



GreenChill Revised Store Certification Criteria

November 19, 2024

Today's Host



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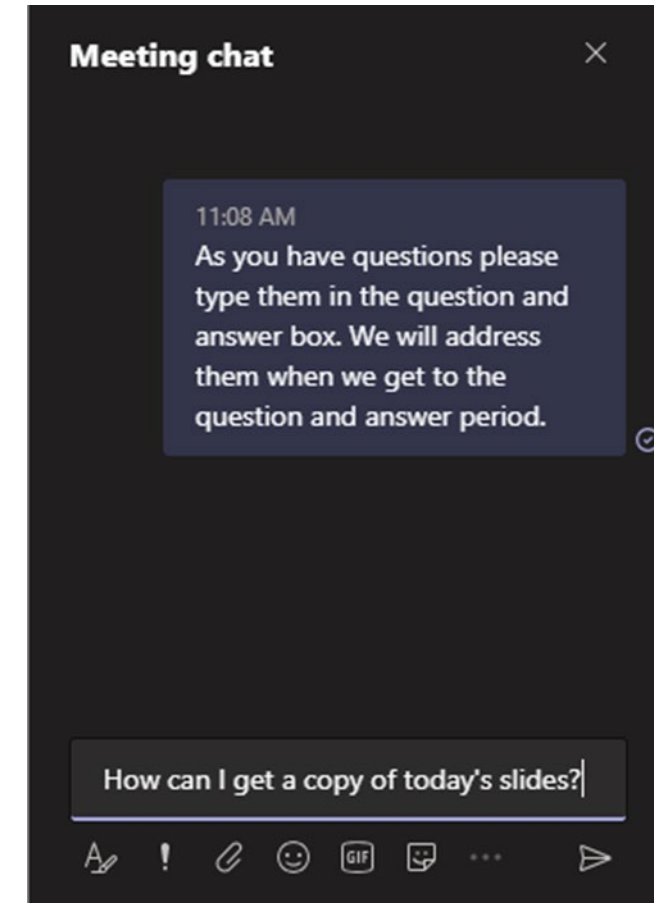
Annie is an Environmental Protection Specialist in the Stratospheric Protection Division (SPD) in EPA's Office of Atmospheric Protection, where she works on rulemakings under the American Innovation and Manufacturing (AIM) Act and partnership programs. Prior to SPD, she also worked on EPA's SmartWay 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
- 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 Webinars:
www.epa.gov/greenchill
- To receive notification when materials are posted email:
EPA-GreenChill@abtglob.com

Program Overview



GreenChill is an EPA partnership with food retailers to reduce refrigerant emissions and decrease stores' impact on the environment

GreenChill's mission is to incentivize and support the supermarket industry to:

- Transition to zero ozone depletion potential/ lower-global warming potential refrigerants
- Lower refrigerant charge sizes and eliminate leaks
- Adopt advanced refrigeration technologies and best environmental practices to minimize emissions

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

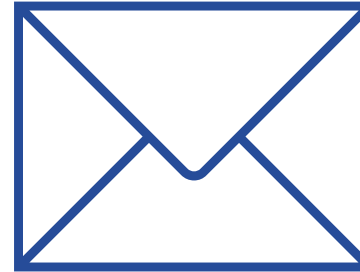
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Today's Speaker...

Chris Orvin



Chris Orvin

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Chris joined the Stratospheric Protection Division in March 2023 and has been working on the AIM Act grants funded through the Inflation Reduction Act as well as the GreenChill Store Certification Working Group. Before joining the Stratospheric Protection Division, Chris worked for 13 years in EPA's Office of Water on a variety of budget, performance, Congressional and programmatic matters, including most recently the Urban Waters Federal Partnership in the Office of Wetlands, Oceans and Watersheds.



GreenChill Revised Store Certification Criteria Webinar

November 19, 2024

Agenda



- Introductions and Welcome
- Background and Context
- Overview of Store Certification Program Changes
- Draft Guidance
 - Category 1 store criteria
 - Category 2 store criteria
- Sample Application Form
 - Overview
 - Demonstration
- Questions

Store Certification Program Goals



- Certified stores demonstrate leadership in food retail refrigerant management
- Any food retail store in the United States can apply; not necessary to be a GreenChill Partner



