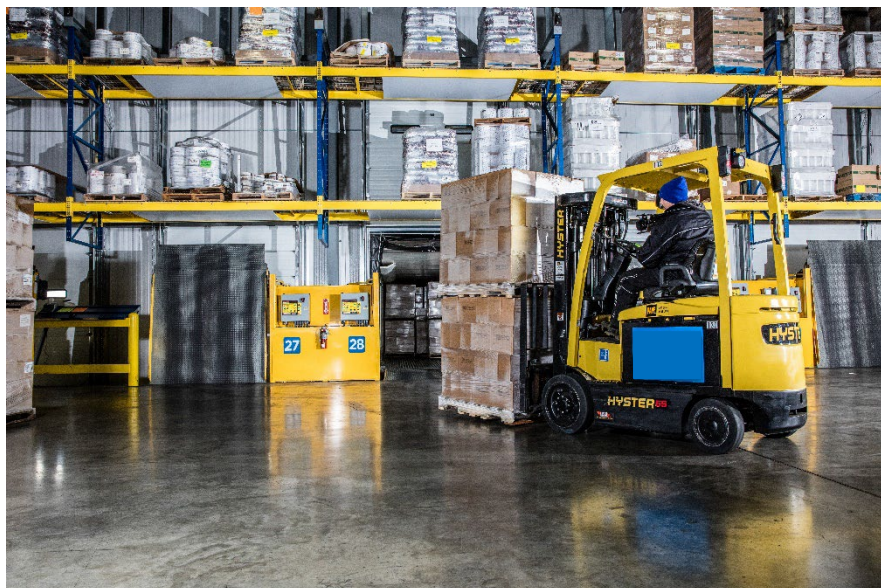




Local Approaches to Reducing Refrigerant Emissions: A How-To Guide for Communities

Updated July 30, 2026

Developed by:
City of Eugene Sustainability Program and BRING Recycling



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This report is a living document that may be continually updated as projects are completed and new efforts are identified.

Executive Summary

Refrigerants are chemical compounds used in commercial and household refrigeration and cooling systems. When leaked due to poor equipment maintenance or improper handling, they become highly potent greenhouse gases (GHGs) and significantly contribute to climate change. Refrigerants contribute to roughly 10% of global emissions, and in Eugene they contribute to roughly 8% of emissions. Despite their emissions impact, local municipalities and community organizations often lack clear strategies to address refrigerants.

This how-to guide demonstrates a variety of efforts at the local level led by the City of Eugene and a community partner, BRING Recycling to reduce the impact of refrigerants. Many of the approaches discussed can be scaled or adapted to be replicated in other regions.

In general, local governments and their partners may consider taking the following steps to address refrigerants:

- I. **Establishing a foundation:** This step includes gathering data to understand the local impact of refrigerants, establishing commitments through planning efforts, and building staff knowledge and technical partnerships in order to identify possible opportunities to integrate refrigerants into existing work.
- II. **Convening key stakeholders:** This step includes convening key local stakeholders, such as government agencies, community organizations, education institutions, businesses and the local utility, in order to begin local conversations on refrigerant management. Bringing people together early on helps identify needs and priorities, while building partnerships that can support future work.
- III. **Taking Action:** This step includes developing programs and projects that lead to reducing emissions from refrigerants. This may include targeting large and small businesses, commercial building owners, and households with education, assistance and resources that reduce refrigerant leakage. It may also include improving regional infrastructure to support refrigerant recovery and destruction or supporting global reduction in refrigerant emissions through the purchase of carbon offsets.

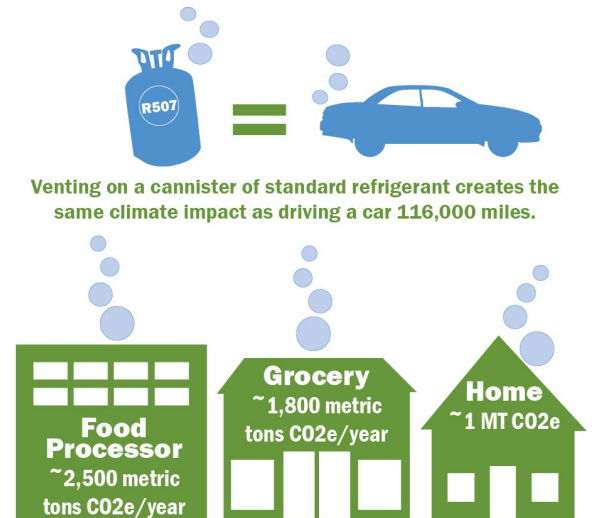
The report also captures potential future opportunities that local partners have identified. This list is included for other jurisdictions to consider as other possible approaches for reducing the impact of refrigerants.

