

Information Collection

Forms and Instructions

EPA Information Collection Request Number 2349.01

EPA's GreenChill Program

INSTRUCTION 1 - Introduction to GreenChill Partnership - Corporate Emission Reduction Program

The screenshot shows a web browser window displaying the EPA GreenChill website. The browser's address bar shows the URL <http://www.epa.gov/greenchill/become-greenchill-partner>. The page title is "Become a GreenChill Partner". The main content area includes a "Who Can Join" section with a list of requirements for food retailers, a section for refrigeration system manufacturers, and a "How to Join" section. A callout box on the right highlights "Attention component manufacturers and service technicians:" and provides information about their role in the partnership. The GreenChill logo is visible on the right side of the page.

Related Topics: [GreenChill](#) [Contact Us](#) [Share](#)

Become a GreenChill Partner

Who Can Join

The GreenChill Partnership focuses on food retailers including supermarkets, grocery stores, supercenters, and wholesale clubs. To be eligible to join the partnership, a food retailer must:

- Be willing to reduce company-wide refrigerant emissions
- Have no current Clean Air Act enforcement issues

Refrigeration system manufacturers that promote the adoption of advanced refrigeration technologies, strategies, and practices are also eligible to join the partnership.

How to Join

To join GreenChill, an authorized representative of the prospective Partner Company must agree to and sign a GreenChill Partnership Agreement. The agreement outlines the Partnership's goals and the responsibilities that each partner must meet. Once EPA completes its enforcement screening and the Partnership Agreement is countersigned by an EPA representative, the new Partner is admitted into the Partnership.

For more information about joining the GreenChill Partnership and to receive a Standard Partnership Agreement, please contact [Tom Land](#) or call 202-343-9185.

Attention component manufacturers and service technicians:

Although the GreenChill Partnership is currently focusing on food retailers, GreenChill recognizes the critical part component manufacturers and service technicians play in the effort to reduce emissions of ozone depleting substances and greenhouse gases. For more information on how you can get involved in GreenChill:

[visit our component manufacturer and service technician page.](#)

[Contact Us](#) to ask a question, provide feedback, or report a problem.

FORM 1 - GreenChill Advanced Refrigeration Partnership Agreement

GREENCHILL ADVANCED REFRIGERATION PARTNERSHIP AGREEMENT FOR SUPERMARKET PARTNERS

This is a voluntary agreement between [] (herein referred to as the "Partner") and the U.S. Environmental Protection Agency's (EPA) GreenChill Advanced Refrigeration Partnership (herein referred to as the "Program," "GreenChill Partnership," or "GreenChill"). The goal of the Program is to reduce refrigerant emissions from food retailers and decrease their impact on the ozone layer and climate change. This agreement takes effect when signed by both Parties. ***GreenChill is a non-regulatory initiative. It does not provide relief for any violations of the Clean Air Act and/or its Amendments.***

EPA'S RESPONSIBILITIES

- Track and report partners' annual corporate-wide refrigerant inventory and emissions.
 - Identify, research, compile and communicate news, successful strategies, and cost-saving opportunities for reducing refrigerant emissions in commercial refrigeration systems.
 - Sponsor research relating to such strategies and new technologies.
 - Benchmark Partner progress in reducing refrigerant emissions in commercial refrigeration, allowing the Partner to compare progress to others within the industry.
 - Identify an EPA representative responsible for assisting the Partner in implementing the Program and notify the Partner of any change in the designated liaison.
 - Provide Partner recognition for achievements through press releases, brochures, articles, and awards.
 - Protect all information and data submitted to EPA or its partners to the fullest extent of the law in accordance with EPA regulations at 40 CFR Part 2, including the provisions on protecting confidential business information (CBI). For information to be treated as CBI, it must be designated by the Partner as CBI at the time of submittal.
-

PARTNER RESPONSIBILITIES

- Establish a base year for annual corporate-wide (aggregated) reporting of the inventory of refrigerant stock and refrigerant emissions. The base year may be the year in which this agreement is signed or up to two years prior.
- Complete and submit annually to EPA a corporate-wide inventory of refrigerant stock and emissions (aggregate, not by facility).
- Develop and submit annually to EPA a Corporate Refrigerant Management Plan that sets a refrigerant emissions reduction goal (goal to be approved by EPA) and describes technologies, strategies, and practices that will be used to achieve that goal.
- Commit to using only non-ozone-depleting refrigerant substitutes found acceptable under EPA's Significant New Alternatives Policy (SNAP) Program in all commercial refrigeration applications in new construction and store remodels involving rack additions or replacements.
- Exchange information on Program development/implementation and best practices with other Program partners.
- Designate a GreenChill Partnership Representative and notify EPA of any change in the designated liaison.
- Communicate the Program to employees and cooperate with EPA efforts to publicize the Program.

GENERAL TERMS

- As a general principle of the Program, each party to this agreement agrees to assume the good faith of the other party and to notify the other if any issues arise. Either party can terminate this agreement at any time without prior notification or penalties, with no further obligation. EPA will not comment publicly regarding withdrawal of Partners.
- Any violation of the Clean Air Act or its Amendments is grounds for EPA, at its discretion, to terminate this agreement with a partner and for removal from the GreenChill Partnership.
- The Partner agrees to cease, upon termination of this agreement, any written, electronic, or oral representation that could be reasonably construed to indicate continued participation in the Program, including the use of the GreenChill Partnership name and mark.
- The Partner agrees that it will adhere to the "Guidelines for Using the GreenChill Advanced Refrigeration Partnership Mark."
- The Partner agrees that the activities it undertakes connected with this agreement are not intended to provide services to the federal government and that the Partner will not submit a claim for compensation to any federal agency/department.
- The Partner agrees that it will not claim or imply that its participation in the Program constitutes EPA approval or endorsement of anything other than the commitment to the GreenChill Advanced Refrigeration Partnership.
- This agreement does not create any right or benefit, substantive or procedural, enforceable by law, and does not direct or apply to any person outside of the parties referenced in the agreement.

The undersigned officials execute this partnership agreement on behalf of their Parties.

EPA: Cindy Newberg, Chief, Alternatives and Emissions Reduction Branch, Stratospheric Protection Division, U.S. EPA

Signature: _____ Date: _____

Authorized Partner Company Representative:

Name: _____ Title: _____

Signature: _____ Date: _____

Partner's Designated GreenChill Representative:

Name: _____ Title: _____

Company: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone: _____ Fax: _____ Email: _____

Please sign the partnership agreement and send a scanned copy by email to: land.tom@epa.gov

The public reporting and recordkeeping burden for this collection of information is estimated to average [XX hours] per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

INSTRUCTIONS for FORM 2 & OPTIONAL TEMPLATE 3 – Guidelines for Partner Annual Reporting

Guidelines for Completing GreenChill Supermarket Partners' Annual *Installed Refrigerant and Emissions Corporate Reports* and *Corporate Refrigerant Management Plans*



In collecting information to complete the GreenChill Supermarket Partner's *Annual Installed Refrigerant and Emissions Corporate Report*, partners should refer to "Direct Fugitive Emissions from Refrigeration, Air Conditioning, Fire Suppression, and Industrial Gases," at: <http://www.epa.gov/climateleadership/center-corporate-climate-leadership-direct-fugitive-emissions-refrigeration-air>. In particular, Partners may find sections that discuss ways to enhance data quality and accuracy particularly relevant.

- Use of the Material Balance Method (Sections 2.3 and 3.3): Releases of refrigerants can be calculated based on the inventory, purchases and sales of refrigerants, as well as changes in total refrigerant capacity of equipment during the emissions reporting period.
- Completeness (Section 4): To ensure an organization's inventory is complete, Partners should strive to include all emission sources within the identified inventory boundaries.
- Uncertainty Assessment (Section 5): There is uncertainty associated with all methods of calculating emissions. EPA does not recommend organizations quantify uncertainty, but Partners may want to identify key areas of uncertainty in their emissions calculations and use the most accurate data possible or conservative values when estimating emissions.
- Documentation (Section 6): To ensure that emissions calculations are transparent, Partners should strive to document main data sources for emissions calculations.
- Inventory Quality Assurance and Quality Control (Section 7): Care should be taken that releases are not double-counted. Tracking specific refrigerants separately is important.

Guidelines to Complete: *GreenChill Installed Refrigerant and Emissions Corporate Report*

Section 1: General Partner Information

- The reporting year is the most recent calendar year (1/1 through 12/31).
- The number of stores you enter should be the number of stores at your selected "point in time" reporting date (see Section 2).
- The Partner's base year will vary depending on when your company joined GreenChill. Partners must select a base year when they join the Partnership. Partners are permitted to select base years that pre-date their entry into the Partnership if they are able to provide installed refrigerant and emissions data for those years. Partners should ask EPA if they have questions about their base year.

Section 2: Corporate-Wide Installed Refrigerant

- Use the blank reporting form provided by EPA. Do not change the order of the refrigerants listed in the blank report. Add information for refrigerants not listed in the form in the "INSERT OTHER" rows.
- Report aggregate installed refrigerant data for all retail stores.

- Each report on installed refrigerant should represent a “point in time.” This is because the amount of installed refrigerant changes over the course of the year (e.g., companies may have purchased, sold, closed, or remodeled stores throughout the year). Once a point-in-time is selected, Partners should use the same date every year. Many Partners choose December 31 of each year as the point-in-time on which their reports are based (i.e., “How much refrigerant was in every store owned on December 31, 2012?”)
- Reports should include the following:
 - Installed refrigerant for commercial refrigeration systems (required)
 - Installed refrigerant for smaller self-contained equipment and air conditioning systems (optional, but encouraged)
 - Installed refrigerant in offices, break-rooms, etc. located inside retail stores
 - Installed refrigerant for climate-friendly refrigerants. Reporting on these refrigerants has been required since the 2013 reporting year.
- Reports should omit the following:
 - Installed refrigerant in office buildings, distribution centers, warehouses, etc. that are separate from retail stores
 - Refrigerant stored in cylinders on- or off- site

Section 3: Corporate-Wide Refrigerant Emissions

- Use the blank reporting form provided by EPA. Do not change the order of the refrigerants listed in the blank report. Add information for refrigerants not listed in the form in the “INSERT OTHER” rows.
- Report aggregate “emissions” information for all retail stores.
- Partners should report a running total of emissions for the entire period of January 1 through December 31 (i.e., “How much refrigerant was emitted to the atmosphere in 2012?”). This is different from Section 2, which requires a point-in-time installed refrigerant estimate.
- Reports should include the following:
 - Emissions for commercial refrigeration systems (required)
 - Emissions for smaller self-contained equipment and air conditioning systems (optional, but encouraged)
 - Emissions from offices, break-rooms, etc. located inside retail stores
 - Known emissions from retired systems
 - Emissions for climate-friendly refrigerants. Reporting on these refrigerants has been required since the 2013 reporting year.¹

1. Although emissions of these refrigerants must be reported, they will not be factored into the calculations that are used to determine the annual best emissions rate award (i.e., total emissions from all sources as a percentage of installed refrigerant). The amount of these of these climate-friendly refrigerants that is installed (i.e., in charges) - on the other hand - will be factored into the calculations. This approach is meant to ensure that Partners who use refrigerants that have very small impacts on climate change are not penalized. This approach is used only for determining the annual best emissions rate award.