Current Criteria



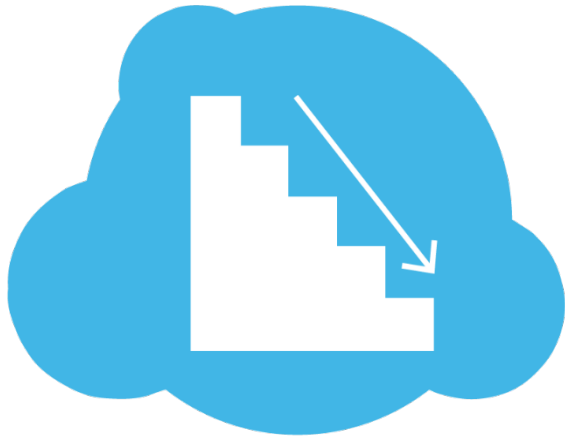
- Stores must only use non-ozone depleting refrigerants that have been found acceptable by EPA's Significant New Alternatives Policy (SNAP) program for use in retail food refrigeration end-uses
- Newly constructed stores must meet GreenChill's leak tightness testing standards
- Criteria based on meeting certain hydrofluorocarbon (HFC) refrigerant metrics

Certification Level	Average HFC Refrigerant Charge (lbs. per 1,000 BTU/hr)	Store-wide Annual HFC Refrigerant Emissions Rate
Silver	<1.75	<15%
Gold	<1.25	<15%
Platinum*	<0.5	<5%

**Platinum can alternatively be achieved if all refrigerant in the store's commercial refrigeration equipment has a global warming potential (GWP) < 150*

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 and their substitutes by maximizing reclamation and minimizing releases



Transition sectors to next-generation technologies through restrictions on HFCs

Reasons for Updating Criteria



- **Regulatory Landscape**

- New federal requirements established to begin the phasedown of HFCs and transition to lower-GWP alternatives (AIM Act)
- Some states have and/or are starting to adopt their own HFC requirements (California requires low-GWP in new stores)

- **Technology Changes and Improvements**

- Store Certification criteria have not been updated since 2008
- Technology and refrigerant advancements over the past decade

- **Market Trends**

- Increase in stores using stand-alone equipment seen over time; expected to continue

- **Accounting for HFC/Hydrofluoroolefin (HFO) Blends**

- Stores using less HFCs sometimes disqualified based on current certification standards

Store Certification Program Workgroup



- May 2023: Held kick-off meeting
- June 2023 - May 2024: continued regular group and one-on-one meetings with partners on updated criteria
- June 2024: Presented detailed proposed criteria to workgroup
- Summer 2024: Held additional subgroup meetings with retailers, original equipment manufacturers (OEMs)/chemical producers/reclaimers
- September 2024: Announced change at annual Recognition Event at FMI
- Next steps
 - Finalizing documentation and forms
 - Providing training and guidance

Workgroup Members



- A-Gas
- ALDI
- Arkema
- Chemours
- Grocery Outlet
- H-E-B Grocery Company
- HillPhoenix
- Honeywell
- Hudson
- Hussmann
- Hy-Vee
- Kysor/Warren
- Meijer
- National Refrigerants
- Raley's
- Target
- Weis Markets
- Whole Foods Market
- Zero Zone

Definitional Changes: Category 1 and Category 2 Equipment



GreenChill will have **different criteria** for stores based on **the age of their equipment**.

- Program goals and assumptions remain unchanged, i.e.:
 - continue transition away from ODS;
 - going above and beyond regulatory requirements;
 - better than industry average (e.g., leak rate, charge-to-load ratio)
- GreenChill is differentiating between:
 - equipment installed **before** January 1, 2025 (**Category 1 equipment**) and
 - equipment installed **after** January 1, 2025 (**Category 2 equipment**)
- Revised criteria based on the age of the equipment helps recognize:
 - older stores making voluntary shifts to lower-GWP refrigerant that aren't required by regulations
 - newer stores that are going above and beyond regulatory requirements.

Additional Changes



- Changes to Recognition Categories:
 - Category 1 stores using older equipment retain the **Silver, Gold, Platinum** designations
 - Category 2 stores will receive a "**GreenChill Certified**" certification
- Changes to Schedule:
 - Instead of July 1 – June 30 store certification reporting year cycle, starting in January 1, 2025, we will use a Jan 1 – Dec 31 reporting cycle to match the Corporate Partnership reporting cycle

Criteria for Category 1 Equipment



- Criteria for Older Equipment (installed before 1/1/2025):
 - Apply a GWP weight to the existing charge-to-load ratio and emissions criteria
 - Approximately 20% more stringent than previous criteria, based on historical data

Level	GWP x Refrigerant Charge/Load	GWP x Annual Emissions/Load
Platinum	<1,600	<0.03
Gold	1,600 – 2,000	0.03 – 0.08
Silver	>2,000 – 2,400	>0.08 – 0.13

Category 1 Example 1: R-404A Store



Application Example 1

Store A uses R-404A in the primary medium- and low-temperature refrigeration systems.