Background

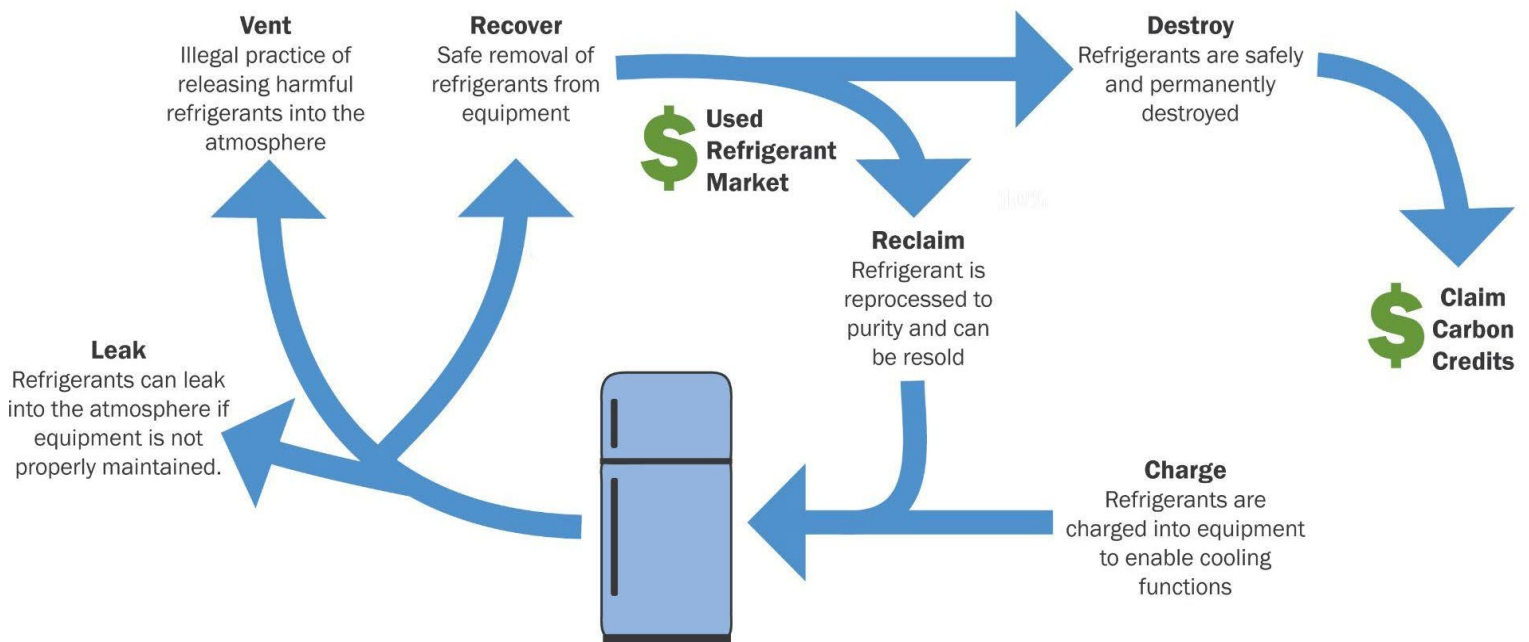
About Refrigerants

Refrigerants are chemical compounds found in commercial and household refrigeration and cooling systems, such as HVAC systems, walk-in coolers, freezers and appliances. When released into the atmosphere, either due to improper handling or leaks in aging equipment, they become highly potent greenhouse gasses (GHGs) that contribute to climate change. They have an outsized climate impact compared to other, commonly known sources of emissions. For example, venting a canister of standard refrigerant creates the same climate impact as driving a car 116,000 miles. Globally, they account for approximately 10% of global emissions¹. In Eugene, they contribute an estimated 8% of community-wide emissions².

Impact of Refrigerant Leaks



The graphic below shows the basic lifecycle of refrigerants and the practices that help keep them from being released into the atmosphere. Refrigerants are used in equipment and appliances to provide cooling. If this equipment isn't properly maintained, it can leak refrigerants into the air. Illegally venting equipment during servicing or when it's taken out of use can also release refrigerants.



¹ [Refrigerant Emissions Elimination Forum](#)

² [City of Eugene Greenhouse Gas Inventories](#)

Instead, refrigerants should be safely recovered. Once recovered, they can be processed and resold or permanently destroyed.

