As we wait for everyone to join, please answer the following in the chat:

- What is the name of the municipality (Town, Village, City) that you are joining us from?
- What is the population size of your municipality?
- Municipal Staff/Leadership: Do you have any staff who work on air conditioning or refrigeration equipment? If so, how many staff?
- Have you ever heard of a Coolest Recycling Drive?

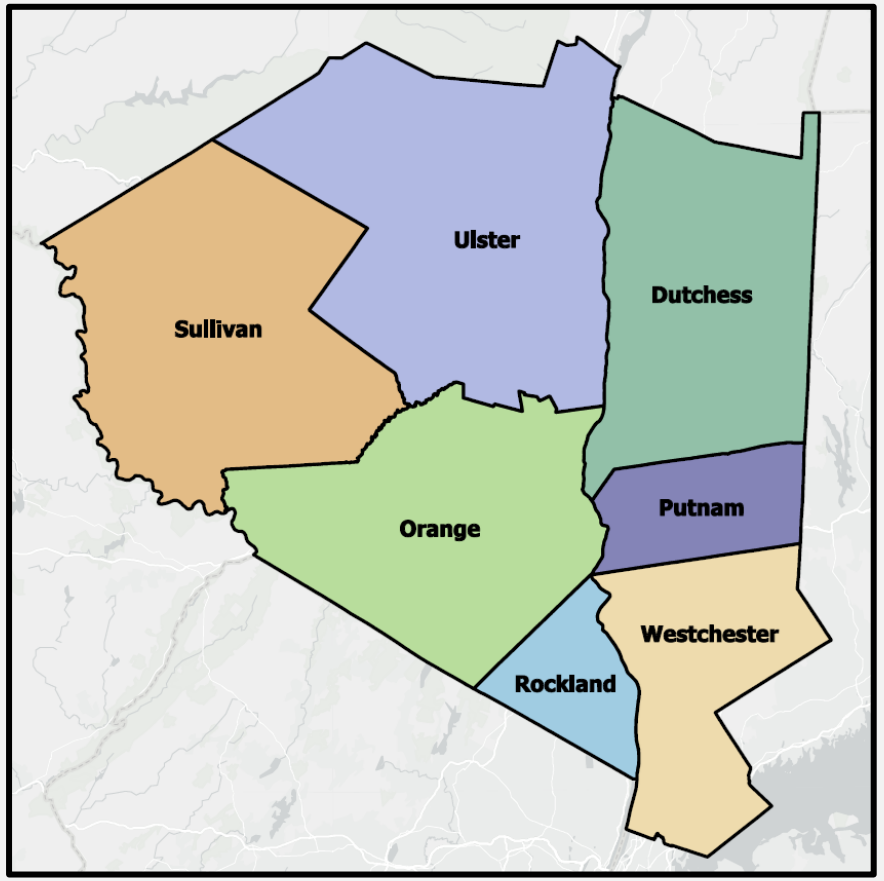
How to Develop a Municipal Refrigerant Management Plan

May 18, 2026

Hudson Valley Regional Council | NEW YORK STATE | NYSERDA | NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation | NEW YORK STATE | Climate Smart Communities

HVRC Regional Initiatives

- US DOC Economic Development Administration
- US EPA Climate Pollution Reduction Grant Program
- US EPA Rural, Small, Tribal Wastewater Program
- NYS DEC 604(b) Water Quality Planning Program
- NYSERDA Clean Energy Communities Program
- NYS Climate Smart Communities Program
- HVRC Climate Action Planning Institute - Adaptation (HREP/ NEIWPCC)
- Regional Platforms
  - Materials Management Working Group
  - Mid-Hudson Regional Sustainability Coalition



CSC Technical Assistance

Registration/Restart Support

- Presentation to CAC, CSC Task Forces, or Municipal Boards
- CSC Action Checklist Spreadsheet

Certification Support

- One-off Questions about Actions or Process
- Final CSC Certification Application Review

HVRC Climate/Clean Energy Support

Liz Sun, Senior CEC&CSC Coordinator

CEC & CSC technical assistance to municipalities in Putnam and Westchester Counties.
esun@hudsonvalleyrc.org

