



THE GREENCHILL PARTNERSHIP



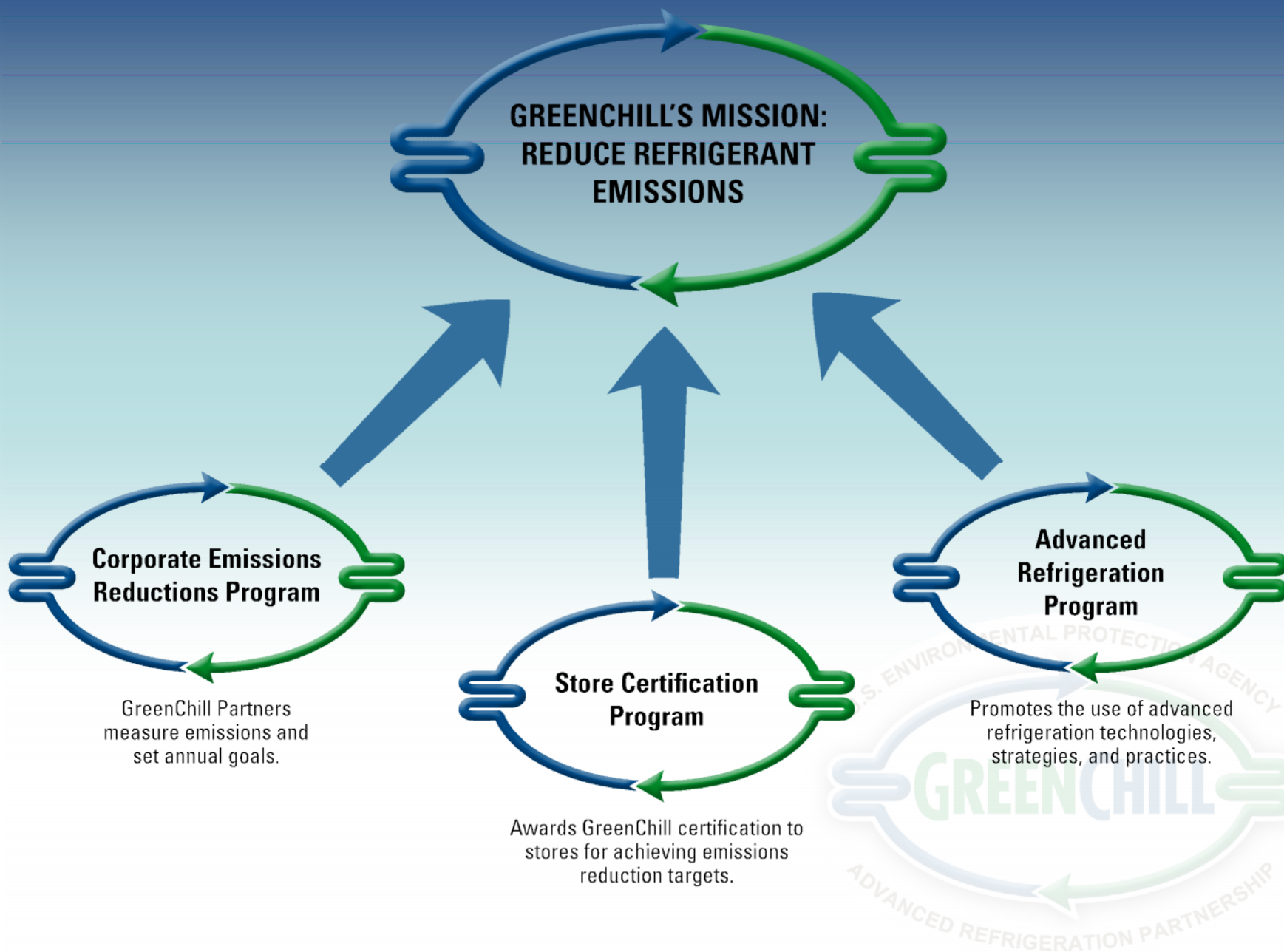
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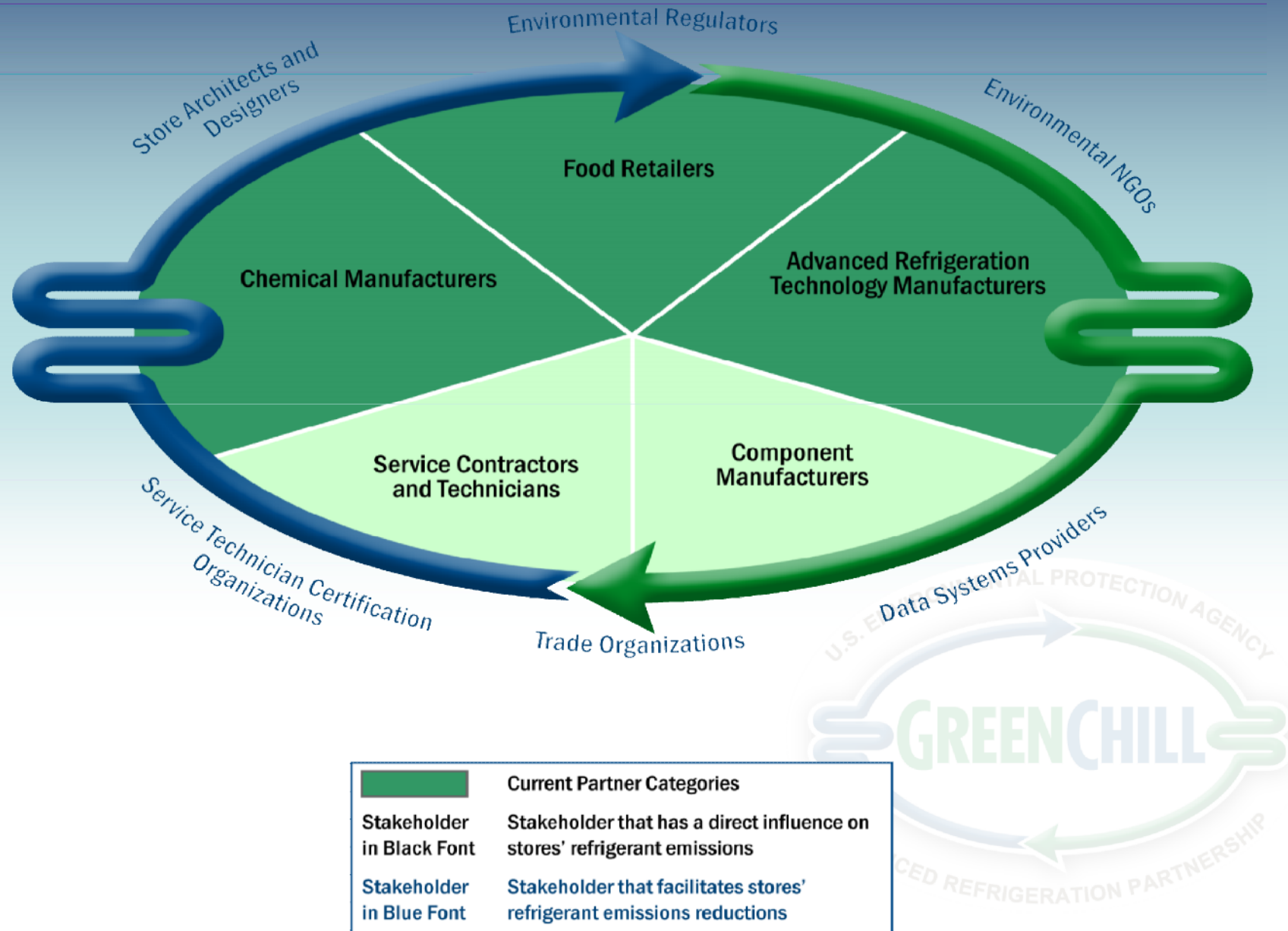
EPA's GreenChill Program

