



GreenChill

Annual Recognition Event

September 9, 2021

Presentation Overview



- GreenChill Program Overview
- Trends and Achievements in 2020 - GreenChill Partners and GreenChill Certified Stores
- Remarks from Office of Atmospheric Programs Director, Chris Grundler
- GreenChill Recognition - Presentation of Awards
- Presentations by Recognition Recipients

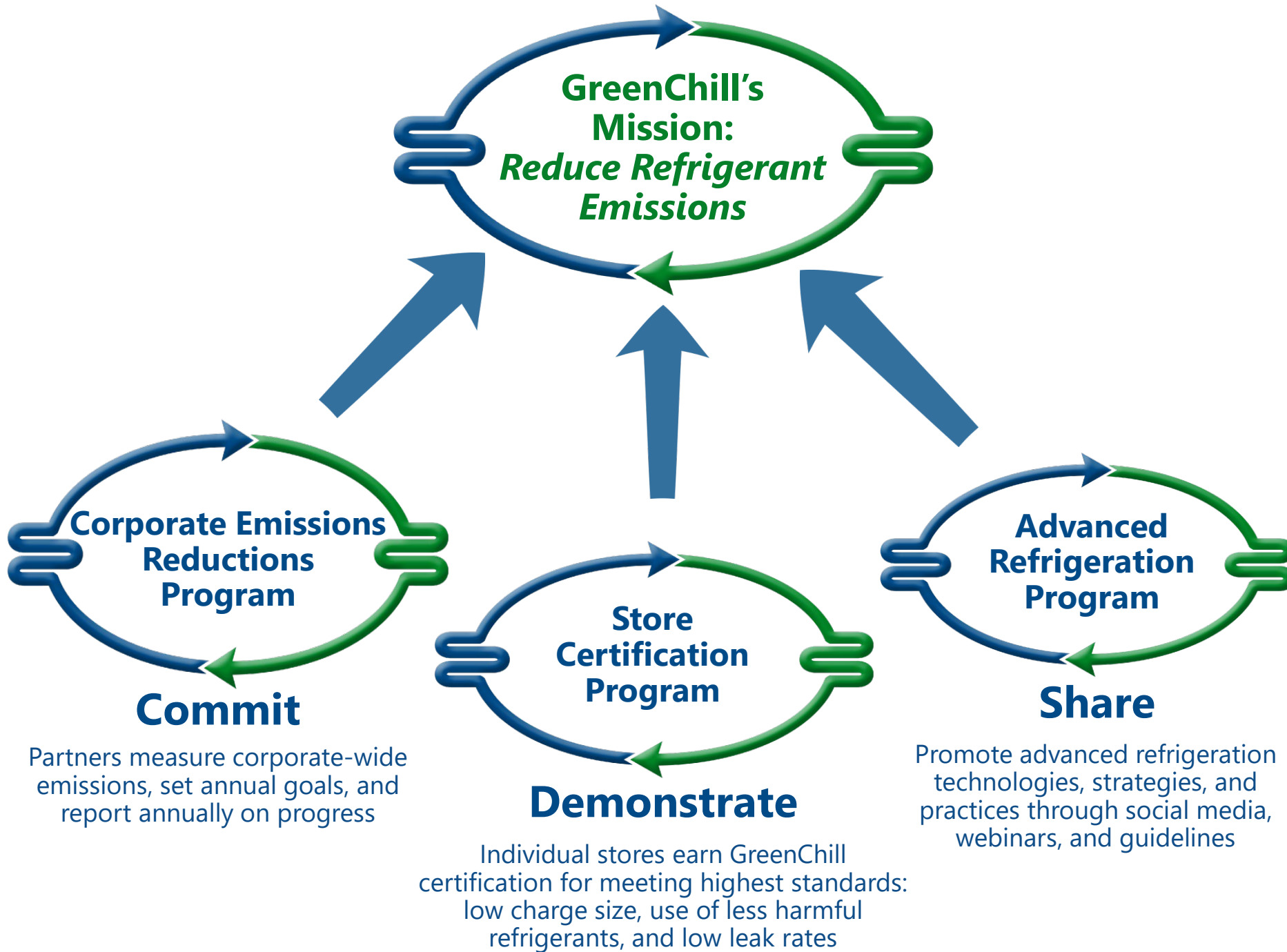
Program Overview



GreenChill is a voluntary partnership program that works collaboratively with the food retail industry to reduce refrigerant emissions and decrease stores' impact on the ozone layer and climate system

GreenChill works to help food retailers:

- Lower refrigerant charge sizes and eliminate leaks
- Transition to environmentally friendlier refrigerants
- Adopt green refrigeration technologies and best environmental practices



Corporate Emissions Reduction Program



- Food Retailers (Supermarkets, grocery stores, supercenters, co-ops, wholesale clubs)
 - Reduce corporate refrigerant emissions by annually setting reduction goals and measuring corporate stocks and emissions
 - Report data to EPA
- Refrigeration Systems Manufacturers
 - Promote the adoption of advanced refrigeration technologies, and share strategies and best practices
 - Report equipment sales data to EPA
- Chemical Producers
 - Promote the adoption of environmentally friendlier retrofit chemicals and secondary fluids

Active GreenChill Partners	
Food Retailers Banners	28 50
Refrigeration Systems Manufacturers	5
Chemical Producers	6

GreenChill Partners Lead the Way



Store Certification Program



- Certified stores demonstrate leadership in food retail refrigerant management
- These stores:
 - Use only non-ozone depleting refrigerants
 - Have lower refrigerant charge sizes and leak rates compared to the average food retail store*
- Any food retail store in the United States can apply; not necessary to be a GreenChill Partner



Platinum, Gold, and Silver certification levels

*Determines certification level.

Newest GreenChill Partners



Welcome to our newest Partners!