Reducing Emissions from Refrigerants

Reducing emissions from refrigerants will require an all-hands approach across global, federal, state and local levels of government, as well as extensive partnership and collaboration with business sectors, manufacturers, community organizations, higher education, residential households, and professionals across many other disciplines.

Global, Federal and State Action

There has been significant, global cooperation to address the impact posed by refrigerants. Global regulations, such as the Montreal Protocol and the Kigali Amendment, have phased out the production and use of certain classes of refrigerants with high global warming potential (GWP), including chlorofluorocarbons (CFCs). Federal regulations through the American Innovation in Manufacturing (AIM) Act³, passed in 2021, established a timeline for phasing out hydrofluorocarbons (HFCs) and will require businesses and households to maintain equipment to avoid leaks, safely handle and dispose of refrigerants, and begin to transition to alternative systems over the next few years. Some states are pushing ahead with additional regulations of their own. Oregon has not yet adopted measures to regulate refrigerants.

Commercial Building Owners and Businesses

Commercial building owners and businesses can take steps to prevent the release of refrigerants from large refrigeration and HVAC systems. Best practices include:

- (1) **Equipment maintenance:** Properly maintain equipment so that it is functioning at optimal performance to actively prevent refrigerant leaks.
- (2) **Refrigerant replacement:** If possible, replace high GWP refrigerants in equipment with lower GWP or “next generation” alternatives.
- (3) **Equipment upgrades:** If refrigerant replacement is not possible, develop a transition plan to upgrade equipment.

Residential Households

Refrigerants are also found in common household appliances such as heat pumps and fridges. Residents can also take steps to prevent the release of refrigerants from these appliances:

- (1) **Appliance maintenance:** Regularly replace filters and clean coils on fridges and appliances. Consult a technician if appliances are not functioning properly.

³ [Environmental Protection Agency, American Innovation and Manufacturing Act 2020](#)

- (2) **Proper appliance disposal:** Ensure appliances are properly disposed so that refrigerants can be safely removed.
- (3) **New appliances:** When upgrading to a new appliance, select ones that do not use CFC or HFC refrigerants.

Local Approaches to Address Refrigerants

This how-to guide will illustrate a variety of strategies that have been implemented by local community and governmental partners within the Eugene, OR region. Many of these strategies may be adapted to other jurisdictions to address refrigerant emissions.

Key Partners

Key partners, such as municipal and county governments, local utilities, higher education institutions, and local businesses that use refrigerants and service equipment, are critical to address local emissions from refrigerants.

This guide primarily spotlights recent work by the City of Eugene and BRING Recycling who have partnered more closely to move several refrigerant initiatives forward. It also spotlights other initiatives.

The **City of Eugene** governs Eugene, OR—a city located in Lane County and the second largest city in Oregon, with a population of roughly 175,000. The City has established GHG reduction goals through the Climate Recovery Ordinance and created a Climate Action Plan 2.0 as a roadmap for achieving those goals⁴. Local efforts focus primarily on reducing emissions associated with transportation, buildings, and waste, as well as efforts to improve resilience to climate change. The City continues to explore opportunities for addressing refrigerant emissions as resources and partnerships allow.



⁴ [Eugene's Climate Story](#)

BRING Recycling is a long-standing community partner. They operate many sustainability-related programs, including the Rethink Business program, which provides Lane County businesses with in-person outreach, technical assistance, and financial resources to help reduce pollution and emissions and achieve sustainability certification. BRING has recently integrated refrigerant-focused technical assistance into the Rethink Business program because of the incredible energy usage and cost savings that can be achieved for businesses, as well as the significant emissions reduction impact.



A variety of approaches have helped to address refrigerants and catalyze broader regional action on refrigerant management. The approaches are broken out into three sections: establishing a foundation, convening key stakeholders, and taking action.

I. Establishing a Foundation

The first step towards addressing refrigerants includes gathering data to understand their emissions contribution, establishing commitments through planning efforts, and building staff knowledge and technical partnerships to identify possible opportunities for integrating refrigerants into future work.

Refrigerants in Greenhouse Gas Inventories

GHG inventories are a tool that many communities use to understand and estimate emissions sources. GHG inventories that follow standard protocols typically include estimates of refrigerant emissions, which provides a useful starting point for understanding their level of impact locally. In Eugene, community-wide inventories have historically estimated these emissions at 8%, helping staff understand their contribution to total emissions relative to other categories. Cities can reference their previous inventories or conduct a new one to determine how much refrigerants contribute to total emissions.