- ▶ **GREENCHILL** is an EPA partnership with food retailers to:
 - ▶ reduce refrigerant emissions
 - ▶ decrease their impact on the ozone layer and climate change
- ▶ Achieve mission by providing supermarket industry with information and assistance to:
 - ▶ Transition to refrigerants with better environmental profiles
 - ▶ Lower refrigerant charge sizes and eliminate leaks
 - ▶ Adopt green refrigeration technologies and environmental best practices





GreenChill's Stakeholders



How “The Partnership” Works

The Corporate Emissions Reduction Program

- ▶ **Sign agreement and commit to:**
 - ▶ **Measure corporate-wide refrigerant stocks and emissions**
 - ▶ **Select, measure and report baseline year**
 - ▶ **Measure and report annually**
 - ▶ **Set annual emissions reduction goal**
 - ▶ **Receive EPA recognition if successful**
 - ▶ **Submit refrigerant management plan annually**





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Best Emissions Rate Award

- ▶ Corporate-wide emissions rate (commercial refrigeration, HVAC, and stand alone units) of 6.5% in 2010
- ▶ 5 partner companies have corporate-wide emissions rates of <10%





Most Improved Emissions Rate Award

- ▶ Estimated national emissions rate is 25%
- ▶ GreenChill partners are significantly better:
 - ▶ 6 partners at 10% or lower
 - ▶ 60% of all partners below 15%
- ▶ This year's award winner achieved a reduction of 17.3% in 2010





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Emissions Reduction Goal Achievement Award

- ▶ Only two partners achieved 2010 emissions reduction goal
- ▶ All partners set very challenging annual goals
- ▶ GreenChill Partner average commercial refrigeration emissions rate is about 13% since 2008
- ▶ Emissions reductions of 7.6% & 6% in one year



GreenChill's Store Certification Program Overview

- ▶ EPA recognition for green refrigeration
- ▶ Three award levels: platinum, gold & silver
- ▶ Objective criteria for store achievement
 - ▶ Refrigerant charge
 - ▶ Refrigerant leak rate or installation leak tightness
 - ▶ Type of refrigerants used
- ▶ Process is easy, fast and free – any store can apply
- ▶ See <http://www.epa.gov/greenchill/certcenter.html> for standards, guidance, protocols, application forms



How the Store Certification Program Works

▶ 67 Stores Currently Certified

▶ 2 Platinum

- ▶ Platinum store prevents minimum 95% emissions of typical store
- ▶ Leak rates of platinum stores = 0% since construction

▶ 28 Gold

- ▶ prevents minimum 75% of emissions of typical store
- ▶ Average leak rate of gold stores = .5%

▶ 37 Silver

- ▶ prevents minimum 65% of emissions of typical store
- ▶ Average leak rate of silver stores = 2.7%