- Reports should omit the following:
 - Emissions from office buildings, distribution centers, warehouses, etc. that are separate from retail stores
 - Refrigerant recovered/recycled from retired systems
 - First-fill charging when installing new systems or after remodels

Final steps

- Verify that installed refrigerant and emissions are reported in pounds or kilograms consistently.
- Certify with signature that the data report uses best estimates and that it represents a good faith effort to obtain and report accurate information.
- Submit a signed copy using instructions on the form.

Guidelines for Completing Corporate Refrigerant Management Plan

- There is no standard form for refrigerant management plans. EPA provides an optional template that Partners can use.
- The plan must include the Partner's emissions rate goal for the current year.
 - The emissions rate goal is for commercial equipment with a charge size greater than 50 pounds.
 - Partners should set their emissions rate goal *lower* than their previous year's emissions rate (Partners can easily determine their previous year's emissions rate from the installed refrigerant and emissions reporting form). If Partners submit an emissions rate goal that is higher than their previous year's emissions rate, they will not be eligible for a GreenChill Goal Achievement Award next year.
- Partners are encouraged to also submit a stretch goal that is more aggressive than the required emissions rate goal. Partners can earn additional awards for achieving their stretch goals.
- The plan must include a qualitative description of how the Partner will reach the emissions rate goal identified. GreenChill uses this info "qualitatively" to help determine GreenChill projects for the coming year.
- Partners are not measured or tracked based on information in the Corporate Refrigerant Management Plan.

GreenChill Contacts

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INSTRUCTIONS for FORM 2 & OPTIONAL TEMPLATE 3 – Guidelines for Partner Annual Reporting



Greenhouse Gas Inventory Guidance Direct Fugitive Emissions from Refrigeration, Air Conditioning, Fire Suppression, and Industrial Gases



November, 2014

The U.S. EPA Center for Corporate Climate Leadership's (The Center) GHG guidance is based on The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (GHG Protocol) developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD). The Center's GHG guidance is meant to extend upon the GHG Protocol to align more closely with EPA-specific GHG calculation methodologies and emission factors, and to support the Center's GHG management tools and its Climate Leadership Awards initiative.

For more information regarding the Center for Corporate Climate Leadership, visit www.epa.gov/climateleadership.

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Section 1: Introduction

An important category of Scope 1 direct greenhouse gas (GHG) are fugitive emissions, which result from the direct release to the atmosphere of GHG compounds from various types of equipment and processes. This guidance document focuses on several fugitive emissions sources that are common for organizations in many sectors: refrigeration and air conditioning systems, fire suppression systems, and the purchase and release of industrial gases.

Historically, air conditioning and refrigeration equipment utilized various Ozone Depleting Substances (ODSs), primarily chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs). However, in accordance with the Clean Air Act Amendments of 1990 (Title VI) and the Montreal Protocol, these ODSs are being phased out of manufacture and use in the United States.

Hydrofluorocarbons (HFCs) and, to a lesser extent, perfluorocarbons (PFCs) are used as substitutes for the regulated ODSs. In addition, some air conditioning and refrigeration systems use non-halogenated refrigerants such as ammonia, carbon dioxide (CO₂), propane, or isobutane. Also, some fire suppression equipment, which historically used ozone-depleting halons, use carbon dioxide (CO₂), inert gases, and other substances.

Emissions from the refrigeration and air conditioning sector result from the manufacturing process, from leakage and service over the operational life of the equipment, and from disposal at the end of the useful life of the equipment. These gases have 100-year global warming potentials (GWPs), which are typically greater than 1,000 times that of CO₂, so their potential impact on climate change can be significant (see examples in Table 1). By the same token, any reductions of these gases can have a large potential benefit.

This guidance document addresses the following:

- Emissions from users of refrigeration and air conditioning equipment including household refrigeration, domestic air conditioning and heat pumps, mobile air conditioning, chillers, retail food refrigeration, cold storage warehouses, refrigerated transport, industrial process refrigeration, and commercial unitary air conditioning systems.
- Emissions from fixed and portable fire suppression equipment.
- Direct emissions from purchased industrial gases. These gases can be used in processes such as manufacturing, testing, or laboratory applications.

Emissions from aerosols, solvent cleaning, foam blowing, or other applications are not addressed by this protocol.

1.1. Greenhouse Gases Included

The emissions sources addressed by this guidance document could result in emissions of any of the GHGs included in Table 1.

Ozone depleting substances include a number of different compounds such as CFCs, HCFCs, and halons, all of which have global warming potentials. As mentioned, these ODSs are being phased out of production due to their ozone depleting properties. However, some entities may still use these substances directly or in blends within refrigeration, air conditioning, or fire suppression equipment.

It is customary to exclude CFCs, HCFCs, and halons from GHG inventories because they are regulated and are being phased out by the Clean Air Act. These substances are also excluded from GHG inventories because their global warming potentials are complicated by the fact that they deplete stratospheric ozone, which is a greenhouse gas. The GHG Protocol allows for reporting of these ODSs as separate memo items on an organization's GHG inventory. They are reported as total release of gases but no global warming potentials are applied and they do not contribute to an organization's total CO₂-equivalent emissions inventory. Therefore, organizations that currently use ODSs and switch to HFCs or PFCs may show an increase in their overall GHG emissions inventory. Documenting the use of these ODSs will help communicate the reasons for this increase.

1.2. Manufacturing vs. Use Phase Emissions

This document only applies to Scope 1 GHG emissions resulting from operations at the reporting organization's facilities. For refrigeration, air conditioning, and fire suppression equipment, these emissions may take place during the installation, use, or disposal. Refrigerants and fire suppressants may be released from equipment leaks throughout their operating life or from catastrophic leaks. Also, when equipment is installed, repaired, or removed, refrigerants and fire suppressants may be released if proper recovery processes are not used. Fire suppressants are also emitted to extinguish fires. Emissions that occur during the manufacturing or disposal of equipment or purchased gases are Scope 3 indirect emissions, and are not included in an organization's Scope 1 emissions.

Table 1: Global Warming Potentials		
Common Name	Formula	GWP*
Carbon dioxide	CO ₂	1
Methane	CH ₄	25
Nitrous oxide	N ₂ O	298
Sulfur hexafluoride	SF ₆	22,800
Nitrogen trifluoride	NF ₃	17,200
HFC-23	CHF ₃	14,800
HFC-32	CH ₂ F ₂	675
HFC-41	CH ₃ F	92
HFC-125	C ₂ H ₅ F	3,500
HFC-134	CHF ₂ CHF ₂	1,100
HFC-134a	C ₂ H ₂ F ₄	1,430
HFC-143	CH ₂ FCHF ₂	353
HFC-143a	C ₂ H ₃ F ₃	4,470
HFC-152	CH ₂ FCH ₂ F	53
HFC-152a	C ₂ H ₄ F ₂	124
HFC-161	CH ₃ CH ₂ F	12
HFC-227ea	C ₃ HF ₇	3,220
HFC-236cb	CH ₂ FCF ₂ CF ₃	1,340
HFC-236ea	CHF ₂ CHFCF ₃	1,370
HFC-236fa	C ₃ H ₂ F ₆	9,810
HFC-245ca	CH ₂ FCF ₂ CHF ₂	693
HFC-245fa	CHF ₂ CH ₂ CF ₃	1,030
HFC-365mfc	CH ₃ CF ₂ CH ₂ CF ₃	794
HFC-43-10mee	CF ₃ CHFCF ₂ CF ₃	1,640
PFC-14	CF ₄	7,390
PFC-116	C ₂ F ₆	12,200
PFC-218	C ₃ F ₈	8,830
PFC-318	c-C ₄ F ₈	10,300
PFC-3-1-10	C ₄ F ₁₀	8,860
PFC-4-1-12	C ₅ F ₁₂	9,160
PFC-5-1-14	C ₆ F ₁₄	9,300
PFC-9-1-18	C ₁₀ F ₁₈	>7,500

*100-year GWPs from Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (2007)

Table 2: GWPs for Refrigerant Blends

ASHRAE #	Blend Composition	GWP*
R-401A	53% HCFC-22, 34% HCFC-124, 13% HFC-152a	16
R-401B	61% HCFC-22, 28% HCFC-124, 11% HFC-152a	14
R-401C	33% HCFC-22, 52% HCFC-124, 15% HFC-152a	19
R-402A	38% HCFC-22, 6% HFC-125, 2% propane	2,100
R-402B	6% HCFC-22, 38% HFC-125, 2% propane	1,330
R-403B	56% HCFC-22, 39% PFC-218, 5% propane	3,444
R-404A	44% HFC-125, 4% HFC-134a, 52% HFC 143a	3,922
R-406A	55% HCFC-22, 41% HCFC-142b, 4% isobutane	0
R-407A	20% HFC-32, 40% HFC-125, 40% HFC-134a	2,107
R-407B	10% HFC-32, 70% HFC-125, 20% HFC-134a	2,804
R-407C	23% HFC-32, 25% HFC-125, 52% HFC-134a	1,774
R-407D	15% HFC-32, 15% HFC-125, 70% HFC-134a	1,627
R-407E	25% HFC-32, 15% HFC-125, 60% HFC-134a	1,552
R-408A	47% HCFC-22, 7% HFC-125, 46% HFC 143a	2,301
R-409A	60% HCFC-22, 25% HCFC-124, 15% HCFC-142b	0
R-410A	50% HFC-32, 50% HFC-125	2,088
R-410B	45% HFC-32, 55% HFC-125	2,229
R-411A	87.5% HCFC-22, 11 HFC-152a, 1.5% propylene	14
R-411B	94% HCFC-22, 3% HFC-152a, 3% propylene	4
R-413A	88% HFC-134a, 9% PFC-218, 3% isobutane	2,053
R-414A	51% HCFC-22, 28.5% HCFC-124, 16.5% HCFC-142b	0
R-414B	5% HCFC-22, 39% HCFC-124, 9.5% HCFC-142b	0
R-417A	46.6% HFC-125, 5% HFC-134a, 3.4% butane	2,346
R-422A	85.1% HFC-125, 11.5% HFC-134a, 3.4% isobutane	3,143
R-422D	65.1% HFC-125, 31.5% HFC-134a, 3.4% isobutane	2,729
R-423A	47.5% HFC-227ea, 52.5% HFC-134a	2,280
R-424A	50.5% HFC-125, 47% HFC-134a, 2.5% butane/pentane	2,440
R-426A	5.1% HFC-125, 93% HFC-134a, 1.9% butane/pentane	1,508
R-428A	77.5% HFC-125, 2% HFC-143a, 1.9% isobutane	3,607
R-434A	63.2% HFC-125, 16% HFC-134a, 18% HFC-143a, 2.8% isobutane	3,245
R-500	73.8% CFC-12, 26.2% HFC-152a, 48.8% HCFC-22	32
R-502	48.8% HCFC-22, 51.2% CFC-115	0
R-504	48.2% HFC-32, 51.8% CFC-115	325
R-507	5% HFC-125, 5% HFC143a	3,985
R-508A	39% HFC-23, 61% PFC-116	13,214
R-508B	46% HFC-23, 54% PFC-116	13,396

* 100-year GWPs from Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (2007). GWPs of blended refrigerants are based on their HFC and PFC constituents, which are based on data from <http://www.epa.gov/ozone/snap/refrigerants/refblend.html>.