Refrigerants in Climate Action Plans

Integrating refrigerant actions into climate action plans helps jurisdictions formalize a commitment to addressing this emissions source. Eugene's Climate Action Plan 2.0 (CAP2.0), approved in 2020, included Action F4, which states, "The City of Eugene will convene community partners with large amounts of refrigerants to identify options to reduce leaks from appliances and equipment⁵."

⁵ [Eugene's Climate Action Plan 2.0](#)

Including this action in the plan helped establish refrigerants as a local priority, even before the focus of the work had fully taken shape. Other jurisdictions may look for opportunities to incorporate refrigerant-related actions into their own plans to guide future implementation and signal long-term commitment. Even a broad commitment to exploration and learning can be a place to start.

Knowledge and Technical Partnerships

Building a basic understanding of refrigerant management is another important step, especially when staff may have limited experience with the topic. Additionally, identifying key partners who can offer technical expertise is crucial for expanding capacity. By establishing a foundation of knowledge and technical partnerships, organizations can clarify how to integrate refrigerants into existing work going forward.

At BRING, staff expanded their understanding of refrigerants through webinars, conferences, and networking. As staff learned about the significant climate impacts of refrigerants, they identified opportunities to integrate refrigerant-focused technical assistance into their programs for households and businesses; and identified higher education programs and local HVAC businesses who could provide valuable technical support and guidance as programs were developed and implemented. The following resources, events, and programs supported this learning:

- The [North American Sustainable Refrigeration Council](#) (NASRC) is a nonprofit working with the grocery refrigeration industry to work towards more sustainable refrigeration. Staff participated in their [free online webinar series](#) and connected with an NASRC technical lead who agreed to serve as a technical advisor for future projects. The NASRC also offers training for technicians.
- [Refrigerant Emissions Elimination Forum](#) offers educational resources on effective interventions for refrigerants. Their webinars provided useful context as BRING integrated refrigerant-focused work into their programs.
- The [Minnesota Technical Assistance Program](#) (MnTAP) at the University of Minnesota offers a range of programs to support emissions reduction and energy efficiency work in various business sectors. Learning about a refrigerant-management pilot project with food processors provided a useful blueprint for shaping BRING's own work.
- The [Oregon Applied Sustainability Experience Internships](#) through Oregon State University pairs highly qualified interns with businesses to achieve sustainability goals. BRING hired a mechanical engineering student through an internship to help design community workshops and launch a refrigerant project for food and beverage manufacturers⁶.
- HVAC technician training programs at local community colleges can play a pivotal role in expanding this workforce. BRING plans to expand outreach to [Lane Community College' HVAC technician program](#) to explore opportunities for partnership.

⁶ [Video: BRING OASIS Success Story](#)

This combined approach—strengthening internal knowledge while building strategic technical partnerships—helped BRING develop more robust refrigerant-focused programming and offers a model that other jurisdictions can adapt.

II. Convening Key Stakeholders

Convening key stakeholders—including local businesses, government agencies, community organizations, education institutions, and the local utility—is an effective way to begin local conversations on refrigerant management. This helps identify needs and priorities, while building partnerships that can support future work.

Local Refrigerants Roundtable

As guided by Eugene’s Action F4 (see *Refrigerants in Climate Action Plans* section), the City of Eugene convened a regional roundtable in 2021 with local partners and businesses to discuss refrigerants. The goal was to raise awareness about recent federal regulations⁷, understand challenges, and identify solutions. The roundtable produced two key resources: the [City of Eugene Guide to Refrigerants Management](#) and a one-pager [Managing Refrigerants](#). Through the roundtable, key participants highlighted major challenges and opportunities that helped to guide future work.



Cities may consider identifying large governmental partners, as well as businesses or building owners who are significant users of refrigerants. Convening these stakeholders early in the process helps build shared understanding, align priorities, and clarify next steps before formal work begins.

III. Taking Action

The ultimate goal is to develop programs and projects that lead to reducing emissions from refrigerants. This may include a variety of approaches depending on funding, capacity and partnerships. Regional partners in Eugene have started to take action through the approaches described below, many of which can be replicated or adapted in other areas.

⁷ [Environmental Protection Agency, American Innovation and Manufacturing Act 2020](#)

Targeting Public Institutions

Public institutions, including cities, counties, educational institutions and other public partners, can partner with their own internal facilities maintenance staff to identify opportunities to reduce refrigerant leakage within their own buildings and facilities. City of Eugene sustainability staff partnered with the facilities division to develop a process for tracking the types and quantities of refrigerants used in various equipment, along with annual refrigerant recharge volumes. Ongoing tracking will provide accurate measures of refrigerant leakage and recharge within city facilities and equipment, helping identify where improved maintenance practices or equipment upgrades can reduce refrigerant release. Similar efforts have been explored at the University of Oregon and Eugene Water & Electric Board (EWEB). Over time, the resulting data can strengthen long-term planning, budgeting, and equipment decisions, while also setting an example for other organizations and building owners for how to effectively manage refrigerants.



