsectors:
  - Supermarket systems
  - Refrigerated transport
  - Automatic commercial ice makers
- Two-time reporting requirement for reclaimers, distributors, and wholesalers of reclaimed refrigerants that contain HFCs to report on the amounts and types of reclaimed HFCs sold for servicing and/or repair of equipment in these subsectors
  - Due February 14, 2027, covering calendar year 2026
  - Due February 14, 2028, covering calendar year 2027



Refer to 40 CFR 84.112 for complete details

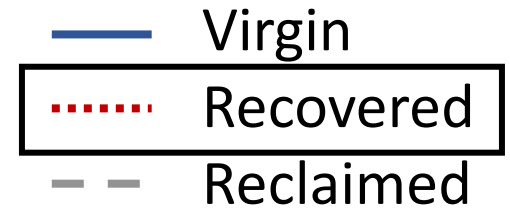
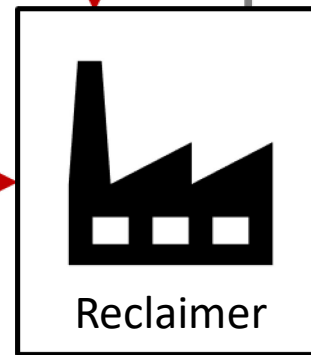
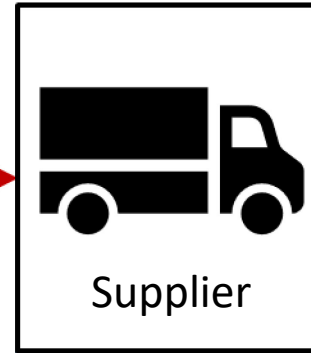
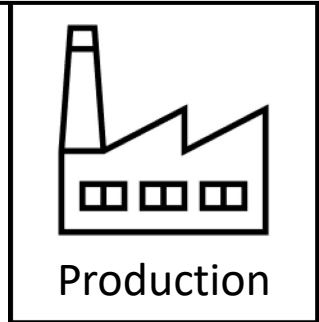
# Reclamation Provisions (example)



Refer to 40 CFR 84.104 and 40 CFR 84.112 for complete details

# Reclamation Provisions (example)

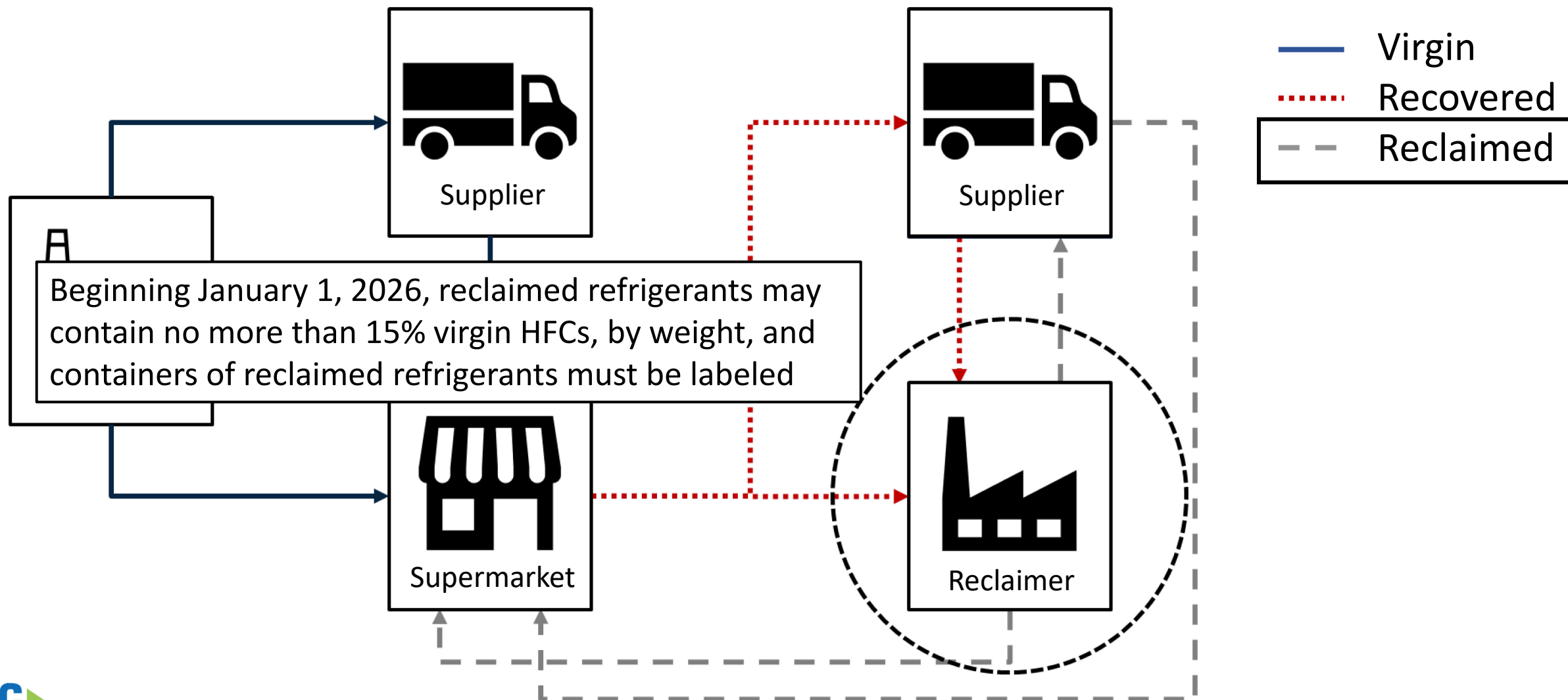
Refrigerant containing HFCs recovered from stationary refrigerant-containing equipment may not be sold/transferred to a new owner unless first reclaimed or it is sold/transferred for the sole purpose of being reclaimed or destroyed