Section 2: Methods for Calculating Emissions

Most large organizations will have emissions from refrigeration and air conditioning equipment in one form or another. However, the potential emissions sources and level of data available may differ greatly. For instance, a supermarket chain with large refrigeration systems may have on-site storage of refrigerants and track detailed data concerning refrigerant use, while an industrial organization may simply use air conditioning in its office space and not track detailed data on refrigerant use. Often organizations whose core business does not include the use of this type of equipment exclude the associated GHG emissions from their GHG inventory as not material. However, the materiality of a source can only be established after it has been assessed. This does not necessarily require a rigorous quantification of all sources, but at a minimum, an estimate based on available data should be developed for all sources of emissions.¹

Four methods with varying levels of accuracy and data collection required are outlined in this guidance to calculate GHG emissions. Organizations may calculate fugitive GHG emissions from refrigeration and air conditioning equipment, fire suppression systems, or purchased industrial gases with one of the following methods.

Section 2.1 describes a preliminary Screening Method to estimate emissions from refrigeration, air conditioning, and fire suppression equipment based on the type of equipment used and emission factors. This method requires the least actual data collection and is not applicable for quantifying emissions from purchased gases. It is recommended that this method be used only as a screening tool because the emissions factors used in the approach are highly uncertain. Emission factors vary between individual pieces of equipment and also vary over time. Even if the amount of refrigerant added to a piece of equipment has been tracked carefully, allowing the previous leak rate of that equipment to be established, that leak rate can change after a leak is repaired or as the equipment ages. If emissions from this equipment are determined to be significant when compared to an organization's other emission sources (e.g., stationary combustion, mobile sources), then one of the other methods should be applied to calculate emissions more accurately.

Section 2.2 describes a Method for Purchased Gases which applies to an organization that purchases, uses, and releases industrial gases. If an organization maintains an inventory of industrial gases or uses equipment that maintains a charge of an industrial gas, similar to a charge of refrigerant in air conditioning equipment, it is recommended that one of the material balance methods then be used.

Section 2.3 describes a Material Balance Method of calculating emissions from the installation, operation, and disposal of refrigeration and air conditioning equipment use. This method is recommended for organizations that maintain their own equipment and requires available data on the total inventory of refrigerants at the beginning and end of the reporting period, purchases during the reporting period, and changes in total equipment refrigerant capacity. This material balance method can also be used to calculate emissions from fire suppression equipment.

Section 2.4 describes a Simplified Material Balance Method that is appropriate for entities that do not maintain and track a stock of refrigerants, and that have not retrofitted equipment to use a different refrigerant during the reporting period. This method is recommended for organizations that have contractors service their refrigerant-containing equipment. This method tracks emissions from equipment installation, operation, and disposal. The method requires data on the quantity

¹See Chapter 1 of the GHG Protocol for more on materiality and significance of emissions sources.

of refrigerant: (a) used to fill new equipment during installation, (b) used to service equipment, and (c) recovered from retiring equipment, as well as the total refrigerant capacities of new and retiring equipment. If notified in advance of the need for this information, the service contractor should be able to provide it.

2.1. Screening Method

The method relies on the use of emission factors which are equipment specific. Therefore, this protocol provides two different methods, one for refrigeration and air conditioning equipment and a second for fire suppression equipment. This method is not applicable for quantifying emissions from purchased gases.

2.1.1 Refrigeration and Air Conditioning Equipment Screening

Under this approach, an organization multiplies the amount of refrigerant in the equipment by an emission factor for the specific type of equipment and emission event. The disadvantage to using this approach is that emission factors are highly uncertain. Therefore, this method is proposed as a screening test only. Consequently, if an organization determines that emissions from refrigeration and air conditioning equipment may be significant, it is recommended that one of the other methods then be used. Estimating emissions with the Screening Method requires the following steps:

Step 1: Perform an inventory of equipment.

Determine the number and types of refrigeration and air conditioning equipment (by equipment category, see Section 3.1) including the types of refrigerant used and the total refrigerant capacity of each piece of equipment.

Step 2: Determine installation emissions.

Identify any new equipment that was installed during the reporting period and was charged on-site. Emissions from equipment that was charged at the manufacturer are not the responsibility of the reporting organization for equipment use (see Section 1.2). For each new piece of equipment, use Equation 1 to estimate emissions.

Step 3: Determine operating emissions.

This step estimates losses from equipment leaks and service losses over the life of the equipment. For all pieces of equipment, use Equation 2 to estimate emissions.

Equation 1: Estimating Emissions from Installation

$$\text{Emissions from Installation} = C_n \times (k/100)$$

where:

- C_n = amount of refrigerant charged into the new piece of equipment
- k = assembly losses in percent of amount charged

Equation 2: Estimating Emissions from Operation

$$\text{Emissions from Operation} = C \times (x/100) \times T$$

where:

- C = refrigerant capacity of the piece of equipment
- x = annual leak rate in percent of capacity
- T = time in years used during the reporting period (e.g., 0.5 if used only during half of the reporting period and then disposed)

Step 4: Determine disposal emissions.

Identify any pieces of equipment that were disposed of during the reporting period. For each piece of disposed equipment, use Equation 3 to estimate emissions.

Step 5: Determine total emissions.

Add the emissions from each piece of equipment for each type of emission (installation, operation, and disposal) to get total emissions. Calculate separate totals for each type of refrigerant used. Multiply the emissions of each refrigerant by the refrigerant's GWP from Table 1 or Table 2 to calculate CO₂ equivalent emissions.

Section 3.1 provides default emission factors and describes the different categories of equipment for which there are default factors.

Equation 3: Estimating Emissions from Disposal

Emissions from Disposal =

$$CD \times (y/100) \times (1 - z/100)$$

where:

CD = refrigerant capacity of the piece of equipment being disposed of

y = percent of the capacity remaining at disposal

z = percent of refrigerant recovered

2.1.2 Fire Suppression Equipment Screening

Fire suppression equipment can be divided into two broad categories, fixed and portable equipment. This Screening Method provides an emission factor for each type of equipment. Under this approach, the organization multiplies the capacity of the equipment by an emission factor for fixed or portable equipment. If an organization determines that emissions from fire suppression equipment may be significant, it is recommended that one of the other methods then be used. Estimating emissions with the Screening Method requires the following steps:

Step 1: Perform an inventory of equipment.

Determine the number and types of fire suppression equipment, by gas type, and the fire suppressant capacity of each piece of equipment.

Step 2: Determine total emissions.

Add the capacities of each portable unit for each gas and of each fixed unit for each gas and multiply the total capacity by the appropriate emission factor. Emissions from fixed systems are assumed to be 2.5 percent (0.025) of the total capacity of the units for each gas. Emissions from portable equipment are assumed to be 3.5 percent (0.035) of the total capacity of the units for each gas. The emission factors provided for this Screening Method are as provided in the Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2012. Multiply the emissions of each fire suppressant by its GWP from Table 1 or Table 2 to calculate CO₂ equivalent emissions.

2.2. Method for Purchased Gases

Industrial gases are sometimes used in processes such as manufacturing, testing, or laboratory uses. For example, CO₂ gas is often used in welding operations. These gases are typically released to the atmosphere after use. Any use and release of the seven major GHGs (CO₂, CH₄, N₂O, PFCs, HFCs, SF₆, and NF₃) is required to be included in the GHG inventory.

Step 1: Determine purchases of industrial gases.

Determine whether any GHGs are used in processes such as those mentioned above. If so, collect the mass of each gas purchased. If data are not available in mass units, the organization may need to convert from volume to mass using the density of the specific gas. It is assumed that all gas purchased in the reporting period is used and released during the reporting period. If the organization makes a bulk purchase and plans on using the gas over multiple years, divide the bulk amount by the expected years of usage and consider that to be the purchase amount for the current reporting period, as well as the applicable future reporting periods.

Step 2: Calculate emissions.

Sum the amount of gas purchased for each gas type. Multiply the total by the appropriate GWP from Table 1 or Table 2 to calculate CO₂ equivalent emissions.

2.3. Material Balance Method

The Material Balance Method tracks emissions of refrigerants² from equipment through a mass balance analysis. Releases of refrigerants can be calculated based on the inventory (in storage, not in operating equipment), purchases and sales of refrigerants, as well as changes in total refrigerant capacity of equipment during the emissions reporting period. The inventory should be tracked at the facility level by type of refrigerant. Equation 4 shows the basic principles involved in this approach.

Equation 4 can be rewritten to more easily calculate emissions as shown in Equation 5.

Equation 5 should be applied to each type of refrigerant used. Calculating emissions with the Material Balance Method requires the following steps for each type of refrigerant:

Step 1: Calculate the change in inventory ($I_b - I_e$).

Subtract the amount of refrigerant in inventory at the end of the reporting period from the amount

Equation 4: Material Balance of Refrigerant

$$I_b + P + C_b = I_e + S + C_e + \text{Emissions}$$

where:

I_b = refrigerant in inventory (in storage, not in operating equipment) at the beginning of reporting period

P = refrigerant purchased or otherwise acquired during the reporting period

C_b = total refrigerant capacity of equipment at the beginning of the reporting period

I_e = refrigerant in inventory (in storage, not in operating equipment) at the end of reporting period

S = refrigerant sold or otherwise disposed of during the reporting period

C_e = total refrigerant capacity of equipment at the end of the reporting period

Equation 5: Calculating Refrigerant Emissions with the Material Balance Method

$$\text{Emissions} = (I_b - I_e) + P - S + (C_b - C_e)$$

²The term "refrigerant" is used in this section, but this method can also apply to fire suppressants or industrial gases.

in inventory at the beginning of the reporting period to calculate the change in inventory. The inventory of refrigerants is defined as the total stored on site in cylinders or other storage. This does not include refrigerants contained within equipment.

Step 2: Determine purchases and other acquisitions (P).

Purchases and other acquisitions may include refrigerant: (a) purchased from producers or distributors, (b) provided by manufacturers with or inside equipment, (c) added to equipment by contractors or other service personnel (but not if that refrigerant is from the organization's inventory), and (d) returned after off-site recycling or reclamation.

Step 3: Determine sales and disbursements (S).

Sales and disbursements may include refrigerant: (a) in containers or left in equipment that is sold or disposed of, (b) returned to suppliers, and (c) sent off-site for recycling, reclamation, or destruction. The amount of refrigerant left in equipment should be the actual amount, which may be less than the total capacity.

Step 4: Calculate the change in capacity ($C_e - C_b$).

The change in capacity is the net change to the total equipment volume for a given refrigerant during the reporting period. Note that "total capacity" refers to the full and proper charge of the equipment rather than the actual charge, which may reflect leakage. Because the material balance is performed for each refrigerant individually, retrofitting of equipment to use a different refrigerant will represent a change in capacity for the old and the new refrigerant. If the beginning and ending total capacity values are not known, the change in capacity can be calculated based on the capacities of known installations and disposals of equipment. If an organization only installs equipment during the reporting period, C_e will be greater than C_b . The reverse is true for an organization that only disposes of equipment during the reporting period.

Step 5: Calculate emissions.

Once the previous four steps have been completed, GHG emissions for each type of refrigerant and blend may be quantified using Equation 5. Multiply the emissions of each refrigerant by the refrigerant's GWP from Table 1 or Table 2 to calculate CO₂ equivalent emissions.

Section 3.3 describes in more detail the type of data that is used in determining emissions.

It may be illustrative to describe how the installation or disposal of equipment impacts the Material Balance Method's calculation. If equipment is installed, the refrigerant capacity of that equipment is included in both term P as an acquisition and in term C_e as capacity at the end of the year. As a result, the installation has no net impact on emissions.