Store A Data Points:

- Operational before January 1, 2025
- Load: 850 MBTU/hour
- Refrigerant: R-404A
 - GWP: 3,922
- Charge: 1,200 pounds
- Annual emissions: 100 pounds
 - Emissions rate: 0.08

Category 1 Example 1: R-404A Store



GWP-weighted refrigerant charge-to-load ratio

$$3,922 \text{ GWP} \times 1,200 \text{ pounds} \div 850 \text{ MBTU/hour} =$$

5,537 pounds/MBTU/hour

GWP-weighted annual emissions-to-load ratio

$$3,922 \text{ GWP} \times (100 \text{ pounds} \div 1,200 \text{ pounds}) \times$$
$$1,200 \text{ pounds} \div 850 \text{ MBTU/hour} \div 2,204.623$$

= 0.21 MTCO₂e/MBTU/hour

Result: Store A does not qualify for certification

Level	GWP x Refrigerant Charge/Load	GWP x Annual Emissions/Load
Platinum	<1,600	<0.03
Gold	1,600 – 2,000	0.03 – 0.08
Silver	>2,000 – 2,400	>0.08 – 0.13

Category 1 Example 2: R-448A Store



Application Example 2

Store B uses R-448A in the primary medium- and low-temperature refrigeration systems.

Store B Data Points:

- Operational before January 1, 2025
- Load: 500 MBTU/hour
- Refrigerant: R-448A
 - GWP: 1,386
- Charge: 730 pounds
- Annual emissions: 50 pounds
 - Emissions rate: 0.07

Category 1 Example 2: R-448A Store



GWP-weighted charge-to-load ratio

$1,386 \text{ GWP} \times 730 \text{ pounds} \div 500 \text{ MBTU/hour} =$
2,024 pounds/MBTU/hour (Silver Certification)

GWP-weighted annual emissions-to-load ratio

$1,386 \text{ GWP} \times (50 \text{ pounds} \div 730 \text{ pounds}) \times 730$
 $\text{pounds} \div 500 \text{ MBTU/hour} \div 2,204.623$
= 0.06 MTCO₂e/MBTU/hour (Gold Certification)

Result:

- Store B earns Silver-Level Certification based on GreenChill's protocol for awarding the lowest level achieved across criteria

Level	GWP x Refrigerant Charge/Load	GWP x Annual Emissions/Load
Platinum	<1,600	<0.03
Gold	1,600 – 2,000	0.03 – 0.08
Silver	>2,000 – 2,400	>0.08 – 0.13

Category 1 Example 3: Hybrid CO₂ Store



Application Example 3

Store C uses R-744 in the primary medium-and low-temperature refrigeration systems. A secondary refrigerant, R-448A, is used in condensing units serving walk-in coolers and freezers.

Store C Data Points:

- Operational before January 1, 2025
- Load: 2,170 MBTU/hour
- Refrigerant₁: R-744
 - GWP refrigerant₁: 1
- Charge refrigerant₁: 4,500 pounds
- Annual emissions refrigerant₁: 450 pounds
 - Emissions rate refrigerant₁: 0.1
- Refrigerant₂: R-448A
 - GWP refrigerant₂: 1,386
- Charge refrigerant₂: 110 pounds
- Annual emissions refrigerant₂: 11 pounds
 - Emissions rate refrigerant₂: 0.1

Category 1 Example 3: Hybrid CO₂ Store



GWP-weighted charge-to-load ratio

- $[(1 \text{ GWP} \times 4,500 \text{ pounds}) + (1,386 \text{ GWP} \times 110 \text{ pounds})] \div 2,170 \text{ MBTU/hour} = \mathbf{72.3 \text{ pounds/MBTU/hour}}$

GWP-weighted annual emissions-to-load ratio

- $[(1 \text{ GWP} \times 0.1 \text{ emissions rate} \times 4,500 \text{ pounds}) + (1,386 \text{ GWP} \times 0.1 \text{ emissions rate} \times 110 \text{ pounds})] \div 2,170 \text{ MBTU/hour} \div 2,204.623 = \mathbf{0.003 \text{ MTCO}_2\text{e/MBTU/hour}}$

Result: Store C earns Platinum-Level Certification

Level	GWP x Refrigerant Charge/Load	GWP x Annual Emissions/Load
Platinum	<1,600	<0.03
Gold	1,600 – 2,000	0.03 – 0.08
Silver	>2,000 – 2,400	>0.08 – 0.13