*Ashland Food Co-op and The Giant Company
joined GreenChill this year*





Trends and Achievements in 2020



Food Retail Partners



2007

**GreenChill Partners
account for 1/3 of
the supermarket
industry***

7
Partners

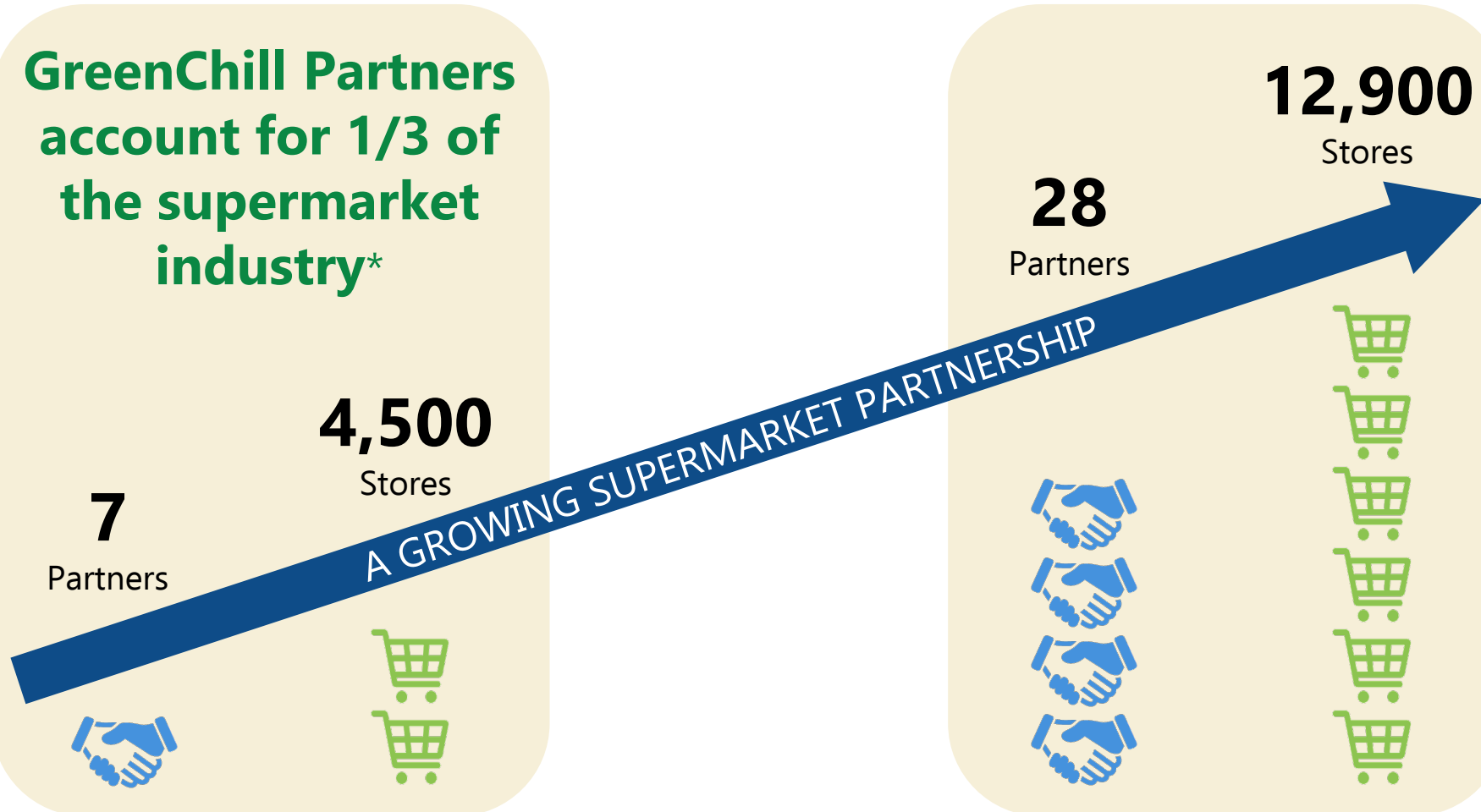
4,500
Stores



2020

12,900
Stores

28
Partners



*Food Marketing Institute Supermarket Facts (2018).

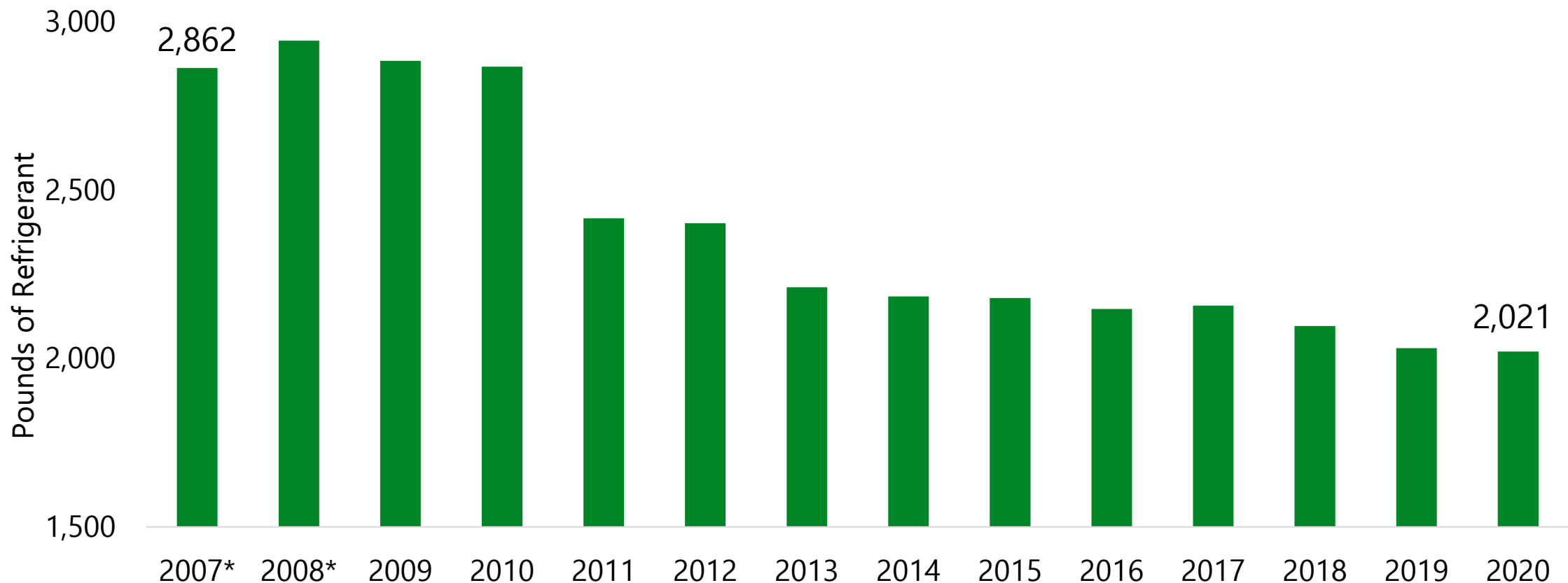
Partner Highlights - 2020



- Partner average emissions rate: 13.2%*
 - Improvement from 2019 (14.3%)
- 15 Partners (~60%) were at or below the Partnership average
- 6 Partners were in the "10% and Under Club"
- 70% of Partners reduced or maintained their emissions rate versus 2019
- 65% of Partners reduced or maintained their emissions rate versus their baseline year
 - 1 has reduced their emissions rate by at least 50%
 - 3 have reduced their emissions rate by at least 30%
 - 4 have reduced their emissions rate by at least 20%
 - 2 have reduced their emissions rate by at least 10%
 - 2 have reduced their emissions rate by at least 5%

* Includes emissions from commercial systems with a charge ≥ 50 pounds (lbs.) of refrigerant.