Brandon Toye,
CEC&CSC Coordinator

CEC & CSC technical assistance to municipalities in Dutchess and Rockland Counties.
btoye@hudsonvalleyrc.org

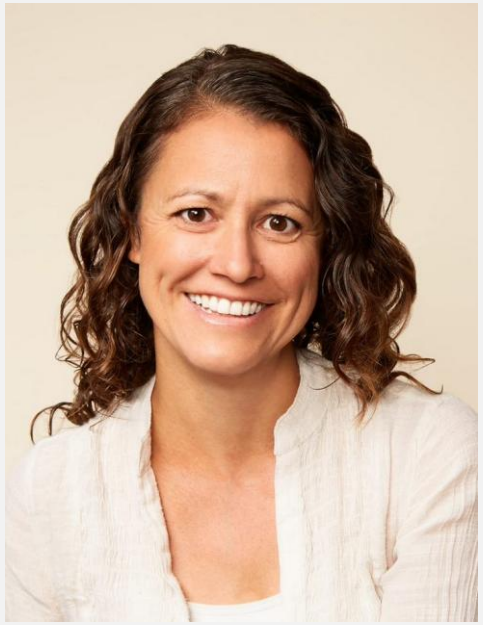
Evelyn Laferriere, CEC&CSC Coordinator

CEC & CSC technical assistance to municipalities in Orange, Sullivan, and Ulster Counties.
elaferriere@hudsonvalleyrc.org

Sofie diTommaso,
Resilience & Adaptation Coordinator

Supports climate vulnerability and adaptation planning for local governments in the region.
sditommaso@hudsonvalleyrc.org

Today's Presenters



Julie Noble,
Sustainability Coordinator for the City of Kingston.

Michael Helme,
Lead Volunteer for New Yorkers for Cool Refrigerant Management.

Philip Schoettle-Greene,
Environmental Specialist, City of Kingston.

Hudson Valley Regional Council

Moderators:
Evelyn Laferriere, HVRC
Jessica Dupont, SHV

How To: Municipal Refrigerant Management Plan

LESSONS FROM KINGSTON NY

Kingston Climate Milestones

2007 — Environmental Educator #1 Hired

2008 — Environmental Educator #2 Hired

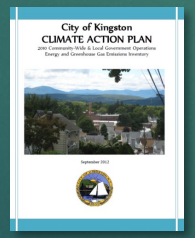
2009 — Kingston Conservation Advisory Council (CAC) Formed

2010 — Climate Smart and Green Jobs Community Pledge Adopted; Climate Smart and Green Jobs Task Force Formed

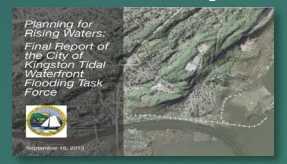
2011 — Climate Analyst Hired

2012

2013 — Climate Action Plan Adopted



2013 — *Planning for Rising Waters* Plan Adopted



2014 — Certified Bronze Climate Smart Community

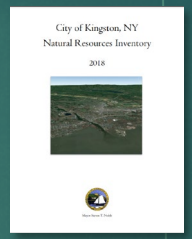
2015 — Sustainability Coordinator &Climate Smart Kingston Commission Appointed

CLIMATE SMART KINGSTON

2016 — Designated 1st City as Clean Energy Community

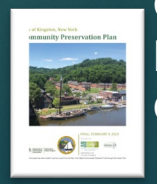
2017 — Environmental Specialist Hired

2018 — Natural Resources Inventory Adopted

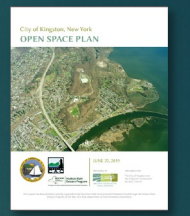


2019 — 1st City Certified Silver Climate Smart Community

2020 — Re-Certified Silver Climate Smart Community



2020 — Open Space Plan Adopted



2021 — Community Preservation Plan Completed

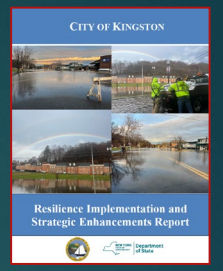
KINGSTON CLIMATE ACTION PLAN 2030

2022 — CPF Adopted

2023 — DOE SolSmart Bronze Designation

SOLSMART
NATIONALLY DISTINGUISHED. LOCALLY POWERED.