Criteria for Category 2 Stores



- **Stores with equipment installed after Jan 1, 2025 must meet:**
 - GWP <150
 - Low GWP weighted charge-to-load ratio (equivalent to or better than Platinum level for Category 1 equipment)
 - Low GWP weighted emissions rate (equivalent to or better than Platinum level for Category 1 equipment)
- **Stores must also meet 2 of the following 5 criteria:**
 - Low GWP in primary refrigeration system (<10 GWP)
 - Lower-GWP refrigerant in HVAC (<400)
 - Use of advanced refrigeration technology
 - Use of reclaimed refrigerant
 - Use of a technician training program

Criteria for Category 2 Stores: Advanced Technology



- **Advanced Technology:** Must use at least one of the following technologies in the store's primary refrigeration system:
 - Mechanical Subcooling
 - Thermal Energy Storage
 - Predictive Analytics Software
 - Automatic Leak Detection (ALD) (*note regulatory requirements under Emissions Reduction and Reclamation program*)
 - Condensing Units with GWP <10

Criteria for Category 2 Stores: Advanced Technology



■ **Supporting documentation:**

- Refrigeration schedule depicting advanced technology
- Signed letter from design engineer, refrigeration technician, or original equipment manufacturer attesting to the installation of the advanced technology at the store location
- Data from installed and operational advanced technology (e.g., operating parameters and logged leak monitoring data from an ALD system)
- Statement describing procedures to address alarms from ALD systems (if pursuing the ALD criterion)

Criteria for Category 2 Stores: Technician Training



- **Technician Training:** Implement a technician training program across all stores that educates internal or in-house refrigeration technicians on proper equipment installation, service, repair, maintenance, and disposal practices, and emerging technologies and refrigerants to reduce refrigerant leaks and ensure efficient operation

Criteria for Category 2 Stores: Technician Training



- **Supporting documentation:** An annual signed statement providing the following for in-house technician training:
 - The total number and percentage of technicians trained or retrained within the last three years. The names of individual technicians are not needed
 - The approximate length in hours of the training curriculum for participants
 - If the technician training program was developed internally or by a third-party educator
 - The training program outline, module titles, or other curriculum materials to demonstrate the minimum content
 - A general description of updates or improvements to the training curriculum from past offerings, if any

Criteria for Category 2 Stores: Use of Reclaim



- **Use of Reclaim:** To satisfy this criteria applicants must send recovered refrigerants for reclamation to an EPA-certified reclaimer, and/or use reclaimed refrigerants for service and/or initial charge of equipment, with proper documentation.
 - **Note:** Refrigerant that is recovered from one refrigeration system and used in another system without being reclaimed to AHRI (Air-Conditioning, Heating, and Refrigeration Institute) purity standards by an EPA-certified reclaimer does not meet this criterion.

Criteria for Category 2 Stores: Use of Reclaim



- **Supporting documentation:** Any one of the following:
 - Store-level documentation
 - Signed documentation from technician or refrigerant wholesaler attesting that purchased refrigerant was reclaimed by an EPA-certified reclaimer
 - Company-level documentation
 - Signed documentation from head of refrigeration (or equivalent position) attesting to refrigerant recovery and reclamation practices implemented at the chain-level
 - Signed contract or letter certifying an agreement with an EPA-certified reclaimer(s) or distributor(s) to purchase reclaimed refrigerants, as supplies allow
 - Store or company-level documentation
 - Invoice (with pricing redacted) or other certification letter from an EPA-certified reclaimer listing the refrigerants and amounts recovered and sold for reclamation or purchased as reclaimed refrigerants

Summary of Revised Criteria



- **Category 1 Stores: Silver, Gold, Platinum** for equipment installed **before** January 1, 2025
 - GWP weighted charge-to-load ratio
 - GWP weighted emissions rate
- **Category 2 Stores: Certified** for equipment installed **after** January 1, 2025
 - **Must meet:**
 - GWP <150
 - Low GWP weighted charge-to-load ratio
 - Low GWP weighted emissions rate
 - **Must meet 2 of 5:**
 - Low GWP in primary refrigeration system (<10 GWP)
 - Lower-GWP refrigerant in HVAC (<400)
 - Use of advanced refrigeration technology
 - Use of reclaimed refrigerant
 - Use of a technician training program

Sample EPA Application: Overview and Walkthrough



- **Overview of Required Data and Documentation**
 - Leak rate data (existing stores)
 - Leak tightness documentation (new stores)
 - Refrigeration legend or schedule depicting all remote commercial refrigeration loads in MBTUs/hour
 - Charge size documentation
 - Reclaim documentation (if applicable)
 - Training program documentation (if applicable)
 - HVAC documentation (if applicable)
 - Advanced refrigeration technologies (if applicable)

- **Brief demonstration** of an application

Question and Answer Session



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