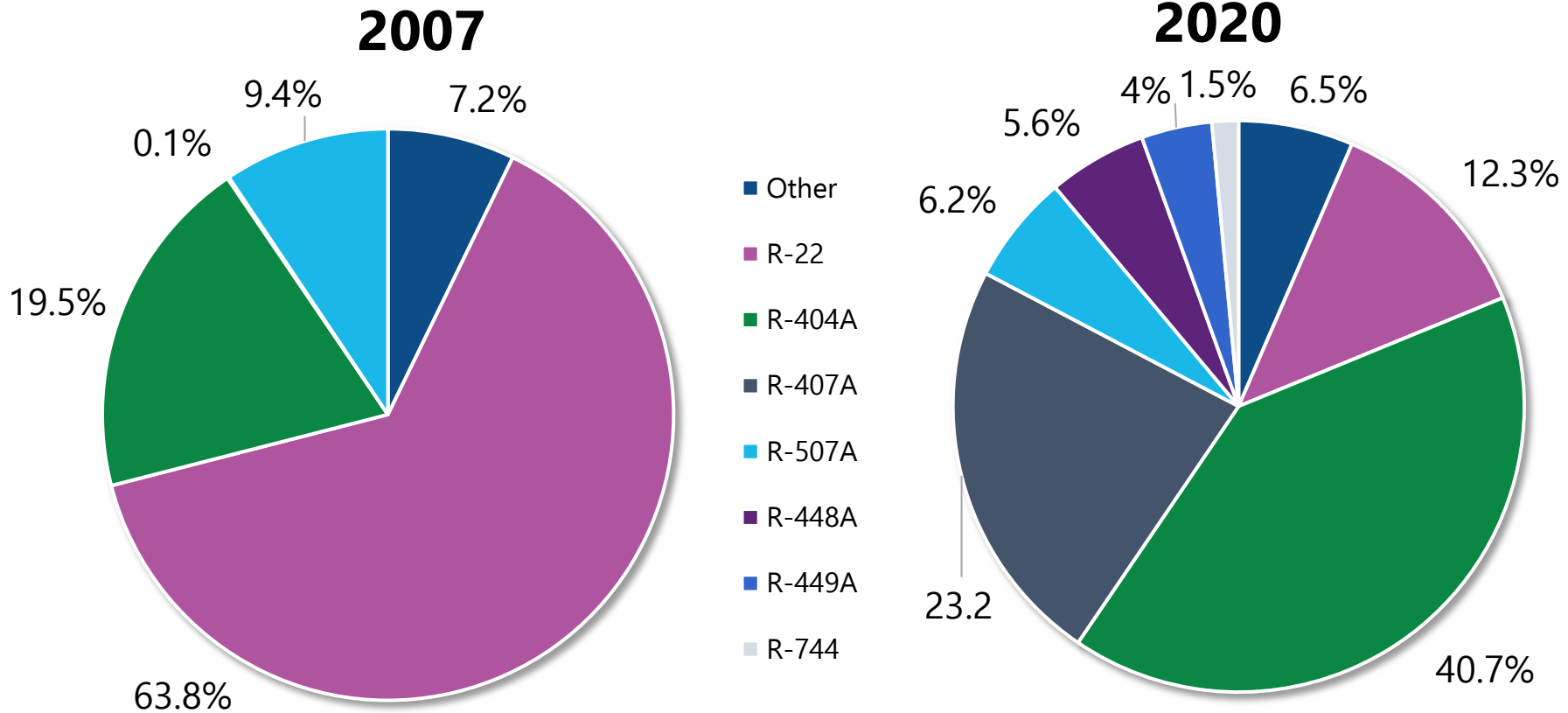
Average Installed Refrigerants



KEY TAKEAWAY

On average, Partners are using about 29% less refrigerant in stores than in 2007

Partnership Installed Refrigerants



KEY TAKEAWAY

Partners are transitioning from ozone-depleting substances (ODS) and high-global warming potential (GWP) hydrofluorocarbons (HFCs) toward lower-GWP alternatives

Partners' Impact



If every supermarket reduced its emissions rate to the GreenChill Partnership average, the supermarket industry could:



Save more than
\$251 million
in refrigerant
replacement costs



Reduce emissions by about **31 million metric tons of carbon dioxide equivalent (MMTCO₂e)** and **84 ozone depleting potential (ODP) metric tons (MT)***
(68,300 lbs. CO₂e and 185,200 ODP lbs.)

In 2020, Partners achieved the following results. These are based on a comparison of Partners' actual performance versus the industry average.



Avoided more than
\$80 million in
refrigerant
replacement costs



Avoided emissions of about **10 MMTCO₂e** and **27 ODP MT***
(22,050 lbs. CO₂e and 60,000 ODP lbs.)