If equipment is disposed, the refrigerant capacity of that equipment is included in term C_b , as capacity at the beginning of the year, and the actual amount of refrigerant contained in the equipment upon disposal is included in term S as a disposition. If the amount of refrigerant contained in the equipment upon disposal equals its refrigerant capacity, the disposal will have no net impact on emissions. If the actual amount is less than the capacity, the difference is assumed to represent emissions.

2.4. Simplified Material Balance Method

The Simplified Material Balance Method is a simplified version of the Material Balance Method described above. In the simplified method, there are fewer flows of refrigerant³ to consider. This method is appropriate for entities that do not maintain and track a stock of refrigerants, and that have not retrofitted equipment to use a different refrigerant during the reporting period. This method requires information on the quantity of refrigerant: (a) used to fill any new equipment installed during the reporting period, (b) used to service equipment, and (c) recovered from any equipment retired during the reporting period. It also requires information on the total refrigerant capacity of installed and retired equipment. This method can be summarized by Equation 6.

Equation 6 should be applied to each type of refrigerant used. Calculating emissions with the Simplified Material Balance Method requires the following steps for each type of refrigerant:

Step 1: Calculate installation emissions ($P_N - C_N$).

This step is only necessary if the reporting entity installed any new equipment during the reporting period that was not pre-charged by the equipment supplier. Emissions are calculated by taking the difference between the amount of refrigerant used to charge the equipment and the total capacity of the equipment. The difference is assumed to represent emissions.

Step 2: Determine operating emissions (P_S).

Operating emissions result from equipment leaks and service losses. It is assumed that the amount of refrigerant purchased to service equipment is replacing the same amount that was emitted during operation.

Step 3: Calculate disposal emissions ($C_D - R_D$).

This step is only necessary if the organization disposed of equipment during the reporting period. Emissions are calculated by taking the difference between the total capacity of the equipment disposed and the amount of refrigerant recovered. The difference is assumed to represent emissions.

Step 4: Calculate emissions.

Emissions for each type of refrigerant and blend are calculated by summing the results of the first three steps. Multiply the emissions of each refrigerant by the refrigerant's GWP from Table 1 or Table 2 to calculate CO₂ equivalent emissions.

Section 3.3 describes in more detail the type of data that is used in determining emissions.

Equation 6: Calculating Refrigerant Emissions with the Simplified Material Balance Method

$$\text{Emissions} = (P_N - C_N) + P_S + (C_D - R_D)$$

where:

P_N = purchases of refrigerant used to charge new equipment (omitted if the equipment has been pre-charged by the manufacturer)

C_N = total refrigerant capacity of the new equipment (omitted if the equipment has been pre-charged by the manufacturer)

P_S = purchases of refrigerant used to service equipment

C_D = total refrigerant capacity of retiring equipment

R_D = refrigerant recovered from retiring equipment

³The term "refrigerant" is used in this section, but this method can also apply to fire suppressants or industrial gases.

Section 3: Choice of Activity and Emission Factors

Required data for all emission estimation methods can come from inventory records, purchase records, repair reports, service records, and disposal records.

3.1. Screening Method

The Screening Method requires organizations to determine the following information:

- Type of Equipment
- Number of Units
- Refrigerant or Fire Suppressant Used
- Total Refrigerant or Fire Suppressant Charge for the Equipment (lb.)

For refrigeration and air conditioning equipment, the additional information is required:

- Assembly Emission Factor (%)
- Annual Leakage Rate (%)
- Percent of Capacity Remaining at Disposal (%)
- Recovery Efficiency (%)

The Screening Method is based on the Tier 2 approach from the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories.

The IPCC guidelines also include a table of emission factors for the different phases of the equipment's life by equipment type. The IPCC table provides ranges of values for the different emission factors, the percent remaining at disposal, and the recovery efficiency. However, since this method is intended as a screening approach, it is recommended that the upper end of the ranges be used. These values are provided in Table 3. The ranges in capacity are provided only for reference; organizations should use the actual capacity of their equipment.

Table 3: Default Emission Factors for Refrigeration/Air Conditioning Equipment

Type of Equipment	Capacity (kg)	Installation Emission Factor	Operating Emissions	Refrigerant Remaining at Disposal	Recovery Efficiency
		k (% of capacity)	x (% of capacity/yr.)	y (% of capacity)	z (% of remaining)
Domestic Refrigeration	0.05–0.5	1	0.5	80	70
Stand-alone Commercial Applications	0.2–6	3	15	80	70
Medium & Large Commercial Refrigeration	50–2,000	3	35	100	70
Transport Refrigeration	3–8	1	50	50	70
Industrial Refrigeration including Food Processing and Cold Storage	10–10,000	3	25	100	90
Chillers	10–2,000	1	15	100	95
Residential and Commercial A/C including Heat Pumps	0.5–100	1	10	80	80
Mobile Air Conditioning	0.5–1.5	0.5	20	50	50

Source: 2006 IPCC Guidelines for National Greenhouse Gas Inventories

3.2. Method for Purchased Gases

For quantifying emissions from purchased gases, this method requires data that should be available from purchase records. The Method for Purchased Gases requires organizations to collect the following data:

- Type of gas purchased
- Amount of gas purchased
- Purpose for the gas

3.3. Material Balance Method

The recommended approach for organizations that maintain their own refrigerant-containing equipment is to calculate emissions based on the Material Balance Method. This method requires data that should be available from purchase and service records. The Material Balance Method requires organizations to collect the following data:

- Refrigerant inventory (in storage, not in operating equipment) at beginning of year
- Refrigerant inventory (in storage, not in operating equipment) at end of year
- Refrigerant purchased from producers or distributors in bulk
- Refrigerant provided by manufacturers with or inside of equipment
- Refrigerant added to equipment by contractors

- Refrigerant returned after off-site recycling or reclamation
- Sales of bulk refrigerant to other entities
- Refrigerant left in equipment that is sold to other entities or disposed of
- Refrigerant returned to suppliers
- Refrigerant sent off-site for recycling or reclamation
- Refrigerant sent off-site for destruction
- Refrigerant capacity at beginning of year (in operating equipment, not storage)
- Refrigerant capacity at end of year (in operating equipment, not storage)

If beginning and ending capacity values are not known then the following information can be used:

- Refrigerant capacity of new equipment using this refrigerant
- Refrigerant capacity of equipment that is retrofitted to use this refrigerant
- Refrigerant capacity of retiring or sold equipment that used this refrigerant
- Refrigerant capacity of equipment that is retrofitted away from this refrigerant to a different refrigerant

Note: "Refrigerant capacity" refers to the full and proper charge of the equipment rather than to the actual charge, which may reflect leakage.

3.4. Simplified Material Balance Method

The Simplified Material Balance Method is the recommended approach for equipment users who have contractors service their equipment. If notified in advance of the need for this information, the contractor should be able to provide it. This method requires organizations to collect the following data:

- Refrigerant used to fill new equipment
- Refrigerant purchased to charge new equipment
- Refrigerant capacity of new equipment using this refrigerant
- Refrigerant purchased to service equipment
- Refrigerant capacity of retiring equipment
- Refrigerant recovered from retiring equipment

Note: "Refrigerant capacity" refers to the full and proper charge of the equipment rather than to the actual charge, which may reflect leakage.

Section 4: Completeness

In order for an organization's GHG inventory to be complete, it must include all emission sources within the organization's inventory boundaries. See Chapter 3 of the GHG Protocol for detailed guidance on setting organizational boundaries and Chapter 4 of the GHG Protocol for detailed guidance on setting operational boundaries of the inventory.

On an organizational level, an organization's inventory should include emissions from all applicable facilities or fleets of vehicles. Completeness of organization-wide emissions can be checked by comparing the list of sources included in the GHG emissions inventory with those included in other emission's inventories, environmental reporting, financial reporting, etc.

At the operational level, an organization should include all GHG emissions from the sources included in their GHG inventory. Possible GHG emission sources are stationary fuel combustion, combustion of fuels in mobile sources, purchases of electricity, and process or fugitive emissions. Organizations may refer to this guidance document for calculating fugitive GHG emissions from air conditioning and refrigeration equipment, as well as fire suppression equipment and industrial gases, and to the Center's Guidance documents for calculating emissions from other sources.

When calculating emissions from this equipment use, organizations should include all applicable sources of refrigerant emissions. If a third party is used for any component of refrigerant tracking, the third party should provide any necessary information. For the Screening Method, all pieces of equipment of all different types need to be accounted for. For the Material Balance Methods, all activities and different types of refrigerants or blends should be tracked.

As described in Chapter 1 of the GHG Protocol there is no materiality threshold set for reporting emissions. The materiality of a source can only be established after it has been assessed. This does not necessarily require a rigorous quantification of all sources, but at a minimum, an estimate based on available data should be developed for all sources.

Section 5: Uncertainty Assessment

There is uncertainty associated with all methods of calculating GHG emissions.

EPA does not recommend organizations quantify uncertainty as +/- % of emissions or in terms of data quality indicators. The effort spent to perform such analysis would be better spent pursuing high quality inventory data.

It is recommended that organizations identify the areas of uncertainty in their emissions calculations and make an attempt to use the most accurate data possible or conservative values when performing a screening analysis. As mentioned, the Screening Method for estimating emissions is highly uncertain. Factors vary between individual pieces of equipment and also over time. Even if the amount of refrigerant added to a particular piece of equipment has been tracked carefully, allowing the previous leak rate of that equipment to be established, that leak rate can change after the leak is repaired or as the equipment ages.

The major uncertainty introduced in the material balance approaches occurs with recently installed equipment. Equipment can leak for two or more years before needing a recharge, so emissions over this period are not detected until after they occur. Despite this minor drawback, the material balance approaches provide a highly accurate estimate of emissions.

Section 6: Documentation

In order to ensure that emissions calculations are transparent and verifiable, the documentation sources listed in Table 4 should be maintained. These documentation sources should be collected to ensure the accuracy and transparency of the related emissions data, and should also be included in the organization's Inventory Management Plan (IMP).

Table 4: Documentation Sources

Data	Documentation Source
Inventory at Beginning and End of Year	Stock Inventory documentation
Purchases	Purchase receipts; delivery receipts; contract purchase
Nameplate Capacity of Equipment	Delivery receipts of equipment; records of physical inspection of nameplates; shipping or disposal records of equipment
Amounts Charged to Equipment	Repair records; repair invoices; daily reports
Amounts Recovered from Equipment	Repair records; repair invoices; daily reports; disposal records

Section 7: Inventory Quality Assurance and Quality Control (QA/QC)

Chapter 7 of the GHG Protocol provides general guidelines for implementing a QA/QC process for all emissions calculations. For the use of refrigeration and air conditioning equipment, the following items must be addressed:

- Care should be taken that releases are not double-counted (e.g., from reporting both refrigerant blend and individual blend component use).
- Verify that your inventory is complete. Because the GWPs of fluorinated compounds are so large (particularly when compared to carbon dioxide and methane), failure to account for even relatively small releases of fluorinated compounds can introduce significant errors. Also, tracking specific GHGs separately is important, because of the differing GWPs.

FORM 2 - Annual GreenChill Installed Refrigerant and Emissions Corporate Report

~ Confidential Business Information ~



GreenChill Installed Refrigerant and Emissions Corporate Report for Food Retail Partners

I. General Partner Information

Company Name:	This Reporting Year:	Number of Stores:	Partner Base Year*
	2015		

* Selected by the Partner - Partner may select the first reporting year or up to two years prior to the first reporting year.