2024 — Resilience Plan Adopted



2025 — Refrigerant Mgmt Plan Complete

2026

2030

Some Kingston Context

Kingston's Climate Action Plan

Set goals of **GHG emissions reductions** in government operations and city wide.

Establishes that **buildings and facilities** contribute emissions from heating and cooling systems.

Calls out that our **vehicle air conditioning and refrigerant** equipment can leak, causing emissions.

Calls out that **solid waste disposal**, inc. large appliances, could be contributing to refrigerant emissions.

Leadership

Willingness of community and leadership to push the needle and be an environmental leader.

Kingston was one of the first **CSC Silver Certified Communities** in the State.

Climate Smart Kingston Commission has established Refrigerant Management as a Priority since 2019.

City of Kingston Refrigerant Management Plan

2025

Funding provided by NYS DEC Climate Smart Communities Grant Program

Funding

2022 CFA

NYS Department of Environmental Conservation

2022 Climate Smart Communities Funding

Project Budget: $100,000

Grant Award:
$50,000

-Consultant
-Collection Fees

Local Match:
$50,000

-In Kind Staff Time
-Materials

Project GOAL:

The City of Kingston Refrigerant Management Program will:

- Develop a **comprehensive plan** to address municipal refrigerant purchases, management and disposal to reduce GHG emissions.
- Focus on reducing emissions from refrigerants in the **municipal building and fleet portfolio**.
- Focus on reducing emissions from municipal sanitation department collected refrigerant containing **appliances**.

Plan Components

Municipal Refrigerant **Inventory**

Policy, inc. **schedule**, for municipal refrigerant **inventory updates**

Summary of findings of current processes for managing refrigerants in municipal operations, including procurement, maintenance and disposal

Refrigerant **Procurement Policy**

Refrigerant **Maintenance Policy** (including monitoring, repair and disposal (reclamation/recycling/ destruction) by staff and contractors)

Plan for **tracking and reporting refrigerant** purchase, use, repair, disposal (reclamation/recycling/ destruction)

Plan and schedule for **leak detection** and management

Schedule for equipment **evaluation and replacement**

Policy for **selling** refrigerants

Template for annual program **evaluation and reporting**

Staff **Training** Program and associated materials

The Support Team

- NYS Dept. of Environmental Conservation
- New Yorkers for Cool Refrigerant Management
- Sustainable Hudson Valley
- City of Kingston Staff and Elected Officials
  - Sustainability Office
  - Department of Public Works
  - Engineering Office
  - Mayor's Office
- Climate Smart Kingston Commission
- Kingston Conservation Advisory Council
- Climate Action Associates
- E Gartland & Associates LLC
- Refrigerant Emissions Elimination Forum

Kingston Refrigerants Plan Timeline

- Grant Submission July 2022
- Grant Award January 2023
- Grant Contract October 2024
- Consultant RFP April-May 2025
- Consultant Contract June 2025
- Conduct Inventory, Analysis of procedures and policies, Draft Plan, Educational Campaign June-November 2025
- Finalize Plan December 2025
- Staff Training Spring 2026
- Refrigerant Amnesty Days May 2025-2029
- Plan Implementation Spring 2026 and forward