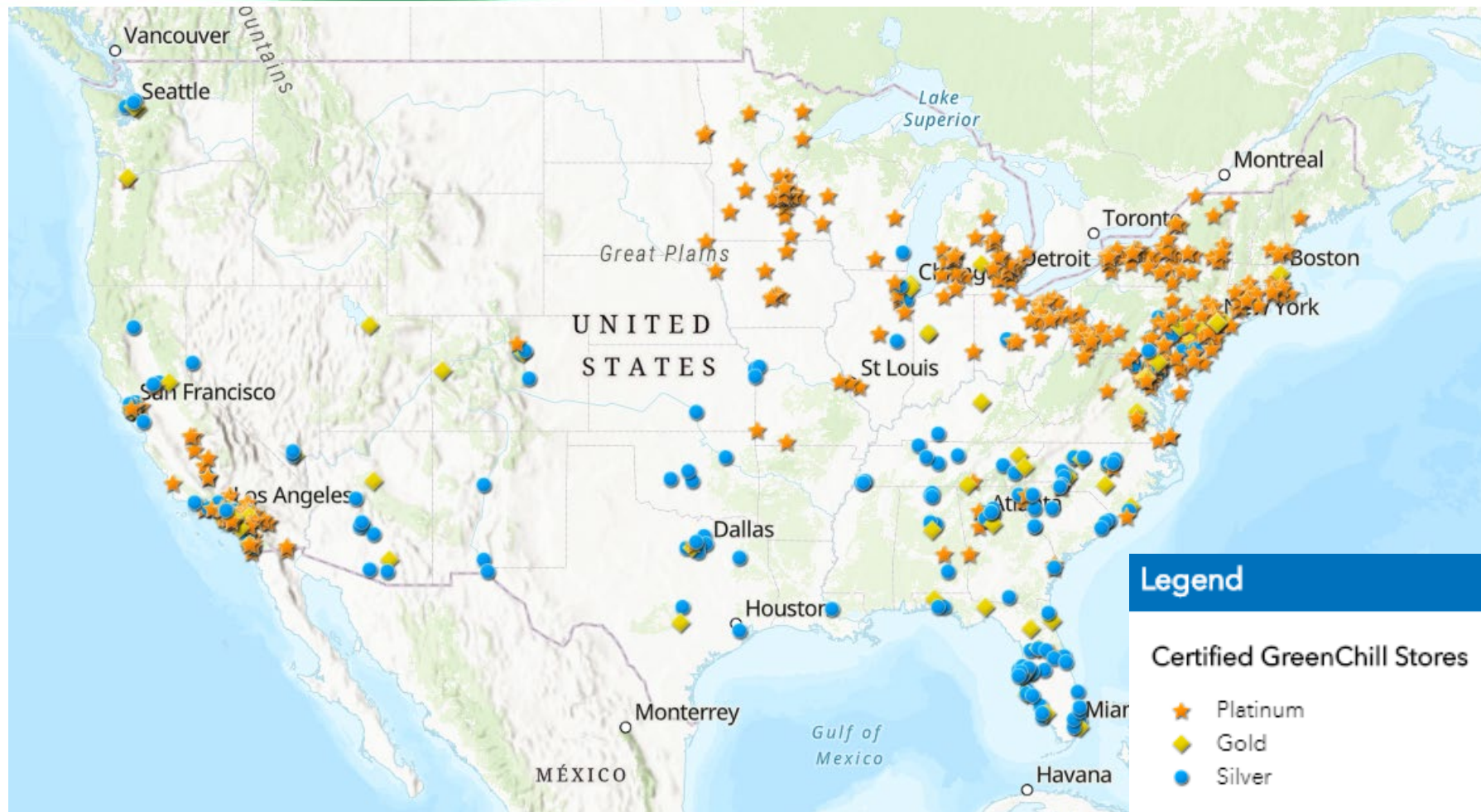
*Assumes industry average emissions rate is 25%.

Store Certification Program



*As of April 30, 2021.

GreenChill Certified Stores - 2020



View the interactive map and table of certified stores
www.epa.gov/greenchill/greenchill-store-certifications

Benefits from Certified Stores -2020



~244,591
MTCO₂e
(539.2M lbs.)
emissions avoided



Emissions avoided are equivalent to CO₂ emissions from approximately:

44,428 homes' electricity use for one year



Greenhouse gas (GHG) emissions from 53,194 from passenger vehicles driven for one year

www.epa.gov/climate-change



Chris Grundler, Director,
Office of Atmospheric Programs





GreenChill Recognition





- GreenChill is recognizing 12 companies in seven categories with a total of 74 achievements across the two Programs
- Partnership Program achievements occurred in the 2020 calendar year
- Store Certification Program achievements occurred from July 1, 2020, to June 30, 2021

Superior Goal Achievement

*Partner that achieves its annual refrigerant emissions reduction goal.
Goal must be below the leak rate achieved the year before.*



This year, eight Partners achieved their 2020 refrigerant emissions rate goals.

Exceptional Goal Achievement

*Partner that achieves its "stretch" refrigerant emissions reduction goal.
This goal is more difficult to achieve than Superior Goal Achievement.*



This year, two Partners achieved their 2020 "stretch" goal.

Most Improved Emissions Rate

*Partner with the most improved emissions rate for commercial systems
from the previous year.*



Most Improved Emissions Rate

*Partner with the most improved emissions rate for commercial systems
since the year they joined the Partnership.*

The logo for 'weis' is displayed in a bold, lowercase, sans-serif font. The letters are white and are set against a solid red rectangular background. The 'w' is the largest character, followed by 'e', 'i', and 's' in descending order of size.

weis

Best Emissions Rate

Retail Chain

Lowest refrigerant emissions rate of all Partners.



Best Emissions Rate

Small-Independent

Lowest refrigerant emissions rate of all Partners.





Jennifer Stoltz from Cook County Whole Foods Co-op. Jennifer facilitated the construction of the Co-op's refrigeration systems.



Store Leadership



Canoga Park, CA

This Grocery Outlet, Inc. store is the first GreenChill certified store to exclusively use propane in its commercial refrigeration systems

Store Certification Excellence

Supermarket

The supermarket company that achieves the most GreenChill store certifications in the past year.





Aaron Sumida and
Amber Hardy from ALDI
with a carbon dioxide
system.

Store Certification Excellence

Systems Manufacturer

The commercial systems manufacturer with the most systems installed in GreenChill certified stores in the past year.

Hillphoenix[®]

A **DOVER**[™] COMPANY

Store Re-Certification Excellence

Each supermarket that renewed its GreenChill Store Certification for five consecutive years.

This year, 57 stores reached this achievement

Congratulations to the following
GreenChill Certified Stores ...