Provide this data aggregated across all stores.

II. Corporate-Wide Installed Refrigerant

Note: Report aggregate information for all retail stores under the same Partner and/or banner name. Include offices, break rooms, etc. do located inside retail stores. Do not include separate office buildings, distribution centers, warehouses, etc. Do not include refrigerant stored in cylinders on or off site. Include other refrigerants not listed by using extra lines at the bottom of the table.

Refrigerant	Commercial Refrigeration		Air-Conditioning
	Charge > 50 Pounds	Charge < 50 Pounds	
	REQUIRED	OPTIONAL	OPTIONAL
EP-88			
R-12			
R-123			
R-13			
R-134a			
R-143A			
R-22			
R-23			
R-290 (Propane)			
R-401A (MP 39)			
R-401B (MP 66)			
R-402A (HP 60)			
R-402B (HP 61)			
R-404A (HP 62)			
R-407A (Ilea 60)			
R-407C (Ilea 66; Suva 9000)			
R-407F (Gen. Performax LT)			
R-408A (FX-10)			
R-409A (FX-56)			
R-410A (AZ-20, Puron)			
R-414A (GHG-X4)			
R-414B (Hot Shot)			
R-416A (FR 12)			
R-417A (NU-22, Isecon MO29)			
R-421A (Choice R421A)			
R-422A (Isecon 79)			
R-422B (XAC1)			
R-422C (XLT1)			
R-422D (Isecon MO29)			
R-427A (Forane 427A)			
R-437A (SCEON MO49 Plus)			
R-438A (SCEON MO99)			
R-441A (HC blend)			
R-448A (Solstice N-40)			
R-449A (Opteon XP 40)			
R-450A (Solstice N-13)			
R-502			
R-507A (AZ-50)			
R-513A (Opteon XP 10)			
R-600a (Isobutane)			
R-717 (NH3)			
R-744 (CO2)			
(INSERT OTHER)			
(INSERT OTHER)			
(INSERT OTHER)			
(INSERT OTHER)			
(INSERT OTHER)			
(INSERT OTHER)			
(INSERT OTHER)			
Total	0	0	0

Reported values are in (select one):

Pounds

III. Corporate-Wide Refrigerant Emissions

Note: Report aggregate information for all retail stores under the same Partner and/or banner name. Include offices, break rooms, etc. do located inside retail stores. Do not include separate office buildings, distribution centers, warehouses, etc. Do not include refrigerant recovered/recycled from equipment retired, but do include known emissions from those systems. Do not include first-fill charging when installing new systems or after ramloads. Include other refrigerants not listed by using extra lines at the bottom of the table.

Refrigerant	Commercial Refrigeration		Air-Conditioning
	Charge > 50 Pounds	Charge < 50 Pounds	
	REQUIRED	OPTIONAL	OPTIONAL
EP-88			
R-12			
R-123			
R-13			
R-134a			
R-143A			
R-22			
R-23			
R-290 (Propane)			
R-401A (MP 39)			
R-401B (MP 66)			
R-402A (HP 60)			
R-402B (HP 61)			
R-404A (HP 62)			
R-407A (Ilea 60)			
R-407C (Ilea 66; Suva 9000)			
R-407F (Gen. Performax LT)			
R-408A (FX-10)			
R-409A (FX-56)			
R-410A (AZ-20, Puron)			
R-414A (GHG-X4)			
R-414B (Hot Shot)			
R-416A (FR 12)			
R-417A (NU-22, Isecon MO29)			
R-421A (Choice R421A)			
R-422A (Isecon 79)			
R-422B (XAC1)			
R-422C (XLT1)			
R-422D (Isecon MO29)			
R-427A (Forane 427A)			
R-437A (SCEON MO49 Plus)			
R-438A (SCEON MO99)			
R-441A (HC blend)			
R-448A (Solstice N-40)			
R-449A (Opteon XP 40)			
R-450A (Solstice N-13)			
R-502			
R-507A (AZ-50)			
R-513A (Opteon XP 10)			
R-600a (Isobutane)			
R-717 (NH3)			
R-744 (CO2)			
(INSERT OTHER)			
(INSERT OTHER)			
(INSERT OTHER)			
(INSERT OTHER)			
(INSERT OTHER)			
(INSERT OTHER)			
Total	0	0	0

Reported values are in:

Pounds

"I certify with my signature that the data reported herein represent the Reporting Party's best estimates and are the result of a good faith effort to obtain and report accurate information."

Signature: _____

Date: _____

Name (please print): _____

Please return completed forms by **March 31, 2016** by email or fax to:

Joe Donahue, Abt Associates
Joe_Donahue@abtassoc.com
 Phone: 202-637-6235

You may also send a copy of completed forms by email to EPA:

Tom Land, EPA GreenChill Partnership
land.tom@epa.gov
 Phone: 202-943-9183

The public reporting and recordkeeping burden for this collection of information is estimated to average [0X hours] per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.



GreenChill Installed Refrigerant and Emissions Corporate Report for Food Retail Partners

I. General Partner Information

Company Name: _____ This Reporting Year: 2015 Number of Stores: _____ Partner Base Year* _____

Provide this data aggregated across all stores.

II. Corporate-Wide Installed Refrigerant

Note: Report aggregate information for all retail stores under the same Partner and/or banner name. Include offices, break-rooms, etc. co-located inside retail stores. Do not include separate office buildings, distribution centers, warehouses, etc. Do not include refrigerant stored in cylinders on or off site. Include other refrigerants not listed by using extra lines at the bottom of the table.

Table with columns: Refrigerant, Commercial Refrigeration (Charge > 50 Pounds, Charge < 50 Pounds), Air-Conditioning (OPTIONAL). Lists various refrigerant types like EP-88, R-12, R-123, etc.

Reported values are in (select one):

Pounds

III. Corporate-Wide Refrigerant Emissions

Note: Report aggregate information for all retail stores under the same Partner and/or banner name. Include offices, break-rooms, etc. co-located inside retail stores. Do not include refrigerant recovered/recycled from equipment retired, but do include known emissions from those systems. Do not include first-fill charging when installing new systems or after remodel. Include other refrigerants not listed by using extra lines at the bottom of the table.

Table with columns: Refrigerant, Commercial Refrigeration (Charge > 50 Pounds, Charge < 50 Pounds), Air-Conditioning (OPTIONAL). Lists various refrigerant types like EP-88, R-12, R-123, etc.

Reported values are in:

Pounds

"I certify with my signature that the data reported herein represent the Reporting Party's best estimates and are the result of a good faith effort to obtain and report accurate information."

Signature: _____

Date: _____

Name (please print): _____

Please return completed forms by March 31, 2016 by email or fax to:

Joe Donahue, Aiot Associates
joe_donahue@aiotassoc.com
Phone: 202-457-6335

You may also send a copy of completed forms by email to EPA:

Tom Lendi, EPA GreenChill Partnership
tlen@epamail.epa.gov
Phone: 202-343-9182

The public reporting and recordkeeping burden for this collection of information is estimated to average 30x hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

OPTIONAL TEMPLATE 3- Fictitious Example of a Refrigerant Management Plan

Suggested Template - Partners Are Not Required to Complete This Document

-- EXAMPLE -- Corporate Refrigerant Management Plan GreenChill Partners

Supermarket	Curly-Cue Supermarkets
Year	2015

Each GreenChill Partner is required to submit an annual corporate refrigerant management plan. GreenChill uses the information “qualitatively” to help determine GreenChill projects for the coming year. Partners are not evaluated based on information in their plans. Although there is no standard form for the plan, this two-part template provides a suggested format Partners are welcome to use.

- Part 1: a suggested format for identifying emissions rate goal(s) for the present year. Partners are not required to use this format. They must provide an emissions rate goal.
- Part 2: a suggested format for the refrigerant management plan. Partners must describe their refrigerant management activities and how they plan to reach their emissions rate goal(s).

Part 1. Emissions Rate Goals

Partners are required to submit an emissions rate goal for the present year, for commercial systems with 50 or more pounds of refrigerant. Partners are encouraged (but not required) to also set a more aggressive “stretch” goal, for which they can receive a second award. Table 1 presents a suggested format for identifying emissions rate goal(s).

REMINDER: To be eligible for GreenChill goal achievement awards, Partners’ goal(s) for the present year must be lower than their emissions rate from the previous year.

Table 1. Past goals and emissions rates for commercial systems with more than 50 pounds of refrigerant.

Year	Goal (Required)	Stretch Goal (Optional)	Emissions Rate
2008 (Baseline Year)	Not applicable	Not applicable	16%
2009	10%	None identified	12%
2010	10%	None identified	10%
2011	9.1%	None identified	9%
2012	8.5%	None identified	8.5%
2013	8.25%	8%	8.2%
2014	8%	7.5%	8%
2015	7.5%	7.25%	7.25%*
2016	7.0%	6.9%	**

* The emissions rate for the most recent past year should be from the GreenChill data reporting form.
 ** The emissions rate for the present year will be calculated next year.

Part 2. Corporate Refrigerant Management Plan

Partners are welcome to use the following structure to organize their refrigerant management plan for the present year.

REMINDER: Partners do not need to address all the topics listed below; it is understood that not all topics will be relevant to each Partner.

A. Review of Previous Year's Goal(s) and Achievements (suggested topics, complete relevant ones)
What went well last year?
In 2014, we achieved our goal, but missed our stretch goal by 0.5%. Our achievement was a result of the acceleration of our "leak tightness" strategy to make up for our losses due to catastrophic equipment failures in previous years. All potentially faulty components were replaced in all our stores (not just the ones that failed), and as a result, we got back on track in 2015 and achieved our goal. As we continue to reduce our refrigerant emissions, we feel it is necessary to become more conservative in our goals. We hope to achieve a reduction in our emissions rate to 7.0% in 2016. Our stretch goal for 2016 is 6.9%.
What did not go well last year? How will these challenges be addressed in the present year?
What were the key factors that helped you meet (or prevented you from meeting) your goal(s) for the year?
Other notes

B. Leak Prevention and Repair (suggested topics, complete relevant ones)
Installation of leak detection systems
We are installing better leak sensors in the machine rooms in an additional 600 stores (new leak detectors installed in 600 stores in every year from 2006-2015).
Leak prevention or charge reducing system components
Regular leak prevention maintenance program
Use of GreenChill's Leak Prevention and Repair Guideline
Use of GreenChill's Maintenance for Leak Prevention Fact Sheet
Rapid leak response protocol
We have a rapid response system that ensures that a technician responds to a leak in any stores within 7 minutes of the notification.
Leak repair verification requirements
We require verification from our service technicians that every leak was fixed and then require re-verification after 30 minutes of regular system operation.
Other notes