Note: In this rule, EPA did not implement this provision for refrigerants in motor vehicle air conditioning (MVAC)

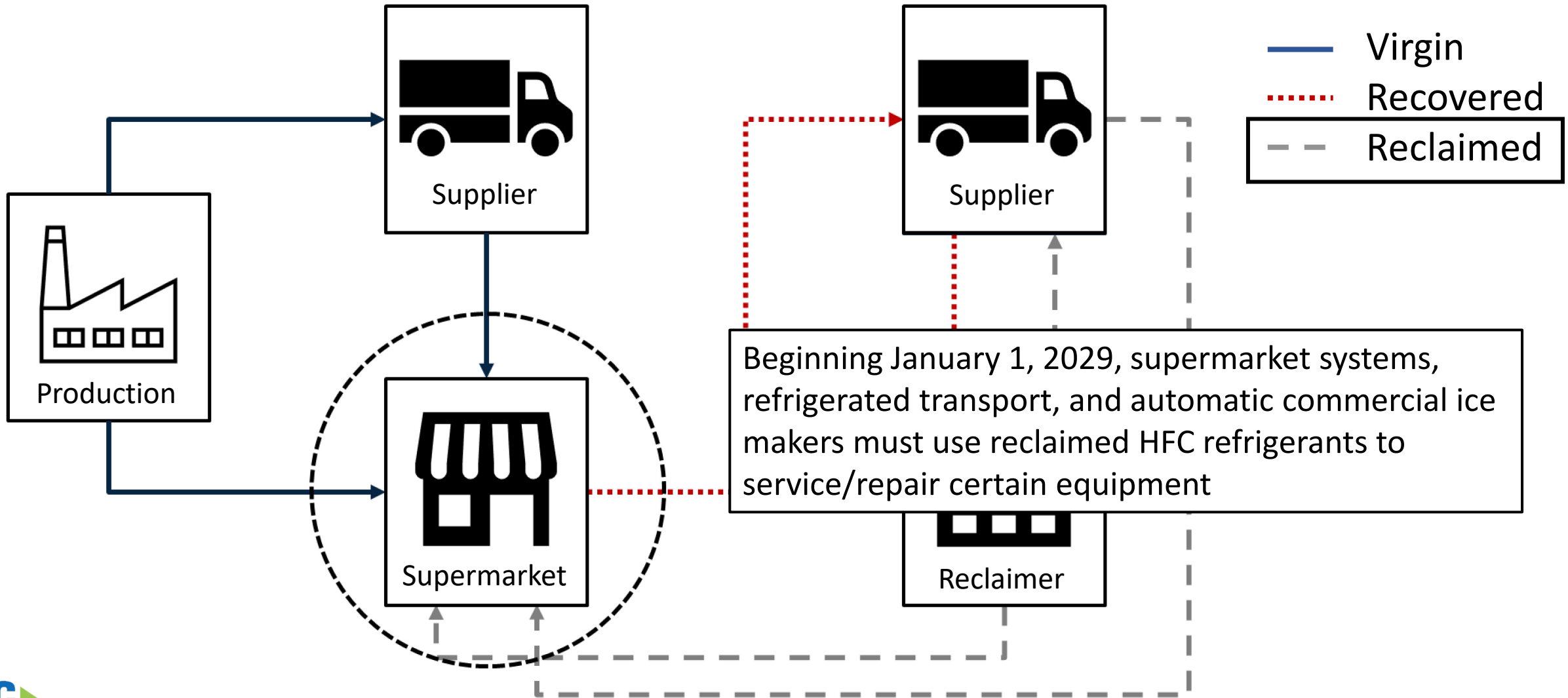
Refer to 40 CFR 84.104 and 40 CFR 84.112 for complete details