31 Stores!

- Batavia, NY
- West Seneca, NY
- Yucaipa, CA
- Moreno Valley, CA
- Beaumont, CA
- San Bernardino, CA
- Fontana, CA
- Palm Springs, CA
- La Quinta, CA
- Covina, CA
- Anaheim, CA
- Fountain Valley, CA
- Buena Park, CA
- Cerritos, CA
- La Verne, CA
- Highland - San Bernardino, CA
- Inglewood, CA
- Palmdale, CA
- Arcadia, CA
- South Gate, CA
- Pulaski, NY
- La Puente, CA
- Vista, CA
- Calexico, CA
- El Centro, CA
- Menifee, CA
- Palm Desert, CA
- Fairport, NY
- Bakersfield, CA
- Blasdell, NY
- Lake Elsinore, CA



21 Stores!

- Queen Creek, AZ
- Oklahoma City, OK
- Murfreesboro, TN
- Yukon, OK
- Wichita, KS
- La Verne, CA
- Overland Park, KS
- Ventura, CA
- Frisco, TX
- Sarasota, FL
- Albany , CA
- Decatur, GA
- Hemet, CA
- Tulsa, OK
- Keller, TX
- Glendale, AZ
- Las Vegas, NV
- La Habra, CA
- Cedar Park, TX
- Bakersfield, CA
- Tampa, FL



3 Stores!

- Detroit, MI
- Wauwatosa, WI
- Mokena, IL



TARGET

1 Store!

- Sausalito, CA



1 Store!

- Fogelsville, PA



Presentations by Recognition Recipients



Frank Davis

Director of Refrigeration Engineering, Energy & Sustainability at Grocery Outlet.

Frank is currently the Director of Refrigeration Engineering, Energy & Sustainability for Grocery Outlet. Responsible for the design, bidding, installation and maintenance of all facilities refrigeration, heating, ventilation, and air conditioning (HVAC) equipment. Participate in site evaluation for new stores and relocations. Responsible for review of all store plans and purchase of all store equipment. Additionally, implement all energy initiative programs and provide guidance on sustainability programs to promote sustainable investing. Currently on the Board of Directors for the North American Sustainable Refrigeration Council. He has over 20 years' experience with supermarket refrigeration and HVAC mechanical systems.





Grocery Outlet Refrigeration and Sustainability Update

9-9-2021

Agenda

- Grocery Outlet Company Overview
- Grocery Outlet Current Design Types
 - HFC Distributed (DX) Rack with Loop Piping
 - Transcritical Carbon Dioxide (CA Region)
 - Micro-distributed (Propane)
- Predictive Analytics Solutions



Grocery Outlet Company Overview

Grocery Outlet is a high-growth, extreme value retailer of quality, name-brand consumables and fresh products sold through a network of independently operated stores. The company has **400 stores** in the Western US and the Mid-Atlantic Northeast Region. Based on the company's experience, in addition to research conducted by e-Site Analytics, Grocery Outlet believes there is an opportunity to establish over **1,500** additional locations in the states in which we currently operate and in neighboring states. Our goal is to expand our store base by approximately 10% annually by penetrating existing and contiguous regions. Over the long term, we believe the market potential exists to establish **4,800** locations nationally.



HFC DX Rack with Loop Piping (New Specs)

Equipment Item	Description
Compressor System	<ul style="list-style-type: none"> • Refrigeration compressor rack including multiple compressors providing medium and low temperature refrigeration to the cases and walk-ins • Typically installed on equipment platform or in equipment room inside store (R-448a)
Condenser	<ul style="list-style-type: none"> • Roof mounted, air-cooled OR • Hybrid/adiabatic unit with evaporating cooling capability – high efficiency
Piping	<ul style="list-style-type: none"> • Central store loop systems with branch piping to individual systems/fixtures • Significantly less copper, lower refrigerant charge, more efficient
Other Notes	<ul style="list-style-type: none"> • Loop piping system utilizes electric defrost as opposed to hot gas defrost used in direct circuited stores. New design uses HVAC roof-top units and dedicated outdoor air systems for high humidity regions.



CO₂ Rack Systems

Equipment Item	Description
Compressor System	<ul style="list-style-type: none"> • Refrigeration compressor rack including multiple compressors providing medium and low temperature refrigeration to the cases and walk-ins • Typically installed on equipment platform or in equipment room inside store
Gas Cooler	<ul style="list-style-type: none"> • Roof mounted, hybrid/adiabatic gas cooler with evap cooling function
Piping	<ul style="list-style-type: none"> • Central store loop systems with branch piping to individual systems/fixtures • Less piping, lower charge, more efficient
Other Notes	<ul style="list-style-type: none"> • CO₂ (R-744) is the only natural refrigerant with a GWP of 1 • Higher operating pressures, harder to maintain and service • Lower population of service techs capable of servicing • Many advancements and features not included in East Sac store to be considered for future installations



Micro-Distributed Systems

Equipment Item	Description
Compressor System	<ul style="list-style-type: none"> • Individual compressor systems installed on each set of cases and in packaged units for walk-ins • Refrigerant kept to self-contained systems in each fixture • Small, fractional horsepower, efficient compressors • Can be water- or air-cooled
Fluid Cooler	<ul style="list-style-type: none"> • Roof mounted fluid cooler and pumps for cooling water circulation
Piping	<ul style="list-style-type: none"> • Water piping circulated in a loop fashion throughout store to pickup heat rejection from each system and dispel through rooftop fluid cooler • No refrigerant piping outside of self-contained systems
Other Notes	<ul style="list-style-type: none"> • Propane (R-290) is a natural, hydrocarbon refrigerant with GWP <150 meeting low GWP regulations • Charge limited to 150 grams per system, currently



Predictive Analytics Solution

- **Predictively identify** refrigeration problems before you receive alarms. This solution will allow us to see multi-site refrigeration & energy data in a single dashboard
- Predictively identify and diagnose problems before they cause emergencies
- Monthly report summarizes refrigeration anomalies, prioritized by return on investment, across the enterprise
- Addresses problems before unplanned refrigeration outages occur
- Lower refrigerant leak rates to improve efficiency and avoid climate impact



Jason Flanigan

Sr. Mechanical Engineer

Jason is responsible for improving store performance and reducing energy consumption across the Meijer fleet of stores. He has been with Meijer for over five years. Jason has a Bachelors in Mechanical Engineering and a Masters in Computer Science.




Peter Seidl

Mechanical Systems Specialist

Pete is responsible for all refrigerant management at Meijer. He is also responsible for supporting Facilities Maintenance with all HVAC and Refrigeration needs at Meijer. He has been with Meijer for over 29 years.