C. Store Remodels or Retrofits (suggested topics, complete relevant ones)
Number of remodels or retrofits planned
Curly-Cue Supermarkets has discontinued our R-22 store retrofits to HFC refrigerants. All stores have been converted.
Refrigerants involved (e.g., retrofitted in and out)
Systems involved (e.g., retrofitted in and out)
Use of GreenChill's Installation Leak Tightness Guidelines <u>or</u> GreenChill's Retrofit Guidelines
Remodeled or retrofitted system design features (e.g., for reduced charge and leak potential)
Estimated charge size for remodeled or retrofitted systems
Estimated leak rate for remodeled or retrofitted systems
Other notes
D. Newly Designed Stores (suggested topics, complete relevant ones)
Number of new stores opening
We are opening 20 new stores throughout 2016. All new stores will use non-ODS refrigerants for A/C, commercial refrigeration, and self-contained equipment.
Refrigerants involved
We are considering adopting a policy of using only climate-friendly refrigerants in all new stores.
Refrigeration systems involved
<ul style="list-style-type: none"> • Of the 20 new stores we are building in 2016, 16 of them will be standard DX refrigeration systems. • Of the 20 new stores we are building in 2016, 2 of them will be secondary loop stores. • Of the 20 new stores we are building in 2016, 2 of them will be distributed system stores.
New system design features (e.g., for reduced charge and leak potential)
<p>We will achieve lower refrigerant charges by using:</p> <ul style="list-style-type: none"> • Compressor type A instead of compressor type B • Piping configuration X • Receiver X • Sub-cooling • Line size diameters of y (used to be x) <p>When building new stores, we ensure reduced leak potential by planning:</p> <ul style="list-style-type: none"> • Less Pipe Surface area - x footage vs. y footage in a regular store • Less Pipe footage - x footage vs. y footage in a regular store • Fewer Solder Joints - 34 joints vs. 76 in other stores • Fewer components - reduces leaks by doing x • Better piping supports - we are using x brand piping supports, which do y.
Use of GreenChill's Installation Leak Tightness Guidelines
All new stores will GreenChill's installation leak tightness standards as described in the GreenChill Leak Tightness Installation Guideline. The refrigeration systems for all new DX stores are currently tested for leak tightness at installation. We have adopted GreenChill's Installation Leak Tightness Best Practices Guidelines as our company spec, and all service technicians are required to follow the Guidelines and have the results of the GreenChill Leak Tightness Testing verified by a Supervisory

Maintenance Manager before declaring the work complete.
Estimated charge size for new systems
<p><u>New DX Stores</u> Curly-Cue's goal is to reduce the refrigerant charge in all new DX stores from an average of 4500 lbs. of refrigerant to 3000 lbs of refrigerant.</p> <p><u>New Secondary Loop stores</u> Our goal is to reduce our refrigerant charge in all new secondary loop stores down to an average of 1000 lbs. per store, vs. 3000-4500 lbs in our DX systems.</p> <p><u>New Distributed System stores</u> The stores that use distributed systems will have a refrigerant charge of 2000 lbs., as opposed to our DX stores that have a charge that ranges from 3000-4500 lbs of refrigerant.</p>
Estimated leak rate for new systems
<p><u>New DX Stores</u> In the 800 new DX stores we built from 2006-2015 using these steps, we have consistently achieved and maintained annual leak rates below 10%.</p> <p><u>New Secondary Loop stores</u> We estimate that our stores that use secondary loop systems will have leak rates of less than 5%.</p> <p><u>New Distributed System stores</u> We estimate that our stores that use a distributed refrigeration system will have leak rates of less than 10%.</p>
Other notes

E. GreenChill Certification (suggested topics, complete relevant ones)
Plans for achieving certification or re-certification in existing stores
Plans for achieving certification in new/future stores
Other notes

F. Store Turnover (suggested topics, complete relevant ones)
Number of stores to be <u>acquired</u>
Refrigerants and systems used in stores to be acquired
Number of stores to be <u>closed</u>
Refrigerants and systems used in stores to be closed

Other notes

G. Technician and Contractor Coordination (suggested topics, complete relevant ones)
Technician training on leak prevention and refrigerant management
Technician/contractor performance tracking and incentive programs
Contract specifications for GreenChill best practices
Other notes

H. Refrigerant Use Tracking (suggested topics, complete relevant ones)
Refrigerant tracking tools/software
Refrigerant banking
Other notes

I. Evaluation and Communications (suggested topics, complete relevant ones)
Estimating impacts of refrigerant leaks (e.g., using GreenChill's Financial Impact Calculator)
Communicating to management about importance of leak prevention and refrigerant management
Other notes

INSTRUCTIONS 4 – Introduction to Store Certification Program

<http://www.epa.gov/greenchill/greenchill-store-certificati>

GreenChill Store Certification Program

GreenChill's Store Certification Program for Food Retailers recognizes individual stores for using environmentally friendlier commercial refrigeration systems. A food retail store can achieve platinum-, gold-, or silver-level certification. Any food retail store in the United States, whether in the design phase, remodel phase, newly constructed, or fully operational, can apply for GreenChill's Store Certification Award. The process is free, quick, and easy.

[GreenChill Store Certification Program Fact Sheet](#)

How to Certify your Store:

Step 1: Select the appropriate application form for the store in question.

If the store is not yet operational, or if it has been operational for less than 6 months, fill out the "Newly Constructed Stores" form. If the store has been in operation for at least 12 months, fill out the "Operational Stores" form. If the store has been in operation for 6-12 months, or if the store is a remodeled store, please contact [Tom Land](#) (202-343-9185) to determine which form needs to be filled out. For newly constructed stores, an installation leak tightness testing verification form, as provided below, must also be completed and signed.


- [GreenChill Certification Form: Newly Constructed Stores](#) (2 pp, 131 K)
- [Installation Leak Tightness Testing Verification Form \(Microsoft Word Document\)](#) (1 pg, 236 K)
- [GreenChill Certification Form: Operational Stores \(Microsoft Word Document\)](#) (2 pp, 222 K)
- [GreenChill Recertification Form \(Microsoft Word Document\)](#) (2 pp, 222 K)

Step 2: Complete the Application Form

The application form is only two sides and is quick and easy to complete. For guidance on completing the application, please refer to the materials listed below.

Certified Stores

[View a List of Currently Certified Stores](#)



http://www.epa.gov/greenchill/greenchill-store-certificati... One EPA Workplace Outlook.com - thomasland@... GreenChill Store Certificati... x

File Edit View Favorites Tools Help

US EPA EZ Tech Hardware Refresh... AMP by Strathmore - Live... Sign In 7-Day Forecast for Latitud... GreenChill US EPA My Workplace Project Pa... EASY Lite DWCMS Log In US EPA Login

Step 2: Complete the Application Form

The application form is only two sides and is quick and easy to complete. For guidance on completing the application, please refer to the materials listed below.

- [GreenChill Store Certification Criteria](#)
- [GreenChill Store Certification Program Guidance](#)
- [GreenChill Installation Leak Tightness Guidelines](#)
- [GreenChill Store Certification Protocol for Combined Systems](#)
- [GreenChill Store Certification Protocol for Separate Sub-Cooling Racks](#)
- [GreenChill Store Certification Protocol for Prep Room Refrigeration](#)
- [GreenChill Store Certification Protocol for a Refrigeration Rack with an AC Load](#)
- [GreenChill Store Certification Protocol for Condensing Units](#)

Step 3: Send in your application.

The application and all required attachments should be sent to [Tom Land](#).

Step 4: Await notification from EPA.

Once your application is received, EPA will send an email confirming receipt and will immediately begin the review process. Please let us know if receipt of our decision is time sensitive and we will do everything we can to adhere to your needs. After a decision is made, EPA will notify you via email. Please note that GreenChill reserves the right to deny store certification based on a company's Clean Air Act Title 6 enforcement issues.

** If you do not receive an email confirmation within 2 business days, please notify EPA.*

Step 5: Your Store Certification

If your store achieves certification, you will receive a silver, gold, or platinum certificate from EPA, along with press release guidance and an order form for a plaque. You may purchase as many plaques as you wish. GreenChill Store Certification is valid for one year. After one year, stores must reapply to retain GreenChill Certification. *Note: When referring to any EPA Award, please include the year in which the award was received.*

Contact Us to ask a question, provide feedback, or report a problem.

100%

INSTRUCTIONS 4 – Store Certification Criteria

The GreenChill Advanced Refrigeration Partnership



GreenChill Store Certification Criteria

The following document summarizes the requirements to achieve Platinum-, Gold- and Silver-Level Certification. Please see the [GreenChill Store Certification Program Guidance](#) for more information on each criterion.

Platinum-Level Store Certification: To qualify for GreenChill's Platinum-Level Store Certification, a store must meet the requirements under either A or B:

A. HFC-Based Refrigeration Systems

- The store must only use refrigerants with zero ozone-depleting potential;
- The store must only use refrigerants that have been found acceptable by EPA's Significant New Alternatives Policy (SNAP) Program for use in retail food refrigeration end-uses;
- The store must achieve an average HFC refrigerant charge equal to or less than 0.5 lbs. of HFC refrigerant per MBTU/hr. total evaporator heat load;
- The store must achieve a store-wide annual HFC refrigerant emissions rate of 5% or less; and
- All newly constructed stores must also be leak tested at installation according to the standards in [GreenChill's Installation Leak Tightness Testing Guidelines](#).

B. Refrigeration Systems using Low-GWP Refrigerants

- The store must only use refrigerants with zero ozone-depleting potential;
- The store must only use refrigerants that have been found acceptable by EPA's SNAP Program for use in retail food refrigeration end-uses; and
- All refrigerants used in the store's commercial refrigeration system must have a global warming potential (GWP) lower than 150.

Gold-Level Store Certification: To qualify for GreenChill's Gold-Level Store Certification, a store must meet the following requirements:

- The store must only use refrigerants with zero ozone-depleting potential;
- The store must only use refrigerants that have been found acceptable by EPA's SNAP Program for use in retail food refrigeration end-uses;
- The store must achieve an average HFC refrigerant charge equal to or less than 1.25 lbs. of refrigerant per MBTU/hr. total evaporator heat load;

- 1 -

- The store must achieve a store-wide annual HFC refrigerant emissions rate of 15% or less; and
- All newly constructed stores must also be leak tested at installation according to the standards in [GreenChill's Installation Leak Tightness Testing Guidelines](#).

Silver-Level Store Certification: To qualify for GreenChill's Silver-Level Store Certification, a store must meet the following requirements:

- The store must only use refrigerants with zero ozone-depleting potential;
- The store must only use refrigerants that have been found acceptable by EPA's SNAP Program for use in retail food refrigeration end-uses;
- The store must achieve an average HFC refrigerant charge equal to or less than 1.75 lbs of refrigerant per MBTU/hr. total evaporator heat load; and
- The store must achieve a store-wide annual HFC refrigerant emissions rate of 15% or less.
- All newly constructed stores must also be leak tested at installation according to the standards in [GreenChill's Installation Leak Tightness Testing Guidelines](#).

INSTRUCTIONS 4 – Store Certification Guidance

The GreenChill Advanced Refrigeration Partnership



GreenChill Store Certification Program Guidance

The following document provides guidance on meeting the GreenChill store certification requirements and completing either the [newly constructed store](#) or [operational store](#) application form.

Guidance on the Certification Program:

1. GreenChill certification is valid for one year from the date of the certification award.
2. GreenChill certification may be re-earned annually, as long as a store meets the certification criteria on an annual basis. To apply for recertification, the [recertification application form](#) may be used. A store that achieves certification for several years may receive “continued excellence” awards.
3. A store that was previously certified but is unable to meet the certification criteria for a particular year will not be re-certified for that year. The store may reapply for certification at any time after its certification has expired and will be re-certified once the store is able to meet the certification criteria. The store can continue to be re-certified for all years that it is able to meet the criteria.
4. There is **no fee to apply** for GreenChill certification. The only cost associated with GreenChill certification is the cost to order the optional platinum-level, gold-level, or silver-level plaque award. Every store awarded certification automatically receives a GreenChill certificate.
5. GreenChill reserves the right to verify the information submitted by a store for certification, including, but not limited to, inspection of the store, requesting third party certification, and/or requesting copies of store records related to the certification criteria.