# Reclamation Provisions (example)



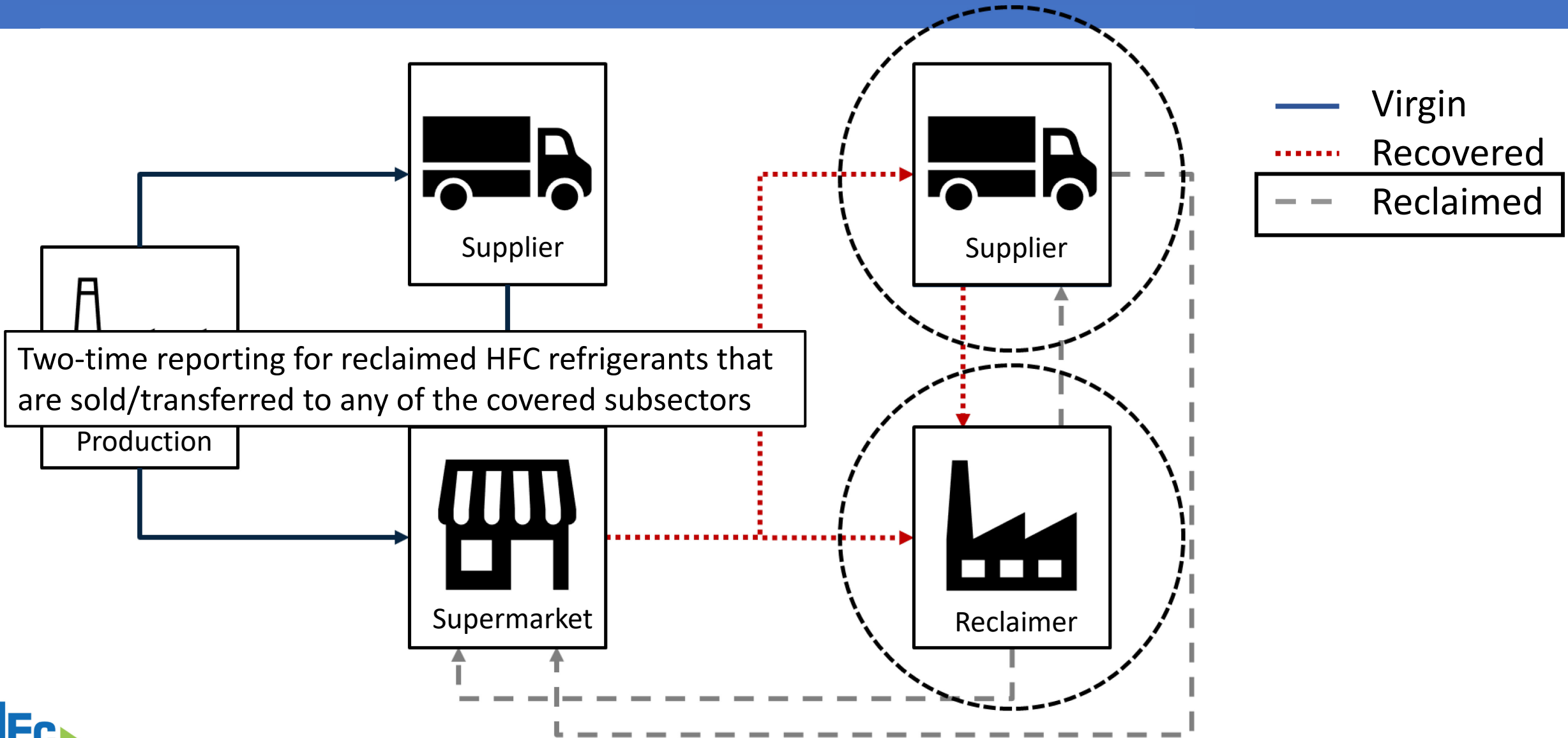
Refer to 40 CFR 84.104 and 40 CFR 84.112 for complete details