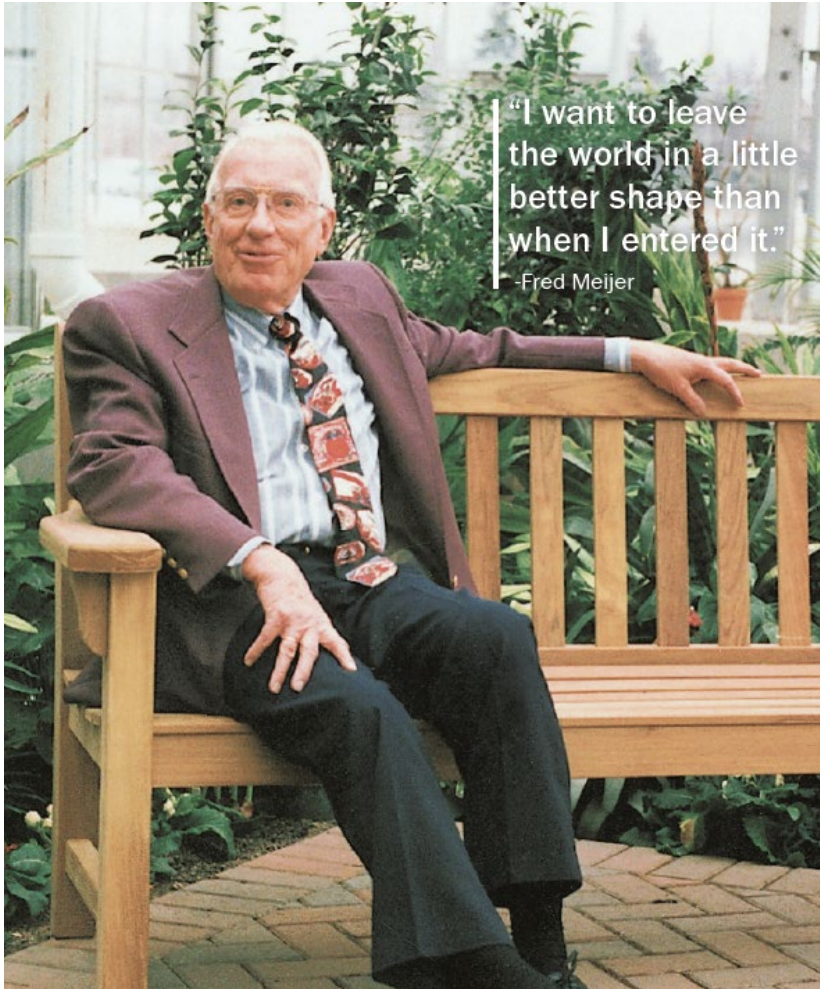
meijer
STORE PLANNING + DESIGN
ENERGY + ENGINEERING
CREATING • DESIGNING • PLANNING • SUPPORTING