Guidance on the Certification Application Forms:

Three application forms are available for stores applying for GreenChill certification; **(1) the Newly Constructed Store form (2) the Operational Store form, and (3) the Recertification form.** Stores must submit the form that is appropriate to the condition of the store at the time of application. For store *remodel* projects, please contact Tom Land at Land.Tom@epa.gov or 202-343-9185 to determine whether the newly constructed store form or the operational store form needs to be filled out.

Guidance on Meeting the Certification Requirements:

1. **Certification Criteria:** GreenChill’s decision to award a store with certification is based on several criteria, which are listed in Table 1 below. Each criterion applies to and is based on different types of refrigerant-containing equipment. For instance, the refrigerant emissions rate criteria applies to and is based solely on the store’s remote commercial refrigeration equipment, while the requirement that refrigerants be non-ozone-depleting applies to and is based on all three types of refrigerant-containing equipment in the store.

Table 1: Equipment Included in Each Certification Criterion

CERTIFICATION CRITERIA	INCLUDED EQUIPMENT		
	Self contained commercial refrigeration equipment	Remote commercial refrigeration equipment	HVAC Equipment
Refrigerant charge (lbs.)		✓	
Total load (MBTU/Hr)		✓	
Refrigerant emissions rate (lbs.)		✓	
Non-ozone-depleting refrigerant	✓	✓	✓
SNAP-approved refrigerant	✓	✓	✓
GreenChill’s Installation leak Tightness standards (newly constructed stores only)		✓	

2. **Refrigerant Charge:** A store’s refrigerant charge is the total pounds of refrigerant that are charged into a store’s commercial refrigeration equipment.
3. **Combined Systems:** If your store’s remote commercial refrigeration system is combined with your stores air conditioning system, it will not be possible to separate air conditioning emissions from commercial refrigeration emissions. It similarly will be difficult to separate air conditioning charge from commercial refrigeration charge. Please refer to the [GreenChill Store Certification Protocol for Combined Refrigeration and Air Conditioning Systems](#) for more information on how to report data for combined systems.
4. **Total Load:** A store’s total load shall include all BTUs associated with refrigeration. This includes the BTU output of all remote commercial refrigeration equipment but **SHALL NOT** include the BTU output of all self-contained commercial refrigeration equipment (i.e. soda machines, vendor supplied coolers, ice machines, refrigerators in deli areas, etc.). The total load **ALSO SHALL NOT** include sub-cooling, heat of rejection, pump heat, or any BTUs associated with air conditioning loads. *Note: The total load is not the rack rating or compressor capacity, which is typically larger than the total load.*

5. **Prep Room Refrigeration:** Sometimes it can be unclear whether BTUs used for ‘prep room refrigeration’ should be considered air conditioning or refrigeration. Please refer to the [GreenChill Store Certification Protocol for Stores with Prep Room Refrigeration](#) for more information on how to report data associated with prep room refrigeration.
6. **Separate Racks for Sub-Cooling:** Sub-cooling racks may sometimes be separate from the racks containing the commercial refrigeration equipment. Please refer to the [GreenChill Store Certification Protocol for Sub-Cooling Contained on Racks Separate from Refrigeration Equipment](#) for more information on how to report data associated with sub-cooling.
7. **Refrigerant Charge/Total Load:** GreenChill uses the store’s refrigerant charge and the store’s total load to calculate the pounds of refrigerant per MBTU/hr. Pounds of refrigerant per MBTU/hr. is calculated as follows:

$$\frac{\text{Refrigerant Charge (lbs.)}}{\text{Total load (MBTU/hr.)}} = \text{lbs. of refrigerant per MBTU/hr.}$$


8. **Annual Emissions:** Each store applying for GreenChill gold-level or silver-level certification must achieve an annual emissions rate of no more than 15% of the commercial refrigeration system’s refrigerant charge. For platinum-level certification, stores must achieve an annual emissions rate of no more than 5% of the commercial refrigeration system’s refrigerant charge. The amount of refrigerant emitted over the period of one year is equal to the amount of refrigerant lost from the store’s commercial refrigeration equipment and systems. The emissions rate is calculated as follows:

$$\frac{\text{Amount of refrigerant emitted over the period of one year}}{\text{System Refrigerant Charge}} \times 100 = \text{Annual emissions rate (\%)}$$

9. **Ozone Depletion:** As indicated in Table 1 above, all refrigerants used in the store, including the refrigerants in all types of self-contained equipment (soda machine in the break rooms, ice machines, deli refrigerators, etc.), must be non-ozone-depleting refrigerants. The most common ozone-depleting refrigerant used in supermarkets is HCFC-22. For a list of all Class I and Class II ozone-depleting refrigerants, see <http://www.epa.gov/ozone/science/ods/classone.html>
10. **Non-Ozone Depleting Alternatives:** For the list of substitute refrigerants that EPA’s SNAP Program has found to be acceptable alternatives to ozone-depleting refrigerants in commercial refrigeration, see <http://www.epa.gov/ozone/snap/refrigerants/lists/foodref.html>
11. **Leak Testing:** All newly constructed store certification applications must include verification that the commercial refrigeration system was tested for leaks according to [GreenChill’s Installation Leak Tightness Testing Guidelines](#).

Please direct any questions to Tom Land at Land.Tom@epa.gov or 202-343-9185.

FORMS 4 – Store Certification Applications – Newly Constructed, Operational, and Recertification



The GreenChill Advanced Refrigeration Partnership

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~Confidential Business Information~¹
Newly Constructed² Food Retail Stores

To qualify for GreenChill platinum-, gold-, or silver-level store certification, please answer the following questions about the store seeking certification.

1. STORE NAME (as you would like it to appear on the award certificate): _____
 STORE #: _____ DATE OF STORE OPENING: _____
 STREET ADDRESS: _____
 CITY: _____ STATE: _____ ZIP: _____

2. REFRIGERATION SYSTEM TYPE AND MANUFACTURER (check one box for the medium temperature system and list the manufacture of that system, and check one box for the low temperature system and list the manufacturer of that system)

SYSTEM TYPE	MEDIUM TEMPERATURE SYTEM		LOW TEMPERATURE SYSTEM	
	TYPE	MANUFACTURER	TYPE	MANUFACTURER
Centralized Direct Expansion Parallel Rack	<input type="checkbox"/>		<input type="checkbox"/>	
Distributed Direct Expansion	<input type="checkbox"/>		<input type="checkbox"/>	
Glycol Secondary Loop	<input type="checkbox"/>		<input type="checkbox"/>	
CO ₂ Secondary Loop	<input type="checkbox"/>		<input type="checkbox"/>	
CO ₂ Cascade	<input type="checkbox"/>		<input type="checkbox"/>	
CO ₂ Transcritical	<input type="checkbox"/>		<input type="checkbox"/>	
Other (please specify):	<input type="checkbox"/>		<input type="checkbox"/>	

3. REFRIGERANT TYPE AND CHARGE SIZE (complete the table below)

EQUIPMENT TYPE	REMOTE COMMERCIAL REFRIGERATION SYSTEM		SELF-CONTAINED EQUIPMENT*	HVAC EQUIPMENT**
	MEDIUM TEMPERATURE	LOW TEMPERATURE		
Primary Refrigerant Type				
Primary Refrigerant Charge (lbs)				
Secondary Refrigerant Type				
Secondary Refrigerant Charge (lbs)				

*Including soda machines, vendor supplied coolers, ice machines, refrigerators in dell areas, etc.
**Including "personal" AC in staff offices

4. PREDICTED HFC REFRIGERANT ANNUAL EMISSIONS (LBS): _____
 Annual emissions should be predicted for the HFC refrigerant in the remote commercial refrigeration equipment once the store is fully operational. If an HFC refrigerant is not used, this question may be left blank.

5. TOTAL REMOTE COMMERCIAL REFRIGERATION LOAD (MBTUS/HOUR): _____
DO NOT include the load from the store's HVAC system (split systems or self-contained), self-contained refrigeration equipment, sub-cooling, heat of rejection, or pump heat.

6. REQUIRED ATTACHMENTS CHECKLIST (If an HFC refrigerant is not used, Attachments C, D, and E are not required)

A. STORE'S REFRIGERATION SYSTEM LEGEND (SCHEDULE): A copy of the store's refrigeration system legend (schedule) that lists the BTU output of all remote commercial refrigeration equipment.

B. SUPPORTING DOCUMENTATION FOR REFRIGERANT CHARGE: A letter, signed by an authorized installation company representative, detailing the amount of refrigerant (lbs.) the commercial refrigeration system holds when properly charged. Due to possible leaks, invoices are not sufficient for verifying a system's charge.

C. LETTER STATING EQUIPMENT MANUFACTURER'S PREDICTED HFC ANNUAL EMISSIONS OR EMISSIONS RATE: A letter, signed by an authorized representative of each commercial refrigeration system manufacturer predicting this store's annual emissions (lbs.) or emissions rate (%) and the rationale for that prediction.

D. SUPPORTING DOCUMENTATION FOR PREDICTED HFC ANNUAL EMISSIONS OR EMISSIONS RATE:³ Documentation supporting the predicted annual emissions (lbs.) or emissions rate (%). Documentation may include any or all of the following, or any other supporting evidence deemed helpful: a list of emissions or emissions rates from other stores using the same technology as the store seeking certification; a list of emissions or emissions rates from other stores serviced by the same service technicians installing equipment in the store seeking certification; a list of special features of the store seeking certification that lead to reduced emissions and emissions rates, etc.

E. INSTALLATION LEAK TIGHTNESS TESTING VERIFICATION FORM: Please have an authorized installation company representative complete and sign the [Installation Leak Tightness Testing: Verification Form](#) to verify that he/she tested the remote commercial refrigeration system per GreenChill's Best Practices Guideline for Leak Tightness at Installation prior to the store's opening.

7. SIGNATURE/CERTIFICATION BY AUTHORIZED COMPANY REPRESENTATIVE

Please have an authorized representative of the store seeking certification sign this application to attest that all information contained is true and correct.

Name: _____ Title: _____
 Telephone: _____ Email: _____
 Signature: _____ Date: _____

8. CONTACT INFORMATION

Please provide contact information for a technical contact regarding the store certification application.

Name: _____ Title: _____
 Street Address: _____
 City: _____ State: _____ Zip: _____
 Telephone: _____ Email: _____

For assistance on completing the form, please refer to the [GreenChill Store Certification Program Guidance](#). Please direct any questions and send completed forms and attachments to Tom Land (Land.Tom@epa.gov, 202-343-9185).⁴

GreenChill reserves the right to deny store certification based on a company's Clean Air Act Title 6 enforcement issues
Note: When referring to any EPA Award, please include the year in which the award was received.

¹ All information provided will be treated as confidential business information (CBI), as stipulated under Clean Air Act provisions, and will not be divulged either to other partners or publicly.
² A newly constructed store is one that is applying for GreenChill certification before it opens to the public, so it does not have any actual refrigerant emissions data at the time of the certification application. Stores that have only been operational for a few months may also fit into this category.
³ A newly constructed store is one that is applying for GreenChill certification before it opens to the public, so it does not have any actual refrigerant emissions data at the time of the certification application. Stores that have only been operational for a few months may also fit into this category.
⁴ If you do not receive an email confirming receipt of your application within 2 business days, please notify EPA.