For More Information

Visit

https://kingston-ny.gov/refrigerants

Email

refrigerants@kingston-ny.gov

The City of Kingston, NY

NEW YORKERS for COOL REFRIGERANT MANAGEMENT

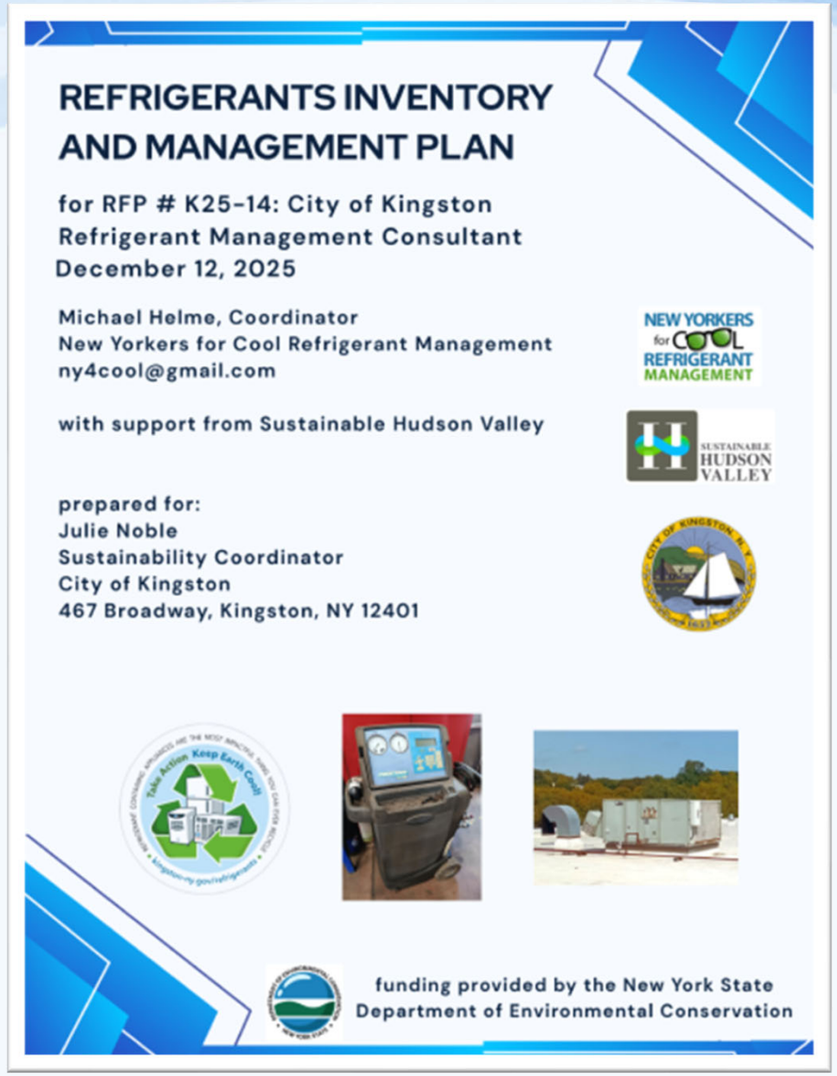
How To Develop a Municipal Refrigerant Management Plan