Refrigerant Management at Meijer

09/09/2021

Why Refrigerant Management Is important at Meijer

Meijer's Sustainability Commitment



Environmental compliance



Local & sustainable products



Carbon footprint intensity reduction

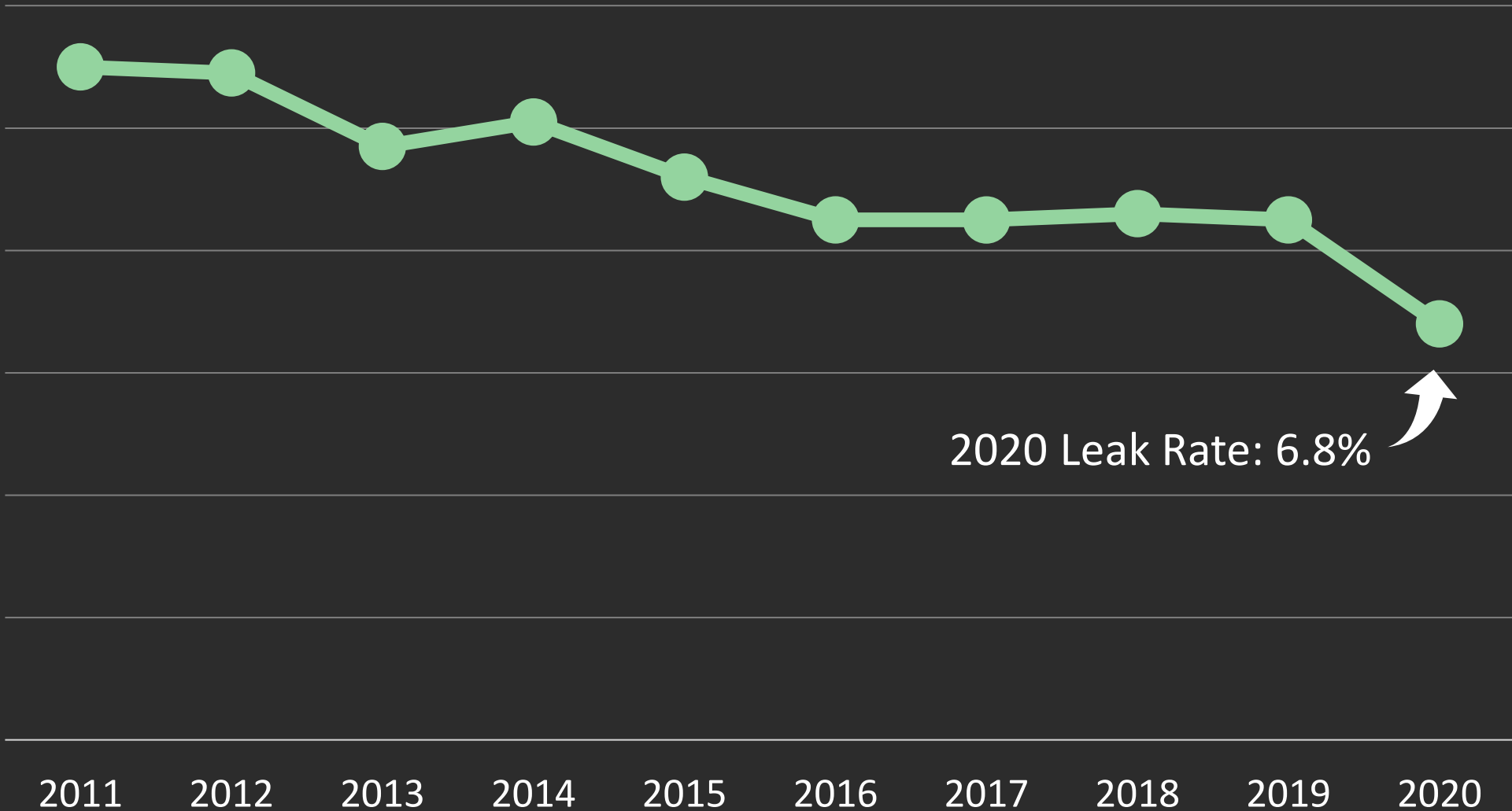


Waste reduction



Responsible growth

Meijer Refrigeration Leak Rate



Refrigerant Management at Meijer



Proactive
Maintenance
Practices



Remote Leak
Detection
Systems



Refrigerant
Transition



Alternate
Technology

Leak Checks

Proactive Maintenance Practices

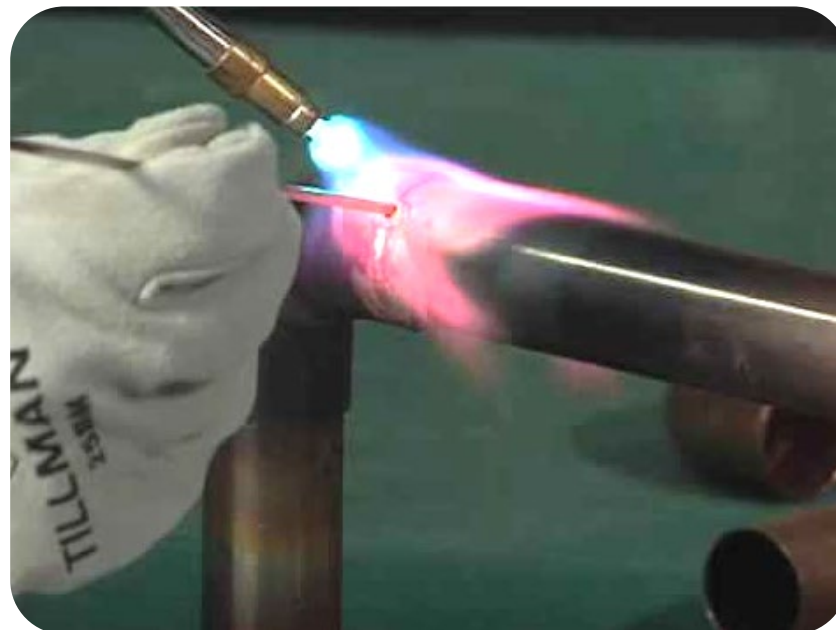
- All commercial racks are leak checked quarterly in every store
- A preventative maintenance notice is generated automatically by the Refrigerant Management System
- Any identified leak is immediately repaired
- All repairs are verified by two methods and documented in refrigerant management system



Leak Events

Proactive Maintenance Practices

- It is Meijer policy to fix ALL refrigerant leaks, regardless of leak rate
- If leak threshold (20%) is exceeded, an additional technician is required to leak check all systems in the store
- All repairs are verified by two methods and documented in refrigerant management system



Remote Leak Detection Systems (RLDS) meijer

STORE PLANNING + DESIGN
ENERGY + ENGINEERING

Proactive Maintenance Practices

- Started adding RLDS system to monitor sales floor and backroom leaks in 2015
- Finalizing full fleetwide rollout this fiscal year
- System capable of reading as low as 1 part per million (ppm)
- The system sends a notice to the technician at 2ppm
- The system alarms at 3ppm
- Alarms are priority 1 and dispatched immediately
- 25% Reduction at stores with the RLDS



Centralized Refrigerant Recovery

Recovery, Cleaning, and Redistributing

- Empty cylinders shipped ahead of projects
- Refrigerant is recovered and shipped back to central processing
- Refrigerant is cleaned and prepared for use



Refrigerant Transition

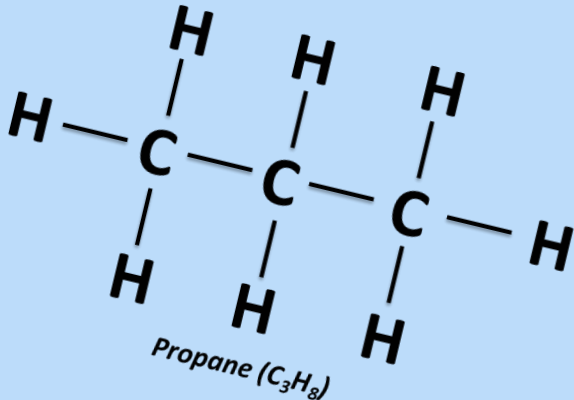
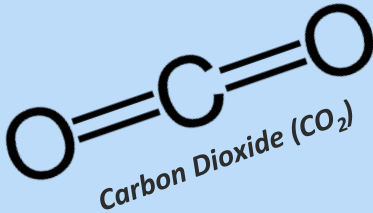
Reducing Environmental Impact



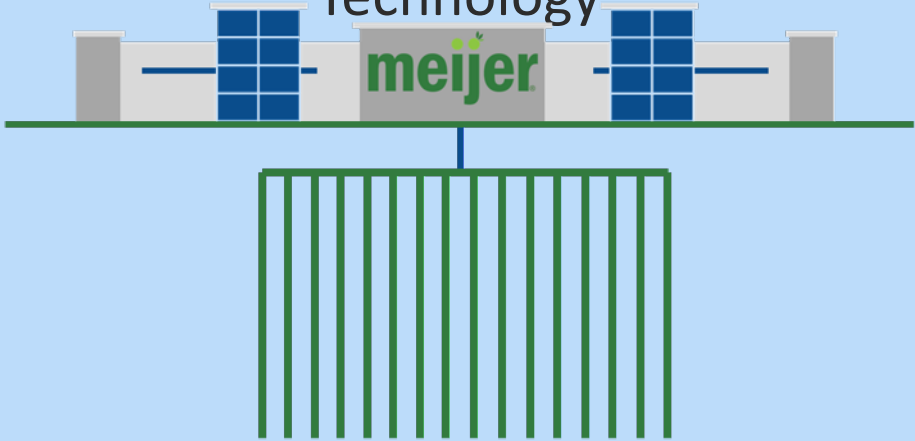
Alternate Technology

Reducing Environmental Impact

Natural Refrigerants



Geothermal Technology



m.

meijer.