# Reclamation Provisions (example)



Refer to 40 CFR 84.104 and 40 CFR 84.112 for complete details

# Reclamation Provisions (reporting)



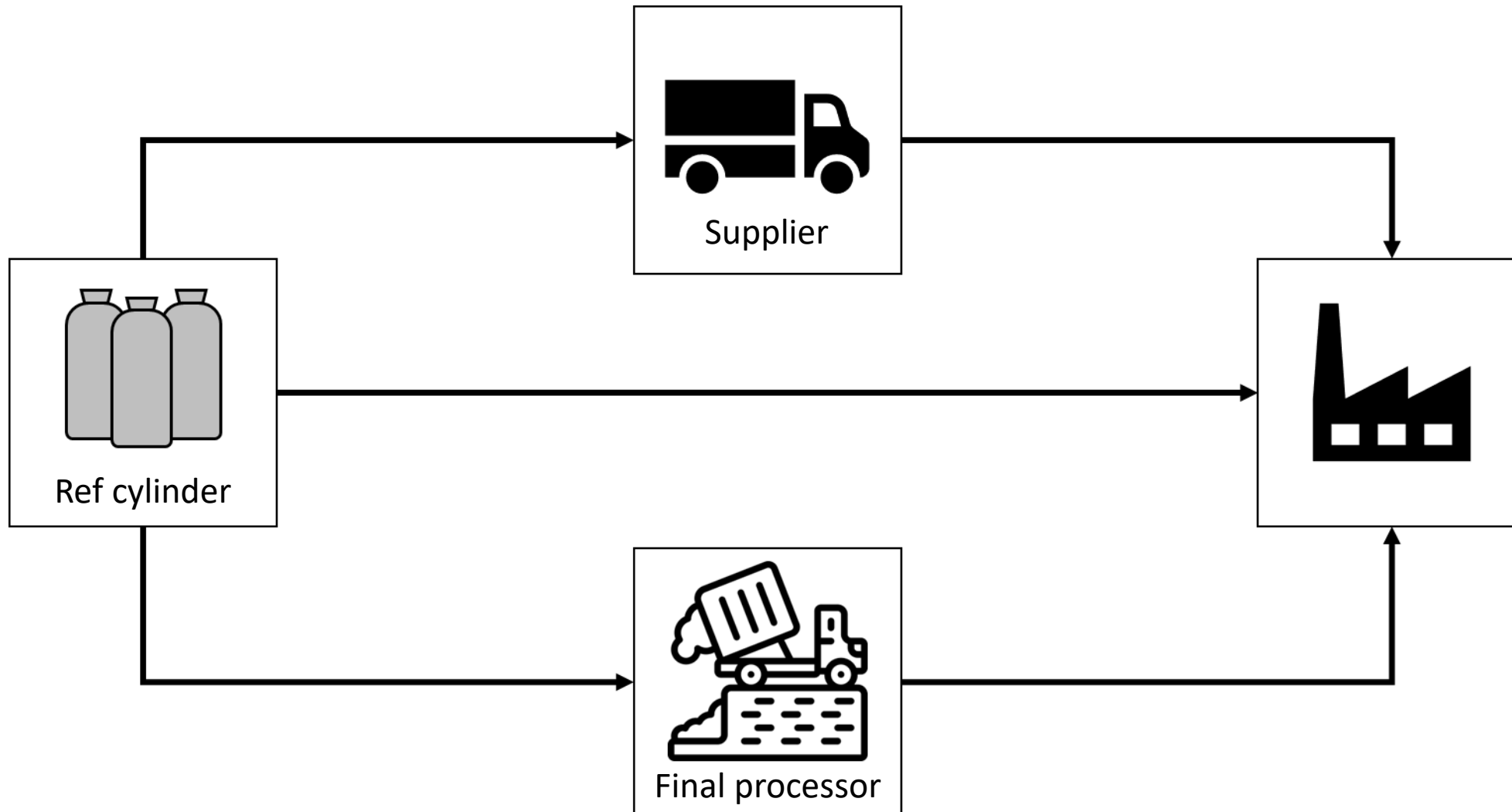
Refer to 40 CFR 84.104 and 40 CFR 84.112 for complete details