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D. SUPPORTING DOCUMENTATION FOR PREDICTED HFC ANNUAL EMISSIONS OR EMISSIONS RATE: *Documentation supporting the predicted annual emissions (lbs.) or emissions rate (%). Documentation may include any or all of the following, or any other supporting evidence deemed helpful: a list of emissions or emissions rates from other stores using the same technology as the store seeking certification; a list of emissions or emissions rates from other stores serviced by the same service technicians installing equipment in the store seeking certification; a list of special features of the store seeking certification that lead to reduced emissions and emissions rates, etc.*

E. INSTALLATION LEAK TIGHTNESS TESTING VERIFICATION FORM: *Please have an authorized installation company representative complete and sign the [Installation Leak Tightness Testing: Verification Form](#) to verify that he/she tested the remote commercial refrigeration system per GreenChill's Best Practices Guideline for Leak Tightness at Installation prior to the store's opening.*

7. SIGNATURE/CERTIFICATION BY AUTHORIZED COMPANY REPRESENTATIVE

Please have an authorized representative of the store seeking certification sign this application to attest that all information contained is true and correct.

Name: Title:
Telephone: Email:
Signature: Date:

8. CONTACT INFORMATION

Please provide contact information for a technical contact regarding the store certification application.

Name: Title:
Street Address:
City: State: Zip:
Telephone: Email:

For assistance on completing the form, please refer to the [GreenChill Store Certification Program Guidance](#). Please direct any questions and send completed forms and attachments to Tom Land (Land.Tom@epa.gov, 202-343-9185).³

GreenChill reserves the right to deny store certification based on a company's Clean Air Act Title 6 enforcement issues

Note: When referring to any EPA Award, please include the year in which the award was received.

End of document ■

³ If you do not receive an email confirming receipt of your application within 2 business days, please notify EPA.

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**~Confidential-Business-Information~
Fully-Operational Food-Retail Stores~**

To qualify for GreenChill platinum-, gold-, or silver-level store certification, please answer the following questions about the store seeking certification.

1. STORE NAME (as you would like it to appear on the award certificate) _____

STORE # _____ STREET ADDRESS _____

CITY _____ STATE _____ ZIP _____

2. REFRIGERATION SYSTEM TYPE AND MANUFACTURER (check one box for the medium-temperature system and list the manufacture of that system, and check one box for the low-temperature system and list the manufacturer of that system)

SYSTEM TYPE	MEDIUM-TEMPERATURE SYSTEM		LOW-TEMPERATURE SYSTEM	
	TYPE	MANUFACTURER	TYPE	MANUFACTURER
Centralized Direct-Expansion Parallel Rack	<input type="checkbox"/>	_____	<input type="checkbox"/>	_____
Distributed Direct-Expansion	<input type="checkbox"/>	_____	<input type="checkbox"/>	_____
Glycol-Secondary-Loop	<input type="checkbox"/>	_____	<input type="checkbox"/>	_____
CO ₂ Secondary-Loop	<input type="checkbox"/>	_____	<input type="checkbox"/>	_____
CO ₂ Cascade	<input type="checkbox"/>	_____	<input type="checkbox"/>	_____
CO ₂ Transcritical	<input type="checkbox"/>	_____	<input type="checkbox"/>	_____
Other (please specify): _____	<input type="checkbox"/>	_____	<input type="checkbox"/>	_____

3. REFRIGERANT TYPE AND CHARGE SIZE (complete the table below)

EQUIPMENT TYPE	REMOTE-COMMERCIAL REFRIGERATION SYSTEM		SELF-CONTAINED EQUIPMENT	HVAC EQUIPMENT
	MEDIUM-TEMPERATURE	LOW-TEMPERATURE		
Primary Refrigerant Type	_____	_____	_____	_____
Primary Refrigerant Charge (lbs)	_____	_____	_____	_____
Secondary Refrigerant Type	_____	_____	_____	_____
Secondary Refrigerant Charge (lbs)	_____	_____	_____	_____

*Including soda machines, vendor-supplied coolers, ice machines, refrigerators in deli areas, etc.

All information provided will be treated as confidential business information (CBI), as stipulated under Clean Air Act provisions, and will not be divulged either to other partners or publicly.

Fully operational requires that a store can provide actual emissions data for ideally 12 months.

**Including "personal" AC in staff offices

4. TOTAL REMOTE-COMMERCIAL REFRIGERATION LOAD (MBTUS/HOUR) _____

DO NOT include the store's HVAC system (split systems or self-contained), self-contained refrigeration equipment, sub-cooling, heat-of-rejection, or pump heat.

5. AMOUNT OF HFC REFRIGERANT (LBS) EMITTED OVER THE LAST 12 MONTHS _____

DO NOT include emissions from HVAC equipment or self-contained refrigeration equipment. If an HFC refrigerant is not used, this question may be left blank.

- 6. REQUIRED ATTACHMENTS CHECKLIST** (if an HFC refrigerant is not used, Attachment C is not required)
- A. STORE'S REFRIGERATION SYSTEM LEGEND (SCHEDULE) - A copy of the store's current refrigeration system legend (schedule) that lists the BTU output of all remote commercial refrigeration equipment.
 - B. SUPPORTING DOCUMENTATION FOR REFRIGERANT CHARGE - A letter, signed by an authorized installation company representative, detailing the amount of refrigerant (lbs.) the commercial refrigeration system holds when properly charged. Due to possible leaks, invoices are not sufficient for verifying a system's charge.
 - C. SUPPORTING DOCUMENTATION FOR HFC ANNUAL EMISSIONS OR EMISSIONS RATE - Documentation may include an emissions report from a store's leak tracking software.

7. SIGNATURE/CERTIFICATION BY AUTHORIZED COMPANY REPRESENTATIVE

Please have an authorized representative of the store seeking certification sign this application to attest that all information contained is true and correct.

Name: _____ Title: _____

Telephone: _____ Email: _____

Signature: _____ Date: _____

8. CONTACT INFORMATION

Please provide contact information for a technical contact regarding the store certification application.

Name: _____ Title: _____

Street Address: _____

City: _____ State: _____ Zip: _____

Telephone: _____ Email: _____

For assistance on completing the form, please refer to the [GreenChill Store Certification Program Guidance](#). Please direct any questions and send completed forms and attachments to Tom Land (Land.Tom@epa.gov, 202-343-9185).

GreenChill reserves the right to deny store certification based on a company's Clean Air Act Title 6 enforcement issues.

If you do not receive an email confirming receipt of your application within 2 business days, please notify EPA.

7. SIGNATURE/CERTIFICATION BY AUTHORIZED COMPANY REPRESENTATIVE

Please have an authorized representative of the store seeking certification sign this application to attest that all information contained is true and correct.

Name: _____ Title: _____
Telephone: _____ Email: _____
Signature: _____ Date: _____

8. CONTACT INFORMATION

Please provide contact information for a technical contact regarding the store certification application.

Name: _____ Title: _____
Street Address: _____
City: _____ State: _____ Zip: _____
Telephone: _____ Email: _____

For assistance on completing the form, please refer to the [GreenChill Store Certification Program Guidance](#). Please direct any questions and send completed forms and attachments to Tom Land (Land.Tom@epa.gov, 202-343-9185).³

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Note: When referring to any EPA Award, please include the year in which the award was received.

End of document ■

³ If you do not receive an email confirming receipt of your application within 2 business days, please notify EPA.



~Confidential Business Information~¹ Recertification of Food Retail Stores

GreenChill's Store Certification is valid for one year. At the end of your store's certification period, you may apply to have your store re-certified for an additional year. If your store is applying to re-qualify for GreenChill platinum-, gold-, or silver-level store certification, please answer the following questions about the store seeking re-certification.

1. STORE NAME (as you would like it to appear on the award certificate): _____
 STORE #: _____ STREET ADDRESS: _____
 CITY: _____ STATE: _____ ZIP: _____

2. REFRIGERATION SYSTEM TYPE AND MANUFACTURER (check one box for the medium temperature system and list the manufacture of that system, and check one box for the low temperature system and list the manufacturer of that system)

SYSTEM TYPE	MEDIUM TEMPERATURE SYSTEM		LOW TEMPERATURE SYSTEM	
	TYPE	MANUFACTURER	TYPE	MANUFACTURER
Centralized Direct Expansion Parallel Rack	<input type="checkbox"/>		<input type="checkbox"/>	
Distributed Direct Expansion	<input type="checkbox"/>		<input type="checkbox"/>	
Glycol Secondary Loop	<input type="checkbox"/>		<input type="checkbox"/>	
CO ₂ Secondary Loop	<input type="checkbox"/>		<input type="checkbox"/>	
CO ₂ Cascade	<input type="checkbox"/>		<input type="checkbox"/>	
CO ₂ Transcritical	<input type="checkbox"/>		<input type="checkbox"/>	
Other (please specify): _____	<input type="checkbox"/>		<input type="checkbox"/>	

¹ All information provided will be treated as confidential business information (CBI), as stipulated under Clean Air Act provisions, and will not be divulged either to other partners or publicly.

3. REFRIGERANT TYPE AND CHARGE SIZE (complete the table below)

EQUIPMENT TYPE	REMOTE COMMERCIAL REFRIGERATION SYSTEM		SELF-CONTAINED EQUIPMENT*	HVAC EQUIPMENT**
	MEDIUM TEMPERATURE	LOW TEMPERATURE		
Primary Refrigerant Type				
Primary Refrigerant Charge (lbs)				
Secondary Refrigerant Type				
Secondary Refrigerant Charge (lbs)				

*Including soda machines, vendor supplied coolers, ice machines, refrigerators in deli areas, etc.
 **Including "personal" AC in staff offices

4. CHANGE IN TOTAL REMOTE COMMERCIAL REFRIGERATION LOAD (MBTUS/HOUR) SINCE THE STORE'S LAST GREENCHILL CERTIFICATION? NO YES

If **YES**, record the store's total remote commercial refrigeration load (MBTUs/hour) below and attach a copy of the store's current refrigeration system legend (schedule) that lists the BTU output of all remote commercial refrigeration equipment.

TOTAL REMOTE COMMERCIAL REFRIGERATION LOAD (MBTUS/HOUR): _____

DO NOT include the store's HVAC system (split systems or self contained), self-contained refrigeration equipment, sub-cooling, heat of rejection, or pump heat.

5. AMOUNT OF HFC REFRIGERANT (LBS) EMITTED OVER THE LAST 12 MONTHS: _____

DO NOT include emissions from HVAC equipment or self-contained refrigeration equipment. If an HFC refrigerant is not used, this question may be left blank.

SUPPORTING DOCUMENTATION FOR HFC ANNUAL EMISSIONS: Documentation may include an emissions report generated from your store's leak tracking software, a refrigeration system status report, or a signed letter from your store's servicing/maintenance contractor confirming the quantity of refrigerant added to the system over the past year. If there have been zero leaks, a signed letter by the person/contractor responsible for tracking leaks is also acceptable. (If an HFC refrigerant is not used, supporting documentation for annual emissions is not required).

6. SIGNATURE/CERTIFICATION BY AUTHORIZED COMPANY REPRESENTATIVE

Please have an authorized representative of the store seeking certification sign this application to attest that all information contained is true and correct.

Name: _____ Title: _____
Telephone: _____ Email: _____
Signature: _____ Date: _____

7. CONTACT INFORMATION

Please provide contact information for a technical contact regarding the store certification application.

Name: _____ Title: _____
Street Address: _____
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