HVRC and SHV
May 18, 2026

PROJECT DRAWDOWN

2017 Headline:

Refrigerant Management #1 Climate Solution



Get your copy of the report:
ny4cool.org/kingston-refrigerant-report

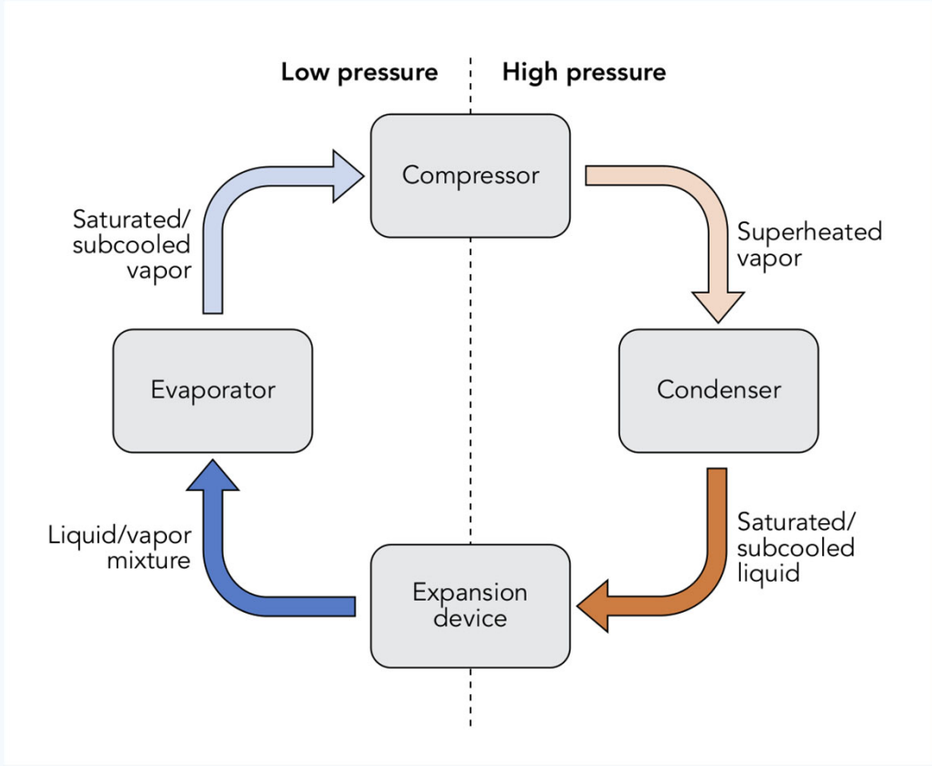
Today's outline

- Refrigerants 101
- Do refrigerants present a significant concern to municipal operations?
- Lessons from
  - Buildings
  - Motor Vehicle Air Conditioning (MVAC)
  - Appliances

Refrigerants are…

An essential ingredient in:

- Refrigerators
- Freezers
- Vending machines
- Ice makers
- Water coolers
- Dehumidifiers
- Air conditioners
- Heat pumps



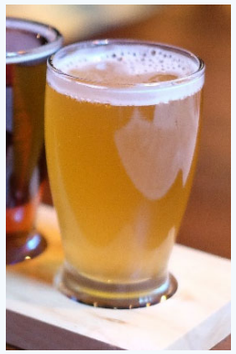
Source: https://commons.wikimedia.org/wiki/File:Vapor_Compression_Cycle.png

Refrigerants are important because…

they can be _____ intense greenhouse gases

***#$%@#$%!**	**stunningly**	**mind-bogglingly**
extremely	**bewilderingly**	**amazingly**
staggeringly	**shockingly**	**unexpectedly**
astonishingly	**extremely**	**incomprehensibly**

A Pint is a Pound, the Whole World Round



1 pound of gasoline + fire → 3.25 Pounds CO_2

3.25 pounds CO_2

1 pound of R410A acts like 4,715 pounds of CO_2

20-year Global Warming Potential (GWP) of R410A = 4,715

Carbon Dioxide equivalent (or CO_2e)

What's a CFC (or HCFC, HFC or HFO)?

Chlorofluorocarbons	
CFC-11	CCl_3F
CFC-12	CCl_2F_2
CFC-13	$CClF_3$

Hydrofluorocarbons	
HFC-23	CHF_3
HFC-32	CH_2F_2
HFC-41	CH_3F

Hydrofluorochlorocarbons	
HCFC-21	$CHCl_2F$
HCFC-22	$CHClF_2$
HCFC-31	CH_2ClF

Hydrofluoroolefins	
HFO-1234yf	$CF_3CF=CH_2$
HFO-1336mzz(E)	(E)-$CF_3CH=CHCF_3$
HFO-1336mzz(Z)	(Z)-$CF_3CH=CHCF_3$

Natural Refrigerants

	Common Name	Sample Uses
R290	Refrigerant-grade propane	Refrigerated cases; heat pumps (but not in the US)
R744	Carbon dioxide	Commercial refrigeration; heat pump water heaters
R600A	Isobutane	Residential refrigerators
R717	Ammonia	Ice Rinks

See naturalrefrigerants.com for information and articles on the widespread use of these refrigerants.