# Disposable Cylinders

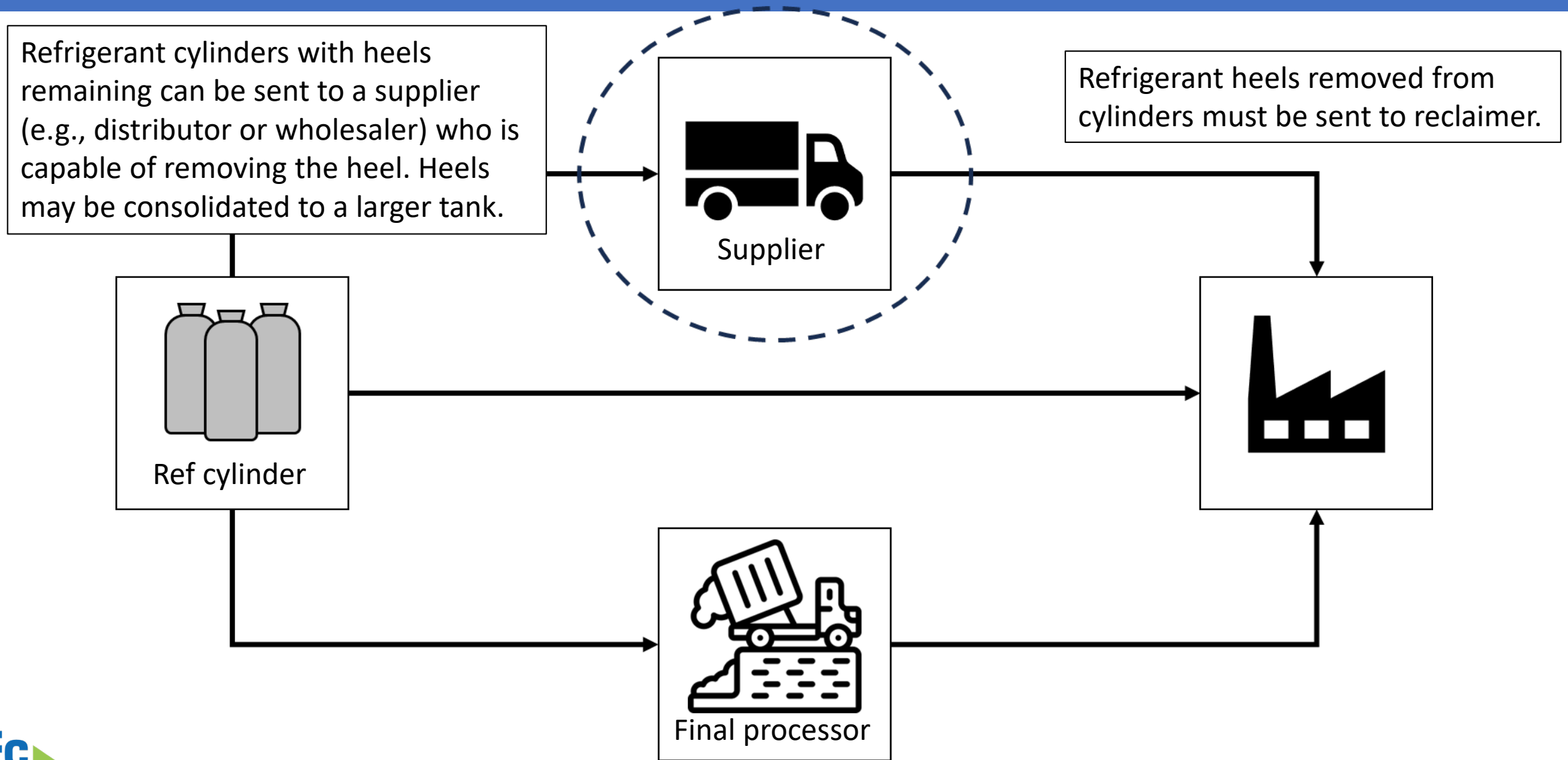
- Beginning January 1, 2028, disposable cylinders of HFCs must be sent to a certified reclaimer, a fire suppressant recycler, a final processor, or a refrigerant supplier for removal of remaining HFC refrigerant before discarding
- The removed heel must be sent to an EPA-certified reclaimer or a fire suppressant recycler
- An alternate compliance method is also available to allow certified technicians to remove heels and evacuate disposable cylinders to a specified level of vacuum and then discard the cylinder to a final processor with certification that the cylinder was properly evacuated
  - The certification statement must be retained as a record