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Best of the Best Award Best GreenChill Certified Store

- ▶ Best of all newly certified stores of the past year
- ▶ Only new platinum award this year
- ▶ 1st CO2 cascade system in the nation to achieve GreenChill Platinum
- ▶ Only 235 pounds of refrigerant used for commercial refrigeration



ADVANCED REFRIGERATION PARTNERSHIP



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Store Certification Excellence Award Most GreenChill Certified Stores

- ▶ **Company achieved 14 store certification awards over the past year**
- ▶ **12 silver awards; 2 gold awards**
- ▶ **Proof that centralized DX systems can & do achieve store certification awards if they are designed with standards in mind**



How the Advanced Refrigeration Program Works

- ▶ **Advanced technologies, strategies, practices**
- ▶ **Data driven refrigerant management**
- ▶ **Explore new technologies**
- ▶ **Best practices**
- ▶ **Monthly webinars**
- ▶ **Regular partner meetings**
- ▶ **Ongoing projects**
- ▶ **Use the LinkedIn Group**
- ▶ **Call, ask questions, get help**

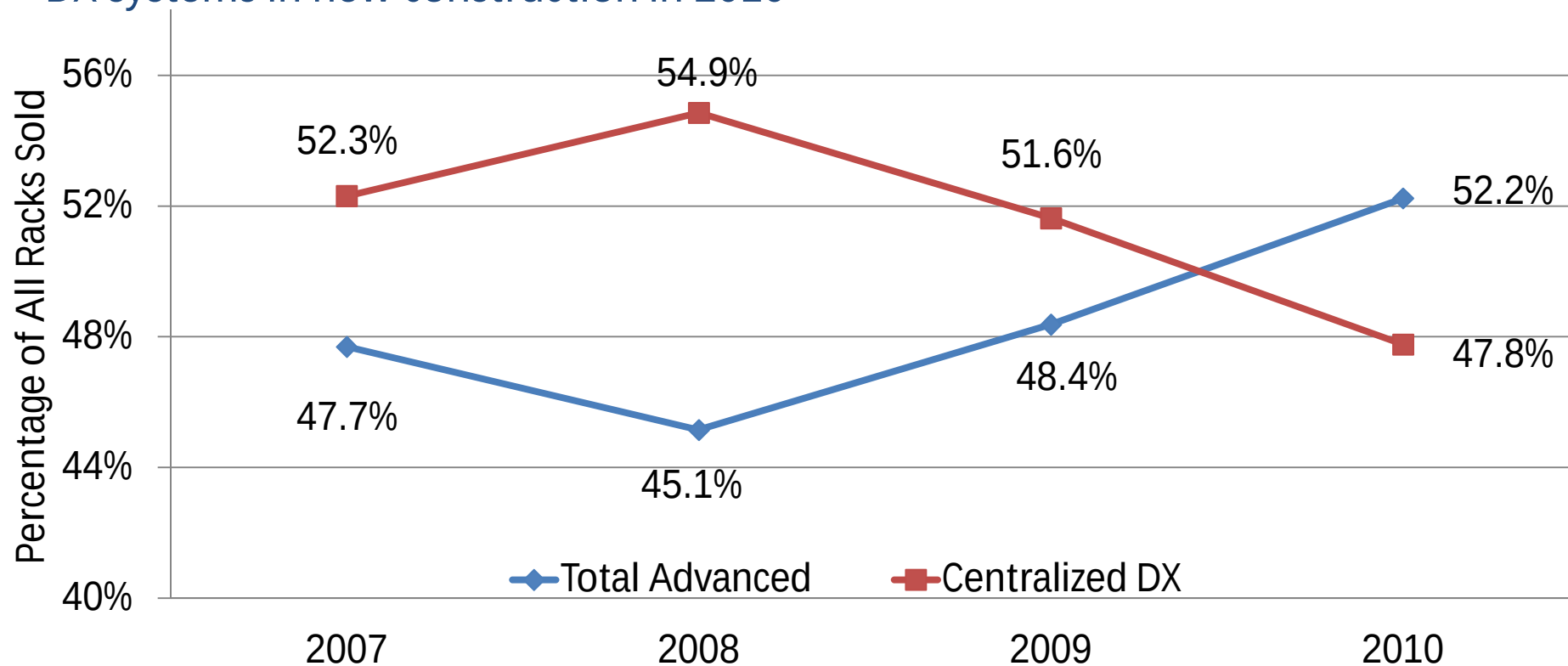




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For the 1st time ever, advanced refrigeration systems outnumbered centralized DX systems in new construction in 2010



GreenChill's Monthly Webinar Series

► Past GreenChill webinars available under Archives at <http://www.epa.gov/greenchill/events.html>

► To receive monthly webinar invitations, send email to EPA-GreenChill@stratusconsulting.com

The screenshot displays the EPA GreenChill website. The header includes the EPA logo and the text "U.S. ENVIRONMENTAL PROTECTION AGENCY". The main navigation bar is titled "Ozone Layer Protection - Partnerships" and includes a search bar. Below the navigation bar, the page is divided into several sections:

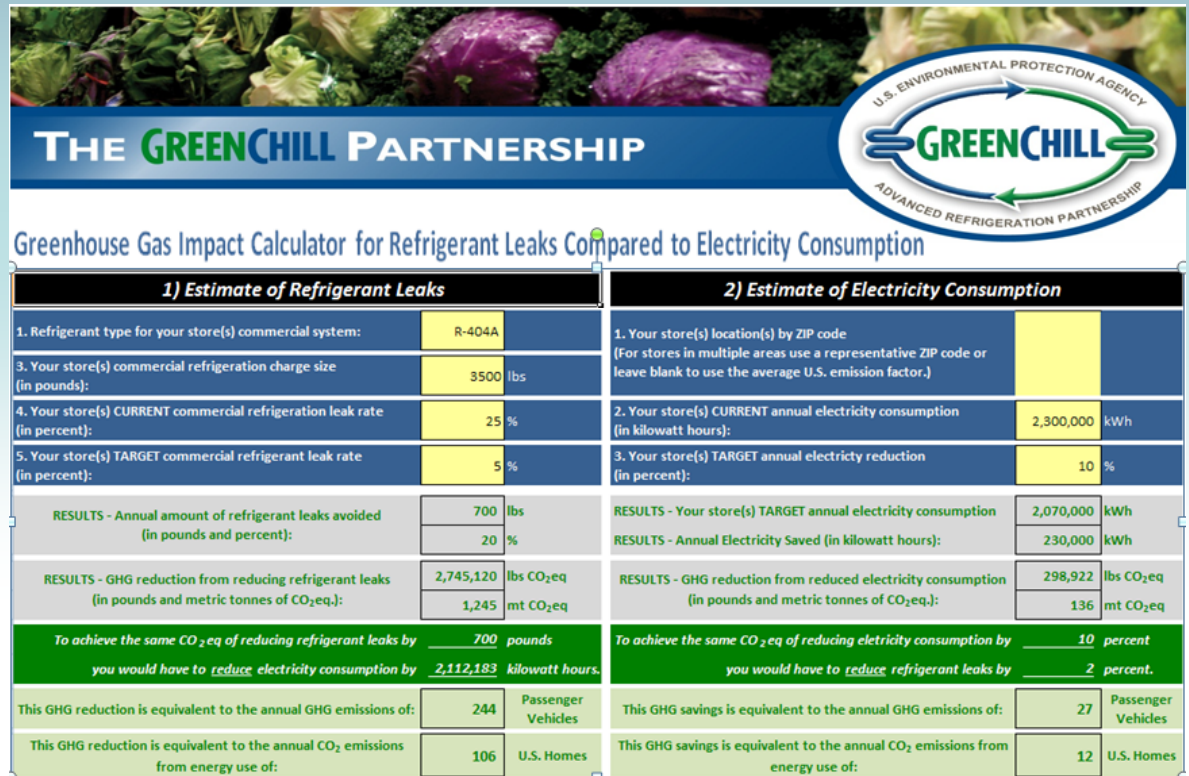
- Events and Webinars:** A section describing GreenChill participation in various events, including webinars, and providing a link to the GreenChill's Linked In Group.
- Webinar Archives:** A list of past webinars, including "An Overview of Supermarket Refrigeration Technologies", "Commercial Refrigeration Leak Prevention and Repair", "Secondary System Remodels Using Existing DX Equipment", "GreenChill Store Certification Program Overview", "Reducing EPA Promoted Don't Fry Day", "EPA's Retail Portal", "EPA's Proposed Amendments to the Section 608 Leak Repair Regulations", "Condenser Innovations for Commercial Refrigeration", "GreenChill Store Certification Program Overview", "GreenChill's Supermarket Climate Behavior and Consumers from Supermarkets", "Ammonia Use in Commercial Refrigeration", "CO2 Use in Commercial Refrigeration", "Refrigerant Leaks - Causes and Prevention", "Overview on Commercial Refrigerants - Where are we headed?", "Overview of Supermarket Advanced Refrigeration Technologies", "EPA's Don't Fry Day Promotional Opportunities", "Retailer Energy Alliance and GreenChill", "GreenChill's Store Certification Program", "EPA's New Rules, Refrigerated Products and Allocation", "EPA's SNAP Program", "EPA's Information", and "GreenChill's Store Certification Program Kick-off".
- Podcasts and Interviews:** A list of podcasts and interviews, including "EPA's Technical School Podcast about GreenChill", "Star Market Platinum Award Podcast Audio Program", "Star Market Platinum Award Podcast Presentation in SlideShare/PPT Document", "Star Market Platinum Award Podcast Transcript", and "EPA's Information Podcast about the GreenChill Partnership".
- Past Event Information:** A section for "Target New Partner Award Ceremony", including "Photos from the award ceremony" and "Conference Agenda (PDF)".
- National HVACR Educators & Trainers Conference:** A section for "EPA Update & GreenChill Overview (PDF)".