Targeting Specific Business Sectors

Efforts to support specific business sectors that are large refrigerant users or have limited resources to manage equipment are critical for reducing emissions associated with refrigerants. BRING and the City of Eugene have launched two pilot projects to support specific business sectors with refrigerant management. Helping businesses prevent refrigerant loss provides direct benefits to businesses, including reduced energy use and energy costs.

Food and Beverage Manufacturing:

BRING launched a pilot project in 2024 to help food and beverage manufacturers, particularly breweries, improve refrigeration systems and implement energy efficiency upgrades^{8,9}. BRING reached out to 14 food and beverage manufacturers with information about refrigeration best practices and provided customized recommendations based on their existing equipment and needs. Recommendations centered on performing basic maintenance to refrigeration and cooling equipment, replacing refrigerant when possible, and upgrading to newer equipment, with estimates about potential energy, cost and emissions savings.

⁸ [BRING, Food and Beverage Manufacturing Flyer](#)

⁹ [2025 OASIS Final Report by Robin Henry](#)

Convenience Stores:

The City of Eugene and BRING partnered to develop a project focused on convenience stores who often rely on older equipment, operate long hours, and experience frequent door openings, all of which contribute to refrigerant loss and high energy use. Many also have limited capital and are located in underserved communities, creating opportunities for equity-focused benefits. BRING reached out to fifteen convenience stores to provide information about HVAC and refrigeration maintenance best practices¹⁰. Three stores became Rethink certified, received an energy audit, and received funding to complete equipment maintenance, upgrades, and refrigerant replacement, resulting in a reduction of 23.28 MTCO₂e and annual energy cost savings of \$3,866.68. For more information view Appendix A.



Targeting Households

Community workshops are one way to educate residents about basic maintenance practices at the household level that can help reduce refrigerant loss. BRING hosted a “Keep it Cool” workshop in 2025 to educate residents on proper appliance maintenance^{11,12}. 8 attendees learned how to clean coils and condensers, change air filters, and recognize signs for maintenance or replacement on common households appliances. BRING plans to make this workshop a regular offering by adding it to their rotating suite of Do-it-Yourself (DIY) classes. By offering community workshops, cities can engage residents directly in practices that reduce refrigerant leakage and complement larger policy initiatives.



¹⁰ [HVAC Maintenance, Standard Operating Procedures](#)

¹¹ [Keep it Cool, Workshop Flyer](#)

¹² [Keep it Cool, Workshop Slides](#)

Appliance Collection at Transfer Stations

Developing a regional system for households to properly dispose of appliances is essential to prevent refrigerant loss when appliances are landfilled or scrapped. This includes establishing a reliable drop-off or collection system and identifying a qualified partner who can decommission appliances by safely recovering refrigerants before disposal. Two regional agencies who attended the roundtable (see *Local Refrigerants Roundtable* section), Lane County Waste Management and St. Vincent de Paul, have built such a partnership. Households can drop off household appliances such as refrigerators, freezers, air conditioners and wine coolers at Lane County transfer stations for a small fee, after which St. Vincent de Paul will perform the work to safely recover the refrigerant. By developing similar systems and partnerships, other cities can create a more responsible end-of-life disposal pathway for appliances in the region.



Purchasing Refrigerant-Related Carbon Offsets

Many cities and companies have established carbon neutral goals and often supplement efforts to reduce internally produced emissions with the purchase of carbon offsets to meet these goals. This creates an opportunity for organizations to select offsets that specifically address refrigerant emissions. For example, the City of Eugene established a goal of achieving carbon neutrality for city operations by 2020. While efforts continue to prioritize reducing direct emissions from local operations, the purchase of carbon offsets has helped the City meet its carbon neutral goals. Eugene currently buys a portion of offsets from a certified refrigerant-destruction facility, which offers the advantage of permanently eliminating emissions—unlike some offset types, such as reforestation projects, which carry long-term uncertainty. Other cities may consider choosing refrigerant-related offset projects as an additional strategy to support global efforts to reduce high-impact refrigerant emissions.

Future Opportunities

Below are future opportunities that regional partners in Eugene may pursue as resources, partnerships, and funding allow. Many are early concepts captured here to document brainstormed

ideas and offer further approaches for communities to consider beyond those described in the previous section.