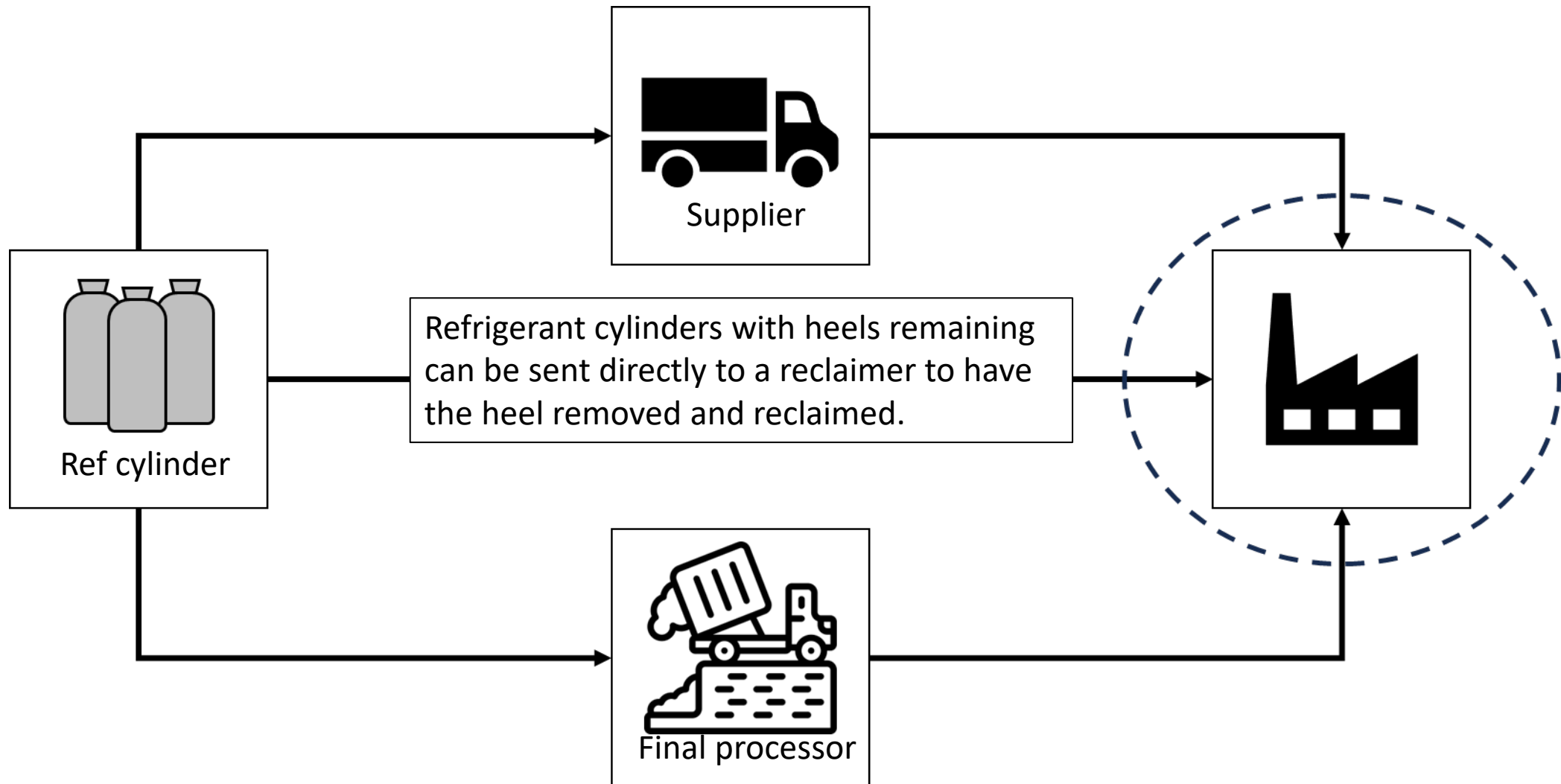
# Disposable Cylinders (example)