The right sidebar features the GreenChill logo and a section titled "Upcoming Events" with the following dates and topics:

- 9/10/11 - 9/23/11: 10th Energy Storage Development Conference
- 9/19/11 (7:00 AM): GreenChill Awards Ceremony
- 9/20/11 (11:00 AM): EPA Priority Decision

Advanced Refrigeration Program Calculator: Climate Impact of Refrigerant Leaks

Calculate the climate impact of a store or company's refrigerant leaks at
www.epa.gov/greenchill
 (under Reports, Guidelines and Tools → Tools and Calculators)



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U.S. ENVIRONMENTAL PROTECTION AGENCY
 GREENCHILL
 ADVANCED REFRIGERATION PARTNERSHIP

Greenhouse Gas Impact Calculator for Refrigerant Leaks Compared to Electricity Consumption

1) Estimate of Refrigerant Leaks		2) Estimate of Electricity Consumption	
1. Refrigerant type for your store(s) commercial system:	R-404A	1. Your store(s) location(s) by ZIP code (For stores in multiple areas use a representative ZIP code or leave blank to use the average U.S. emission factor.)	
3. Your store(s) commercial refrigeration charge size (in pounds):	3500 lbs	2. Your store(s) CURRENT annual electricity consumption (in kilowatt hours):	2,300,000 kWh
4. Your store(s) CURRENT commercial refrigeration leak rate (in percent):	25 %	3. Your store(s) TARGET annual electricity reduction (in percent):	10 %
5. Your store(s) TARGET commercial refrigerant leak rate (in percent):	5 %		
RESULTS - Annual amount of refrigerant leaks avoided (in pounds and percent):		RESULTS - Your store(s) TARGET annual electricity consumption	
700 lbs		2,070,000 kWh	
20 %		RESULTS - Annual Electricity Saved (in kilowatt hours):	
		230,000 kWh	
RESULTS - GHG reduction from reducing refrigerant leaks (in pounds and metric tonnes of CO ₂ eq.):		RESULTS - GHG reduction from reduced electricity consumption (in pounds and metric tonnes of CO ₂ eq.):	
2,745,120 lbs CO ₂ eq		298,922 lbs CO ₂ eq	
1,245 mt CO ₂ eq		136 mt CO ₂ eq	
To achieve the same CO ₂ eq of reducing refrigerant leaks by 700 pounds you would have to reduce electricity consumption by 2,112,183 kilowatt hours.		To achieve the same CO ₂ eq of reducing electricity consumption by 10 percent you would have to reduce refrigerant leaks by 2 percent.	
This GHG reduction is equivalent to the annual GHG emissions of:		This GHG savings is equivalent to the annual GHG emissions of:	
244 Passenger Vehicles		27 Passenger Vehicles	
This GHG reduction is equivalent to the annual CO ₂ emissions from energy use of:		This GHG savings is equivalent to the annual CO ₂ emissions from energy use of:	
106 U.S. Homes		12 U.S. Homes	

ADVANCED REFRIGERATION PARTNERSHIP

Advanced Refrigeration Program

Calculator: Climate Impact of Refrigerant Leaks

- ▶ Uses electricity as comparison
- ▶ Average supermarket's refrigerant leaks impact climate as much as the store's entire annual electricity use (2,346,000 kw hrs/yr)

To achieve the same CO₂ eq of reducing refrigerant leaks by 700 pounds
you would have to reduce electricity consumption by 2,112,183 kilowatt hours.

To achieve the same CO₂ eq of reducing electricity consumption by 10 percent
you would have to reduce refrigerant leaks by 2 percent.

Advanced Refrigeration Program Calculator: Financial Impact of Refrigerant Leaks

Calculate how much product a store must sell just to pay the replacement cost of leaked refrigerant

You have to sell 19,514 gallons of milk to pay the replacement cost of 100 pounds of refrigerant

1) Cost to Replace Leaked Refrigerant			2) Sales/Profit		
1. Refrigerant type:	R 101A	click inside the yellow box and select the refrigerant from the drop-down menu	1. Item to be sold (milk, frozen peas, hotdogs, etc.):	milk	type the name of the product in the yellow space
2. Amount of refrigerant leaked (in pounds):	100	type number of pounds in yellow box	2. Units (gallons, pounds, packs, ounces, etc.):	gallons	type the unit of the product in the yellow space
3. Price per pound that you pay for refrigerant:	\$6.83	for \$/100, type in /100	3. Sales price per unit	\$3.50	for \$3.50, type in 3.50
			4. Profit margin per unit sold (in percent):	1.00	for 1%, type in 1; for 2.03%, type in 2.03
Cost to replace leaked refrigerant: \$683			You have to sell 19,514 gallons of milk to pay the replacement cost of 100 pounds of refrigerant		