- **jFreezer upgrades with small food retailers:** Freezer replacement at small food retailers represents a strong opportunity for a targeted pilot project. Many underserved small food businesses—including meat markets, restaurant-grocery combination shops, and convenience stores—rely on very old freezers that use outdated and harmful refrigerants. Upgrading to newer, more efficient models can also deliver substantial kilowatt and energy cost savings. A new partnership BRING has formed with a restaurant supply company could support a local effort by providing access to slightly used but far more efficient models.
- **Vehicle junkyards:** Vehicle junkyards represent a significant opportunity to improve refrigerant recovery from end-of-life vehicles. Because many cars are crushed without removing the refrigerant from their air-conditioning systems, these facilities serve as single source points where large volumes of refrigerant are released. A pilot project could focus on partnering with yard operators and establishing coordinated systems and processes to ensure refrigerants are properly removed before vehicles are scrapped.
- **Refrigerants roundup:** Roundups are no-questions-asked, free collection locations or days where people can bring in appliances, canisters, tanks, or other refrigerant-containing equipment to be safely handled and disposed of at no charge. Roundups may be geared towards collecting household appliances or they may also be geared towards technicians, as a place for them to drop off recovered refrigerant and coordinate on broader efforts like selling reclaimed refrigerants or exploring opportunities in carbon credits. Regional roundups can be opportunities to safely prevent venting, while also offering great data insights as to the amount and type of refrigerants that are in our community.
- **Identify and track regional metrics:** Metrics such as the amount (in pounds) and types of refrigerant recovered are valuable for measuring impact and success. Additional metrics include tracking the number of household appliances collected at the transfer station as well as the types of equipment, systems and refrigerants are used by businesses. This can help provide better understanding of what types of refrigerants are in the community and where to prioritize efforts.
- **Continued regional collaboration:** The most powerful opportunity to support the refrigerant transition is continued collaboration among business owners, industry leaders, regional partners, government, and community members. Shared learning around pilot program results, equipment and maintenance costs, tracked metrics, equipment decision-making, and energy use outcomes are vital to build confidence in refrigerant management and transition strategies.
- **State legislation:** Federal regulations targeting refrigerants such as the AIM Act have been weakened due to changes in federal priorities. Washington, California, and other states are

moving ahead with regulations of their own. A legislative strategy could be developed to achieve similar regulations in Oregon.

- **Workforce development:** Workforce development presents a major opportunity to strengthen the refrigerant and HVAC sector, especially as cooling demands are expected to rise with a warming climate. Potential ideas have included partnering with Lane Community College's HVAC technician program to enhance curriculum and explore collaboration, supporting local technicians in attending [NASRC's Training Events](#) that are geared toward the trades; and developing a "low hanging fruit" job corps trained to handle routine maintenance and minor repairs—which would free up highly in-demand technicians to focus on more complex jobs.
- **Carbon credits and refrigerants:** Generating carbon credits can potentially offer businesses and technicians a new income stream. A regional project could collect old refrigerants through building retrofits, roundups, and local partnerships, then convert those recovered volumes into carbon credits through certified destruction. Credits can also be earned by installing equipment that uses climate-friendly refrigerants. [Therm](#) and [Tradewater](#) are two reputable companies that can provide carbon credits to businesses who transition to climate-friendly refrigerants, reclaim, or destroy refrigerants. They also sell carbon credits to governments and corporations looking to offset their emissions.

Helpful Resources

This section provides an overview of key organizations working regionally or nationally to address refrigerant emissions, as well as useful resources that they have published or that have been referenced throughout this document.

- North American Sustainable Refrigeration Council (NASRC)
 - [Natural Refrigerants Fact Sheet](#)
 - [Why it Matters](#)
- Refrigerant Emissions Eliminations Forum (REEF)
 - [Frequently Asked Questions](#)
- Yale Carbon Containment Lab
 - [Managing Refrigerants in a Warmer World](#)
- Natural Resources Defense Council
 - [The 90 Billion Ton Opportunity. Lifecycle Refrigerant Management](#)
- Project Drawdown
 - [Solutions: Refrigerant Management, Technical Summary](#)
- Environmental Investigation Agency
 - [Search Reuse & Destroy: Initiating Global Discussion to Act on a 100 Billion Ton Climate Problem](#)

Appendix A: Case Study, Convenience Store Pilot Project

Project Overview

In 2026, the City of Eugene and BRING launched a pilot project to provide technical assistance and funding to help convenience stores maintain and upgrade their cooling and refrigeration equipment. The goal was to reduce emissions from refrigerants—chemical compounds used in HVAC systems, walk-in coolers, freezers, and household appliances that become highly potent greenhouse gases when leaked or improperly handled.