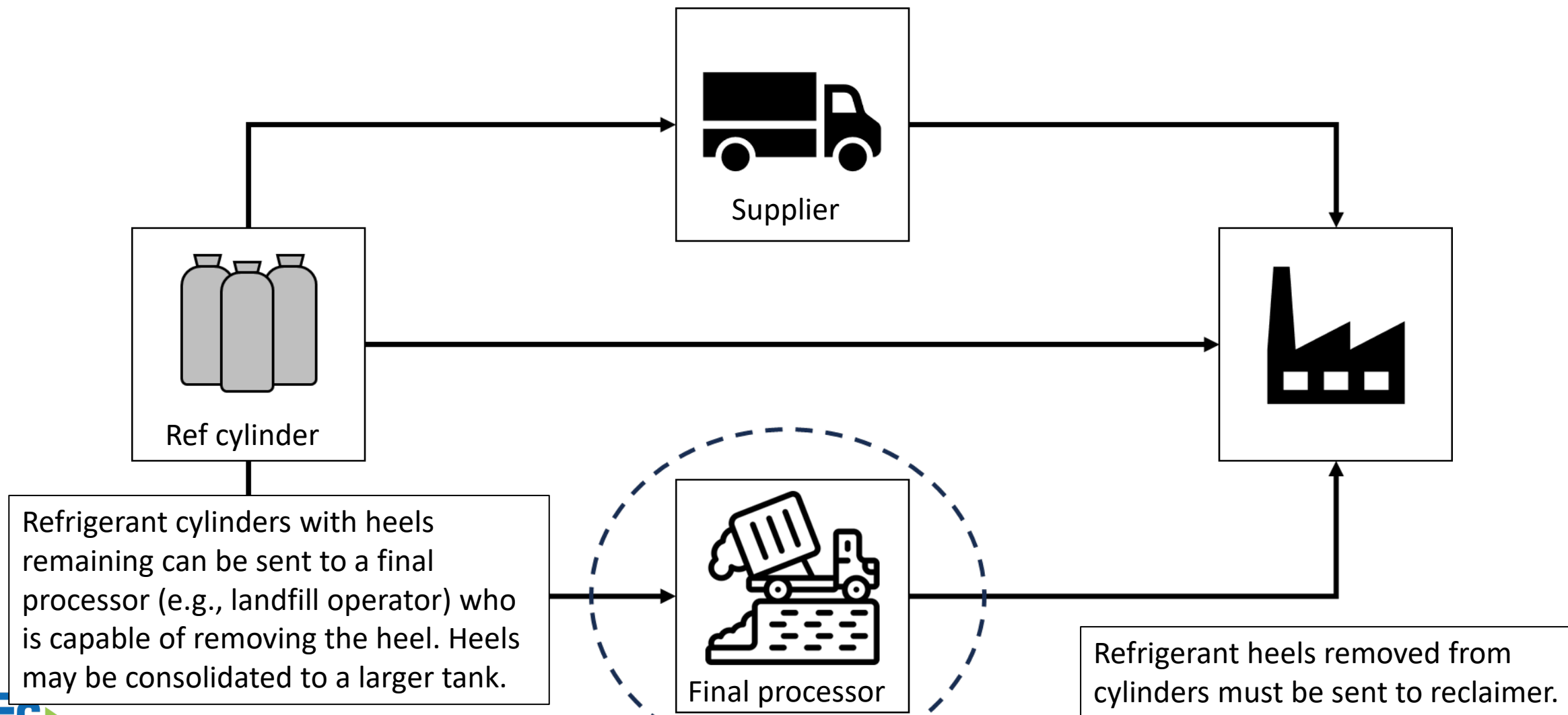
# Disposable Cylinders (compliance options example)



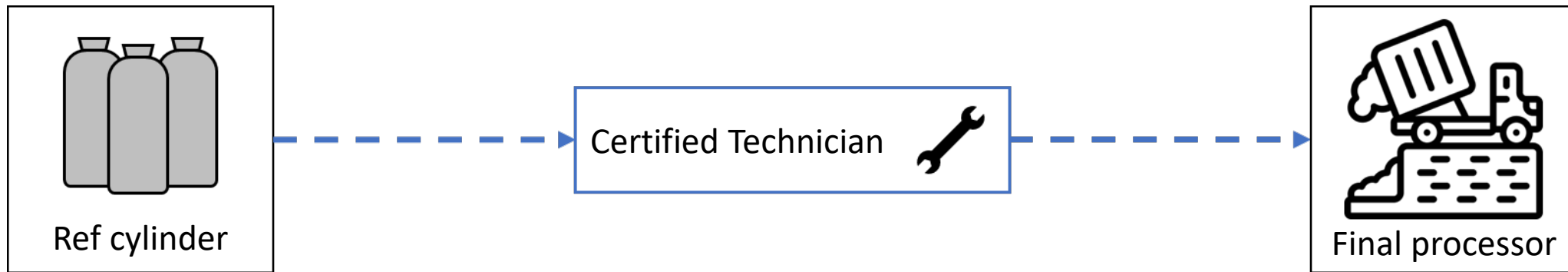
# Disposable Cylinders (compliance options example)



# Disposable Cylinders (compliance options example)



# Disposable Cylinders (alternate compliance example)



Certified technicians can evacuate the disposable cylinder to 15 in-Hg and discard the cylinder to a final processor with an accompanying certification statement that must be held as a record.