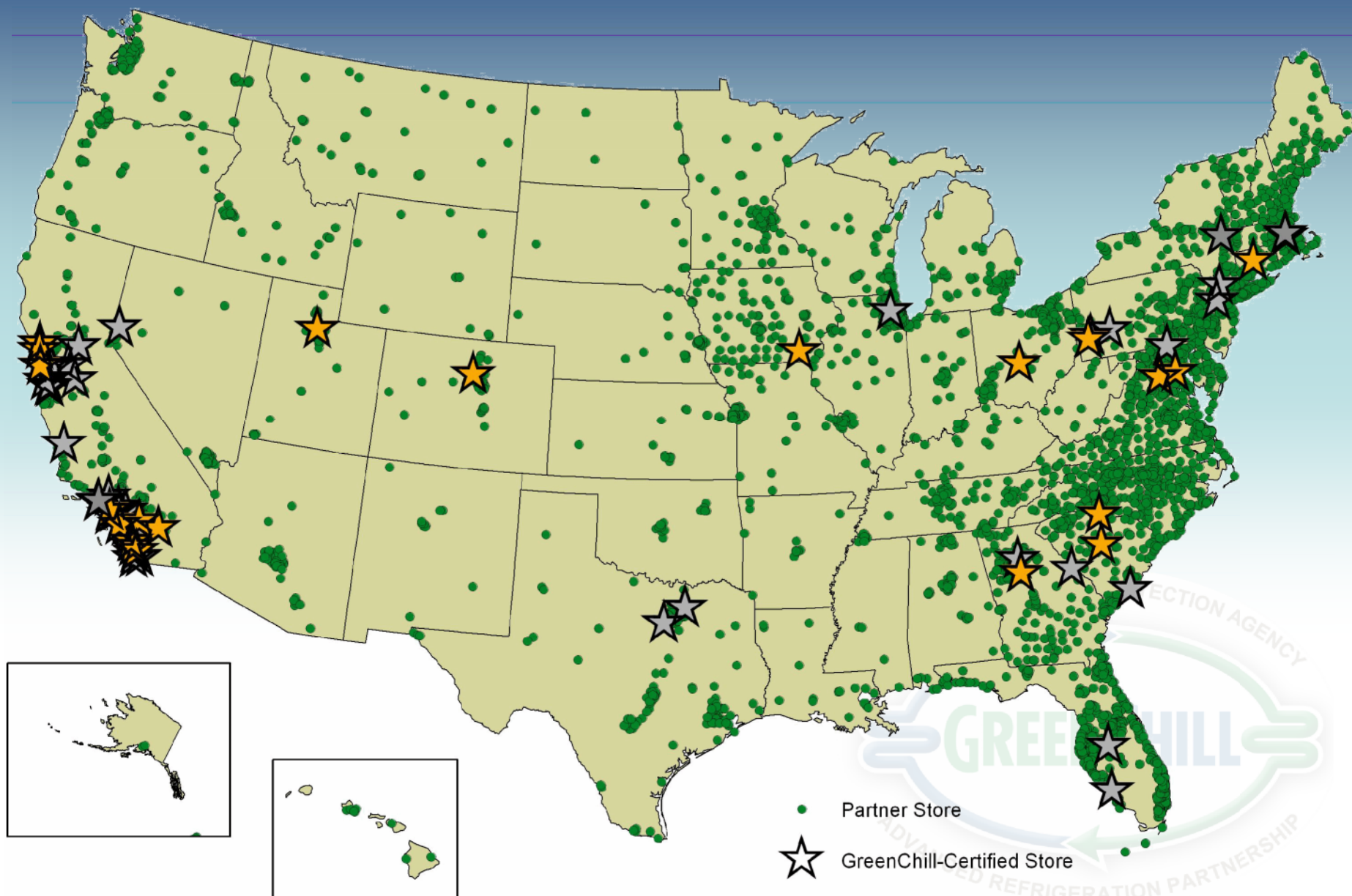
*This calculator deals solely with refrigerant replacement costs. There are of course, other costs incurred due to refrigerant leaks, such as service technician costs for parts and labor, costs due to decreases in energy efficiency when the refrigeration system is not properly charged, and food spoilage costs.

Advanced Refrigeration Program GreenChill Best Practice Guidelines

- ▶ **GreenChill Leak Prevention & Repair Guideline**
- ▶ **GreenChill Installation Leak Tightness Guideline**
- ▶ **GreenChill R-22 Retrofit Guideline**
- ▶ **Available at**
<http://epa.gov/ozone/partnerships/greenchill/ptnrresources.html>



The GreenChill Partnership



EPA's Stratospheric Protection Division Regulatory Update

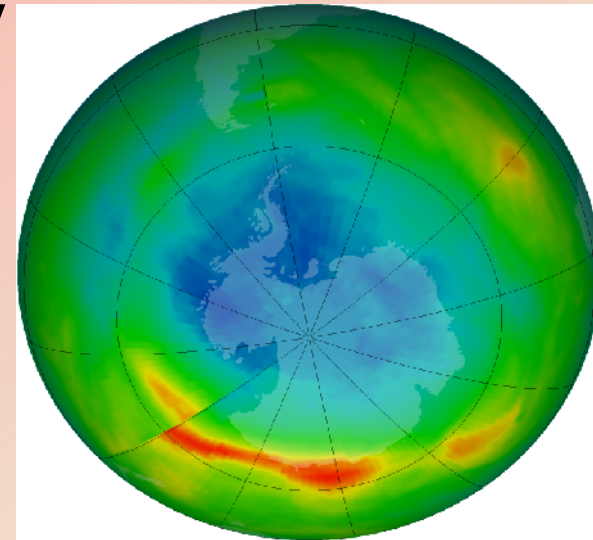


Regulatory Topics

- **R-22 Phaseout & Supply**
- **R-22 Use**
- **Proposed Amendments to §608 Regulations**
- **SNAP**
- **Greenhouse Gas Reporting**
- **Pre-Charged Appliances**
- **Metered Dose Inhalers**
- **Display Case Insulating Foam**
- **Possible Future Regulatory Topics?**