Convenience stores were selected because they often rely on older equipment, operate long hours, and experience frequent door openings, all of which contribute to refrigerant loss and high energy use. Many also have limited capital and are located in underserved communities, creating opportunities for equity-focused benefits.

The City of Eugene served as fiscal sponsor while BRING managed implementation. BRING contacted 15 convenience stores with information and resources on reducing refrigerant leaks and opportunities through the Rethink Business Program. Three stores with significant maintenance needs agreed to participate in an energy audit, pursue Rethink Certification, and receive funding for equipment maintenance, upgrades, and refrigerant replacement.

Funding Sources

The project was funded through a combination of funding from the following sources:

Funding Source	Corner Market	Gilbert Street Market	Tom's Market	Total
Urban Sustainability Directors Network (USDN) Catalyst Grant	\$1,690.00	\$2,450.65	\$5,059.35	\$9,200.00
Green Business National Network (GBNN) x Intuit rebates	\$700.00	\$250.00	\$738.21	\$1,688.21
City of Eugene Waste Prevention program	\$218.40	\$789.99	\$377.64	\$1,386.03
Eugene Water & Electric Board (EWEB) rebates	N/A	N/A	\$3,707.00	\$3,707.00
Total	\$2,608.40	\$3,490.64	\$9,882.20	\$15,981.24

Projects Completed

All three convenience stores completed:

- Rethink Certification through BRING;
- Energy audit by EWEB to identify opportunities for energy savings and to develop custom rebate options; and
- Additional projects as described below.

Corner Market & Deli

The Corner Market is a store located on Highway 99, a main highway running through the Bethel neighborhood of West Eugene and the main corridor into Eugene from the north. The store's refrigeration and



freezer units were older and poorly serviced due to just purchasing the store. The technician performed some basic servicing on a small and large walk-in cooler, made a repair to a freezer, and replaced the refrigerant in a smaller cooler.

Project	Cost
Evaporator and condenser cleaning for both walk-in units	\$918.40
Vinyl contact plate retainer on reach-in freezer	\$29.95
Refrigerant replacement and associated tasks	\$1,660.05
Total	\$2,608.40

Gilbert Street Market

Gilbert Street Market is a convenience store located in the Bethel neighborhood of West Eugene, one of the lower income neighborhoods in Eugene. The refrigerators were not functioning optimally due to lapse in ongoing maintenance and doors which were not properly shutting. The walk-in cooler was using M099, more commonly known as Freon, which contains a very high GWP of 2264. The technician repaired cooler doors, performed basic servicing on the walk-in cooler, and replaced the refrigerant with a next-generation alternative: R-448a refrigerant with a GWP of 1387.



Project	Cost
Evaporator and condenser cleaning	\$673.90
Door closing fix: torque rod replacement	\$116.09
Refrigerant replacement and associated tasks	\$2700.65
Total	\$3,490.64

Tom's Market

Tom's Market is a convenience store located in the West University neighborhood, primarily serving students and the University of Oregon community. Basic servicing and minor repairs were completed on the walk-in cooler, with some repairs costing as little as ~\$20 expected to yield significant savings in energy use. The store plans to combine and replace their walk-in coolers in 2027, which ruled out refrigerant replacement for the unit. However, the store received two newer freezers to replace one older unit that was highly inefficient and had likely been leaking a considerable amount of refrigerant. The refrigerant in the old freezer unit, R-409A with a GWP of 1585, was safely removed. With two freezers instead of one, the store could set different storage temperatures for food and ice. The freezer switch alone contributed to a reduction of roughly 9 MTCO₂e due to higher efficiency and lower GWP refrigerant, highlighting this as a significant intervention opportunity.



Project	Cost
Evaporator and condenser cleaning	\$918.40
Torque rod replacement on 3 doors	\$19.80
Two used freezers, including removal of old unit	\$7,450.00
Electrical work for freezer upgrade	\$1,175.00
Refrigeration evacuation to unhook old freezer: 7 pounds of R-409A	\$319.00
Total	\$9,882.20

Project Impact

Staff attempted to capture the savings achieved through this pilot project, including savings from both refrigerant replacement projects and energy efficiency projects, kWh savings, and energy cost savings for businesses. kWh reductions were calculated using the Oregon Department of Environmental

Quality [Electricity Carbon Intensity Values for 2026](#). Refrigerant emissions reductions were calculated using the Intergovernmental Panel on Climate Change (IPCC) [Metrics and Methodologies](#).