# Fire Suppression

- Requirements for recycled HFC fire suppressants
  - Beginning January 1, 2030, the initial charge or installation of fire suppression equipment must be done with recycled HFCs
  - Beginning January 1, 2026, servicing and/or repair of fire suppression equipment must be done with recycled HFCs
- Other requirements for fire suppression equipment include:
  - Required training for fire suppression technicians
  - Recycling of HFCs prior to the disposal of fire suppression equipment containing HFCs
  - Recordkeeping and reporting requirements

# ER&R Program Resources

## Additional Resources

ER&R webpage	<a href="http://www.epa.gov/climate-hfcs-reduction/managing-use-and-reuse-hfcs-and-substitutes">www.epa.gov/climate-hfcs-reduction/managing-use-and-reuse-hfcs-and-substitutes</a>
Final rule fact sheet	<a href="http://www.epa.gov/system/files/documents/2024-09/err-fact-sheet.pdf">www.epa.gov/system/files/documents/2024-09/err-fact-sheet.pdf</a>
Reducing HFCs homepage	<a href="http://www.epa.gov/climate-hfcs-reduction">www.epa.gov/climate-hfcs-reduction</a>
HFC data hub	<a href="http://www.epa.gov/climate-hfcs-reduction/hfc-data-hub-0">www.epa.gov/climate-hfcs-reduction/hfc-data-hub-0</a>
Refrigerant reclamation trends	<a href="http://www.epa.gov/section608/summary-refrigerant-reclamation-trends">www.epa.gov/section608/summary-refrigerant-reclamation-trends</a>
Ozone layer protection website	<a href="http://www.epa.gov/ozone-layer-protection">www.epa.gov/ozone-layer-protection</a>

## Additional questions

- Please send an email to [HFCEmissionsReductions@epa.gov](mailto:HFCEmissionsReductions@epa.gov)

# ER&R Program Resources

## Frequent Questions Webpage

[www.epa.gov/climate-hfcs-reduction/frequent-questions-phasedown-hydrofluorocarbons#er&r-rule](http://www.epa.gov/climate-hfcs-reduction/frequent-questions-phasedown-hydrofluorocarbons#er&r-rule)

## Sample Questions from our Frequent Questions

### **How do the leak repair provisions address equipment with multiple circuits?**

For a system with multiple circuits, each independent circuit is considered a separate appliance.

### **For what types of appliances are equipment owners or operators required to install and use an ALD system?**

ALD systems must be installed and used for new and certain existing commercial refrigeration or IPR appliances that have a full charge of 1,500 pounds or more of a refrigerant that contains an HFC or a substitute for an HFC with a GWP greater than 53.

Appliances used in comfort cooling are not required to have an ALD system installed, regardless of the charge size. However, if an appliance has a dual function (e.g., IPR and comfort cooling), an ALD system would be required, if the applicability criteria are otherwise met.



# Recap of Certain Requirements

## Leak Repair

**January 1, 2026**

- Covers appliances containing 15 pounds or more of a refrigerant that contains an HFC or a substitute for an HFC with a GWP above 53
- Suite of provisions, including leak detection, leak rate calculations, and more

## Automatic Leak Detection

Required for appliances installed on or after **January 1, 2026** (w/in 30 days of installation)

**January 1, 2027** – appliances installed on or after January 1, 2017, and before January 1, 2026

- Covers IPR and commercial refrigeration appliances containing 1,500 pounds or more of a refrigerant that contains an HFC or a substitute for an HFC with a GWP above 53

## Reclamation

**January 1, 2026**

- Reclaimed HFC refrigerants can contain no more than 15%, by weight, virgin HFCs

**January 1, 2029**

- Service/repair must be done with reclaimed HFCs (where HFCs are used) in the following subsectors:
  - Supermarket systems
  - Refrigerated transport
  - Automatic commercial ice makers

# Thank you!

Christian Wisniewski, [wisniewski.christian@epa.gov](mailto:wisniewski.christian@epa.gov)

Stratospheric Protection Division

Office of Atmospheric Protection, Office of Air and Radiation

U.S. Environmental Protection Agency

[www.epa.gov/climate-hfcs-reduction](http://www.epa.gov/climate-hfcs-reduction)

# Discussion



## Speakers

- Christian Wisniewski, U.S. EPA  
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## GreenChill

- Annie Kee, U.S. EPA  
[kee.annie@epa.gov](mailto:kee.annie@epa.gov)

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