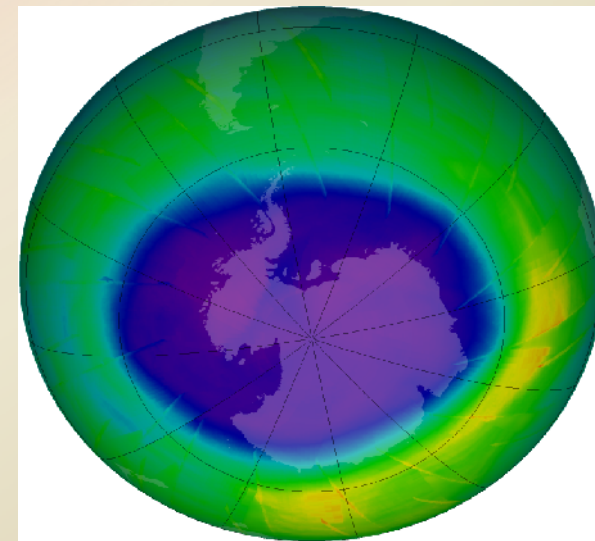
Ozone Layer Recovery

- Chlorine in stratosphere increased steadily from 1960 & peaked at end of 20th century
- Expected to gradually decrease through 21st century
- End of 21st century, ozone-depleting chemicals back to 1960 level



Sept
1979

Total Ozone (Dobson Units)
110 220 330 440 550



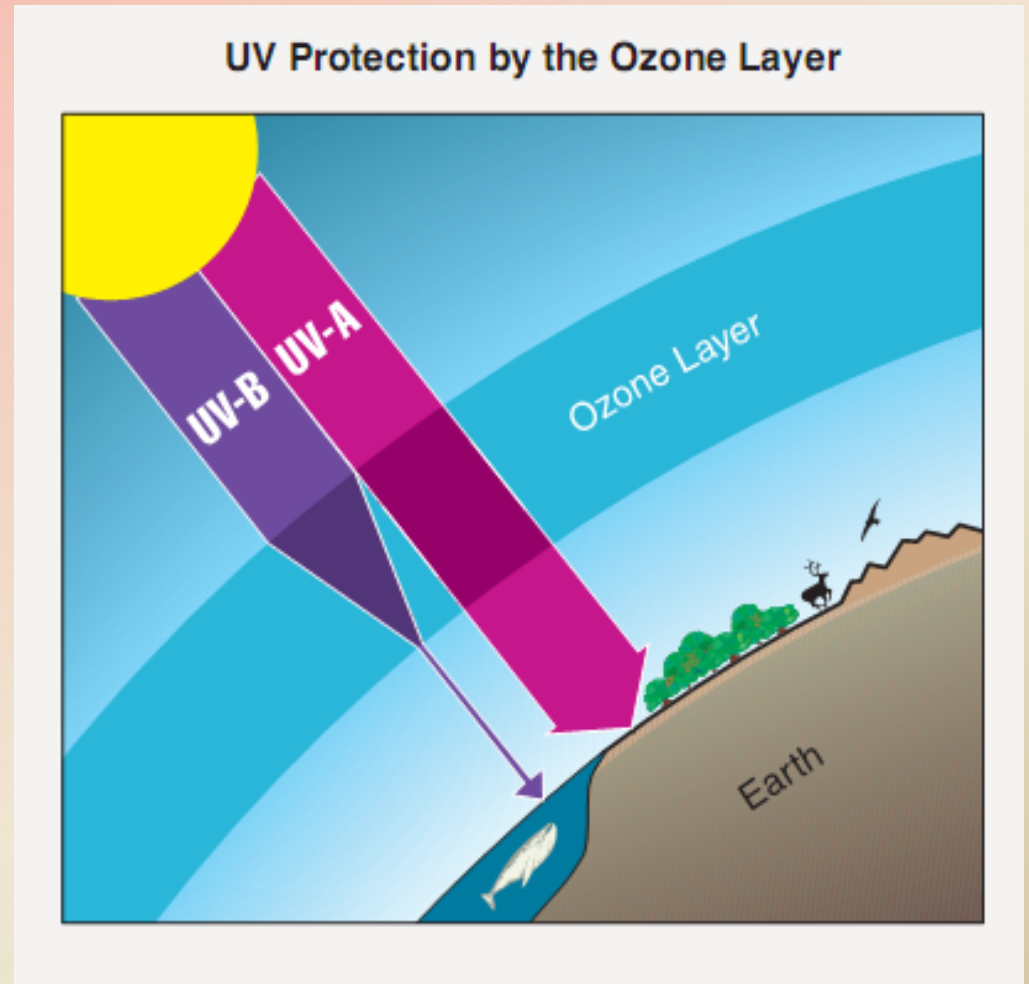
Sept
2009

Source: *Twenty Questions and Answers about the ozone layer: 2010 Update*
(Scientific Assessment of Ozone Depletion: 2010)

Source: NASA's Ozone Hole Watch Web Site, Sept. 2009

Environment & Human Health

- **Ozone layer shields Earth from ultraviolet radiation:**
 - Skin cancer
 - Cataracts
 - Weakened immune systems
 - Damage to plant life, single-cell organisms, aquatic ecosystems
- **Economic impacts**



**1 in 5
Americans will
develop skin
cancer**



R-22 Phaseout & Supply

- **Goal = gradually transition away from R-22**
- **Phaseout not meant to cause shortages in 2010 - meant to get us to zero by 2020**
- **Jan 1st, 2010: decreased amount of R-22 allowed to be produced or imported for domestic use**
- **2012-2014: R-22 phaseout continues with annual step-down approach**
- **2015: R-22 supply will be maximum 10% of baseline**
- **2020: Phaseout of all production and import of R-22**