<i>Project Savings</i>	Total Cost	Annual Cost Savings (rate of \$0.092/kWh)	kWh Saved Annually	Estimated Emissions Reduction from Energy Efficiency Projects	Estimated Emissions Reduction from Refrigerant Replacement	Total estimated GHG reduction
Corner Market & Deli	\$2,608.40	\$1,120.63	11,553 kWh	5.39 MTCO2e	0.39 MTCO2e	5.78 MTCO2e
Gilbert Street Market	\$3,490.64	\$890.05	9,176 kWh	4.02 MTCO2e	3.73 MTCO2e	7.75 MTCO2e
Tom's Market	\$9,882.20	\$1,856.00	19,137 kWh	8.36 MTCO2e	1.39 MTCO2e	9.75 MTCO2e
Totals	\$15,981.24	\$3,866.68	39,866 kWh	17.77 MTCO2e	5.51 MTCO2e	23.28 MTCO2e

In total, the project leveraged \$15,981.24 to achieve a reduction of 23.28 MTCO2e in emissions, resulting in cost savings of \$3,866.68 and energy use savings of 39,866 kWh for three local businesses. The total return on investment was \$686.47 per MTCO2e.

Methodology for calculating emissions reduction:

The project used the Oregon Department of Environmental Quality [Electricity Carbon Intensity Values for 2026](#) to report the reductions in kWh. For the refrigerant emissions reductions, the project used the Intergovernmental Panel on Climate Change (IPCC) [Metrics and Methodologies](#) based on the GWP and leak rate estimates.

Lessons Learned

- Ongoing maintenance is essential to ensure optimal equipment performance and efficiency. However, many businesses only schedule repairs if something breaks. The cost of parts and labor have also increased significantly over the past years, making ongoing maintenance harder for businesses to afford. Rebates and incentives are critical.
- Small businesses need individualized support and hand holding to complete projects. Many are too busy managing day-to-day operations to prioritize longer term equipment needs. A project manager is often needed to coordinate the work in small businesses, which should be included as a budget item in funding requests.
- Businesses are sometimes required to complete annual maintenance on equipment by their liability insurance policy.
- In sectors that rely on long-standing relationships with their service technicians, trust and technician approval are often prerequisites for business participation.

- Scheduling with HVAC technicians became challenging as hot weather increased demand for HVAC technicians. Grant-funded projects with strict funding or reporting timelines may benefit from planning projects during colder months.
- Developing resources for refrigerant technicians may make it easier for them to comply with regulations. For example, a lending library model for specialized equipment, such as leak detectors or refrigerant recovery tools, could help technicians access tools that are expensive or not readily available. Additionally, establishing a centralized collection site where technicians can drop off recovered refrigerant would save them from having to deal with resale or disposal.
- Some technicians may vent refrigerants instead of recovering them. As the AIM Act phases down production of high-GWP refrigerants, recovered refrigerant will become increasingly valuable because it can be processed and resold, creating an income opportunity that many technicians may not be aware of.

Maintenance and Upgrade Projects and Photos

The following photos illustrate a variety of projects that were completed in the convenience stores.

Evaporator and Condenser Cleaning

Technicians cleaned fans, fins, and coils to improve airflow and reduce strain on refrigerator systems. Regular cleaning helps equipment run efficiently and reduces the likelihood of refrigerant leaks.



Cleaning evaporator fans, Gilbert Street Market



Before and after cleaning evaporator fins, Tom's Market

Refrigerant Replacement:

Where possible, older, high-GWP refrigerants were safely recovered and replaced with next-generation alternatives. This reduces potential of climate impact when systems leak and helps systems operate more reliably.



Replacing refrigerant on a walk-in cooler, Gilbert Street Market

Repairing Basic Components

Simple repairs—like fixing torque rods or improving gasket seals—ensure doors close fully, preventing unnecessary compressor cycles and reducing energy use. Many of these tasks can be very low cost in comparison to other maintenance tasks, while also yielding significant energy use and energy cost savings.



Replacing gaskets on fridges to improve door seals, Gilbert Street Market



Replacing torque rod screws on fridges to ensure doors fully close, Tom's Market

Equipment Replacement

Sometimes the best option is to upgrade to newer equipment, especially when existing systems aren't suitable for refrigerant replacement and maintenance can't restore proper functioning. For small retail locations, choosing newer, used equipment can be a cost-effective path to improved performance.



Old freezer before replacement and new freezer units installed, Tom's Market