Sprouts Farmers Market



Justin Kacer

Sustainability Manager

Justin leads sustainable food systems strategies and innovations at Sprouts Farmers Market, where he is focused on leading positive change within Sprouts' operations and supply chain from carbon emissions reduction, sustainable packaging, and food waste diversion. He has more than 9 years of experience aligning sustainability purpose into culture.



ABOUT SPROUTS



- 365 stores across 23 states
- 7 Fresh Produce Distribution Centers
- In 2021, Sprouts will open approximately 13-20 stores and will introduce updated signage and décor in several stores

Farmers Market Feel

- Welcoming, open atmosphere
- Fresh, seasonal produce at the center of the store

Innovation Storewide

- Unique, exclusive products in frozen, grocery, vitamins and supplements, and more

Sustainable ways to shop

- Bulk Department, 100% Sustainable Seafood, Frozen and Refrigerated Plant-Based Meat Alternatives, Supply Chain Social Standards (e.g., Fair Trade and Certified Humane Committed)



Central to our identity is a genuine commitment to environmental sustainability.

From lowering our greenhouse gas emissions to recovering food that can go to those in need instead of the landfill, we care deeply about reducing our resource footprint while providing our customers with local, organic, and other sustainable food choices.





Climate

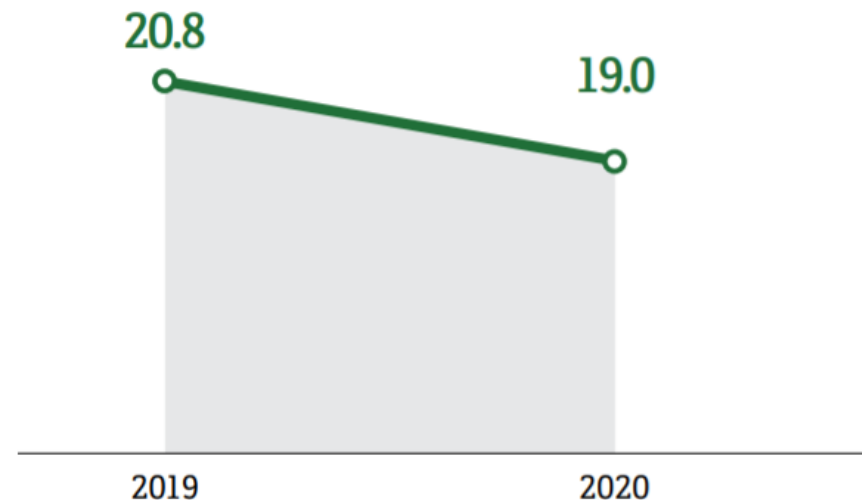
- **10% reduction of carbon emissions** per square foot from 2019
- **35% reduction of refrigeration-related emissions** per store over a 2016 baseline
- **15% reduction in waste** sent to landfill

CLIMATE - ENERGY AND EMISSIONS MANAGEMENT

Our electricity and natural gas usage over the last two years has remained well below our unit growth rate of 6.5%

Energy Source	2019	2020	% Change
Electricity (Megawatt hour (MWh))	464,455	483,724	4.1%
Natural Gas (dekatherm (Dth))	1,001,446	987,459	-1.4%

Our normalized carbon dioxide equivalent emissions per square foot (tCO₂e/sq ft) continues to decline





- Sprouts Farmers Market joined the GreenChill Partnership in 2007
- Sprouts has received 53 GreenChill Recognitions, including 40 for Store Re-certification Excellence
- 90 Sprouts stores are currently GreenChill Certified

REFRIGERATION INITIATIVES

To help further reduce our fugitive refrigeration emissions, Sprouts has remained focused on improved design, lower-GWP refrigerants, and improved leak detection and response times.

New stores designed to achieve **GreenChill Silver** status

CO₂ or R-448a refrigerant utilized in all new store builds

Utilization of a bespoke **leak detection monitoring system** with same day response times

Regular leak prevention checks for systems with no automated leak detection monitoring in place

UPCOMING INITIATIVES



All new California stores will be built with **natural CO₂ refrigeration systems**

Lower GWP refrigerants incorporated into new stores across country

Testing new **Artificial Intelligence software** to improve leak detection

New, **smaller format stores** will be 21,000 - 25,000 square feet (versus 28-30k footprint of recent stores)



THANK YOU!



Bright Future



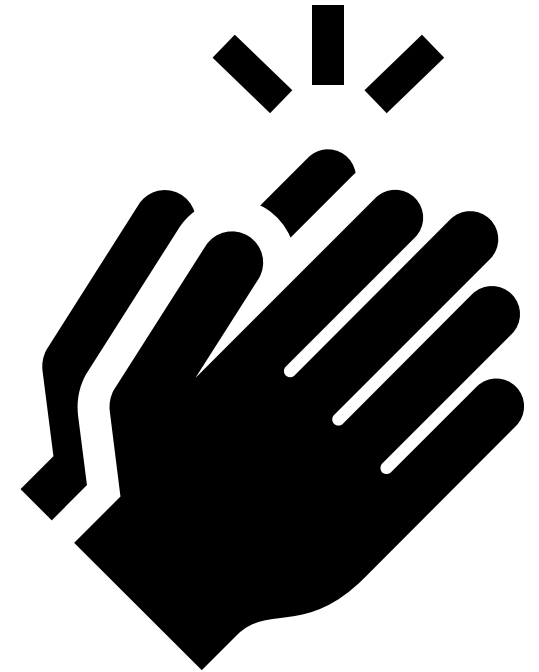
- Looking forward to welcoming **new Partners** to the Partnership and **new stores** to the Store Certification Program
- Exploring partnership expansion to include **small format stores**
- Exploring opportunities to work with **colleges/universities**
- Exploring opportunities to **improve communication** with **Tribal** and **historically disadvantaged communities**
- Updating the **GreenChill Store Certification Criteria**
- Advancing supermarket **technology transition**



Acknowledgments



- Congratulations to each recognition recipient!
- Thank you to our GreenChill Partners and GreenChill Certified Stores – we value and appreciate your participation in and contribution to GreenChill!
- Thank you to our supporters - all play a role through data reporting, store certifications, refrigerant management plans, webinar presentations, and input on GreenChill programs and resources.



Thank you!



www.linkedin.com/groups/1426947/

www.epa.gov/greenchill

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