Clarification on “Fresh” R-22 Use

- **Virgin R-22 is only allowed for maintenance and repair (i.e. servicing) of existing systems**
- **Changes to an existing R-22 system that expand the system (increase the cooling capacity) are not considered regular servicing/maintenance**
 - **Fresh (virgin) R-22 may not be used**
 - **Whole system must now use recovered or reclaimed R-22**
- **Keep detailed records of recovered or reclaimed R-22 used**

§608 Regulations: Proposed Amendments

- **Reduce use/emissions of ozone-depleting refrigerants to lowest achievable level**
- **Establish similar requirements for owners/operators of comfort cooling, commercial refrigeration, & industrial process refrigeration appliances**
- **Clarification of definitions & regulatory interpretations**

- **GreenChill Webinar-EPA's Proposed Amendments to the §608 Leak Repair Regulations**
 - **<http://epa.gov/ozone/partnerships/greenchill/events.html>-under Webinar Archives**

§608 Regulations: Proposed Amendments

- **Lowers leak repair “trigger rate” from 35% to 20%**
- **Requires verification & documentation of all repairs**
- **Requires retrofit or retirement of appliances that cannot be sufficiently repaired**
- **Allows for flexibility in repair or retrofit timelines**
- **Requires replacement of appliance components with history of failures**
- **Mandates recordkeeping of determination of full charge & fate of recovered refrigerant**

§608 Regulations: Proposed Amendments

- **Next step: respond to all public comments**
- **Finalize the rule**
- **Broader EPA review**
- **Broader review by other federal agencies, coordinated by the White House's Office of Management & Budget**
- **Publication in Federal Register (Goal is mid 2012)**

The SNAP Program – New Refrigerants

■ Proposed Hydrocarbon Rule

- **Allows use of R-600a (Isobutane), R-441A (HCR-188C1) in new household refrigerators & freezers**
- **Allows use of R-290 (Propane) in new retail food self-contained units**
- **Use conditions: equipment must meet UL standards, charge limit of 57 grams of R-600a and 150 grams of R-290, red colored ports, unique fittings**

■ Final rule

- **EPA not allowed to give information on final rule before publication**
- **Intra-EPA review completed**
- **Interagency review begun (< 90 days from early Sept.)**
- **EPA Administrator reviews & signs rule, published**
- **Final rule expected later this year / early next year**

Pre-Charged Appliance Rule

- **Prohibits sale & distribution of**
 - **A/C & refrigeration appliances pre-charged with R-22**
 - **Components pre-charged with R-22**
- **Applies to appliances & components manufactured on/after 1/1/2010**
 - **Allowed to import a used soda vending machine containing R-22 that was manufactured prior to 1/1/10**
 - **Allowed to purchase a dry R-22 component to repair an existing R-22 refrigeration system**

EPA's Retail Web Portal

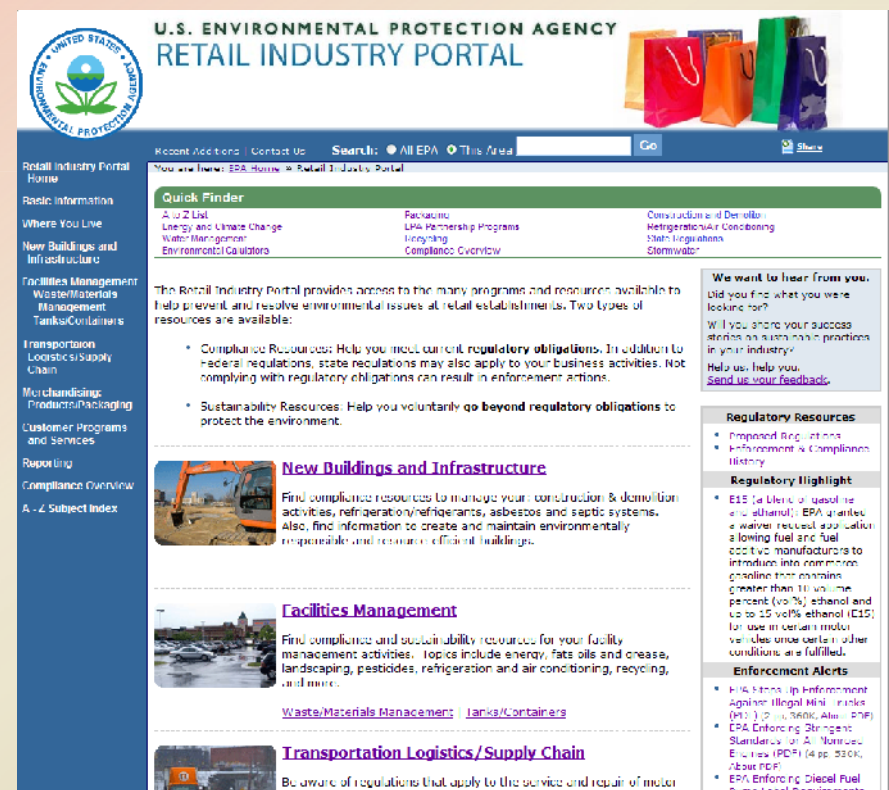
- Combines all relevant EPA regulatory, compliance, & sustainability info for retailers in one place

- Go to

www.epa.gov/retailindustry

- Webinar recording on EPA's Retail Portal available under Archives at

<http://www.epa.gov/greenchill/events.html>



EPA Contact Information

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