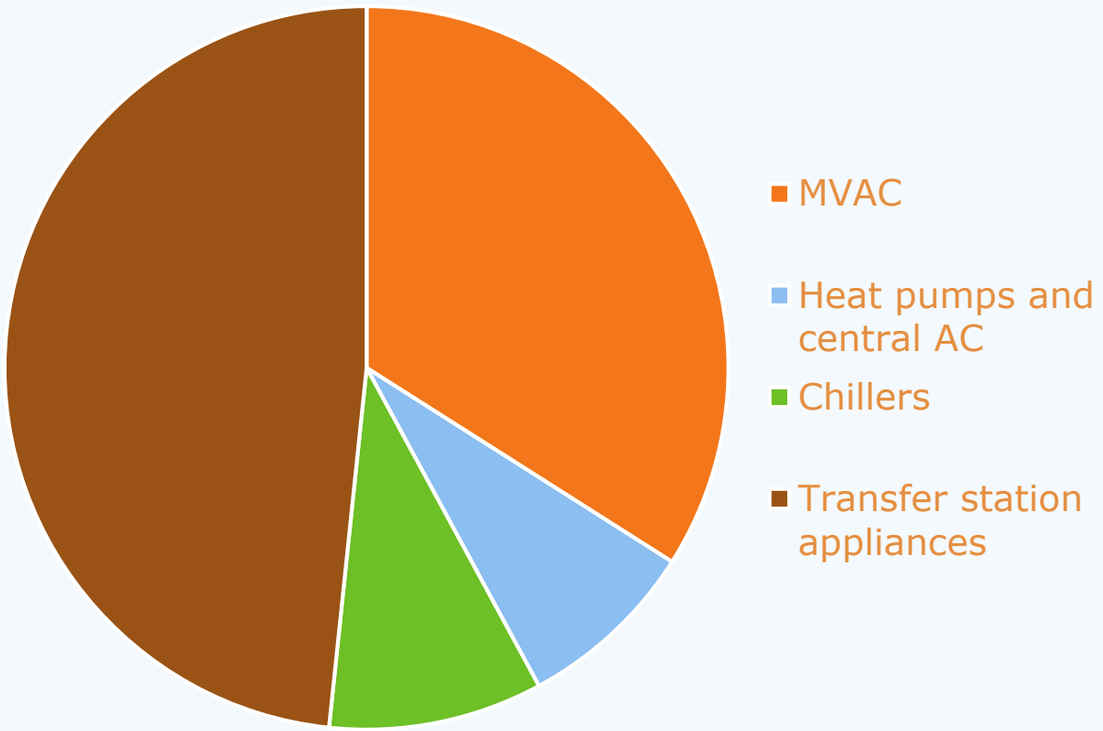

Do refrigerants present a significant concern to municipal operations?

Kingston's refrigerant bank

Refrigerant	Class	ODP	GWP100 (AR4)	GWP20 (AR6)	Total Pounds	CO_2e GWP100 (pounds)	CO_2e GWP20 (pounds)	Count
R12	CFC	0.820	10,900	12,700	3.2	35,023	40,807	7
R134a	HFC	0.000	1,430	4,140	509.7	728,827	2,110,030	234
R22	HCFC	0.055	1,810	5,690	496.3	898,308	2,823,963	27
R32	HFC	0.000	675	2,690	15.3	10,349	41,244	22
R404A	HFC	0.000	3,922	7,208	5.4	21,179	38,923	1
R410A	HFC	0.000	2,088	4,715	121.8	254,289	574,358	51
R600A	HC	0.000	3	0	2.0	6	0	33
R290	HC	0.000	3	0	2.7	8	0	9
R513a	HFC/HFO	0.000	630	1,823	1.3	837	2,421	5
R1234yf	HFO	0.000	4	2	90.5	362	164	48
No Label								12
Total (pounds)					**1,247.2**	**1,949,184**	**5,631,908**	**449**
Total (MT)						**884**	**2,555**	

Where were Kingston's refrigerant emissions?

Refrigerant Emissions in 2025
(MT CO_2e GWP20)



Refrigerant	GWP20 Emissions (MT CO_2e)	Equipment Types
HFC-R134a	185	MVAC
HFC-R410A	44	Heat pumps and central AC
HCFC-R22	52	Chillers
Various	263	Transfer station appliances
Total	**544**	

Kingston refrigerant bank and emissions

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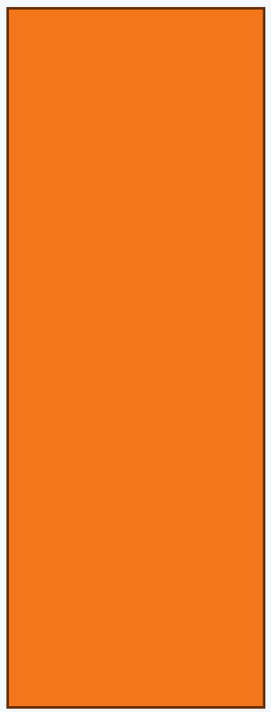
No Label								12
Total (pounds)					1,247.2	1,949,184	5,631,908	449
Total (MT)						884	2,555	

2,555
Metric Tons CO_2e
Kingston F-Gas Bank



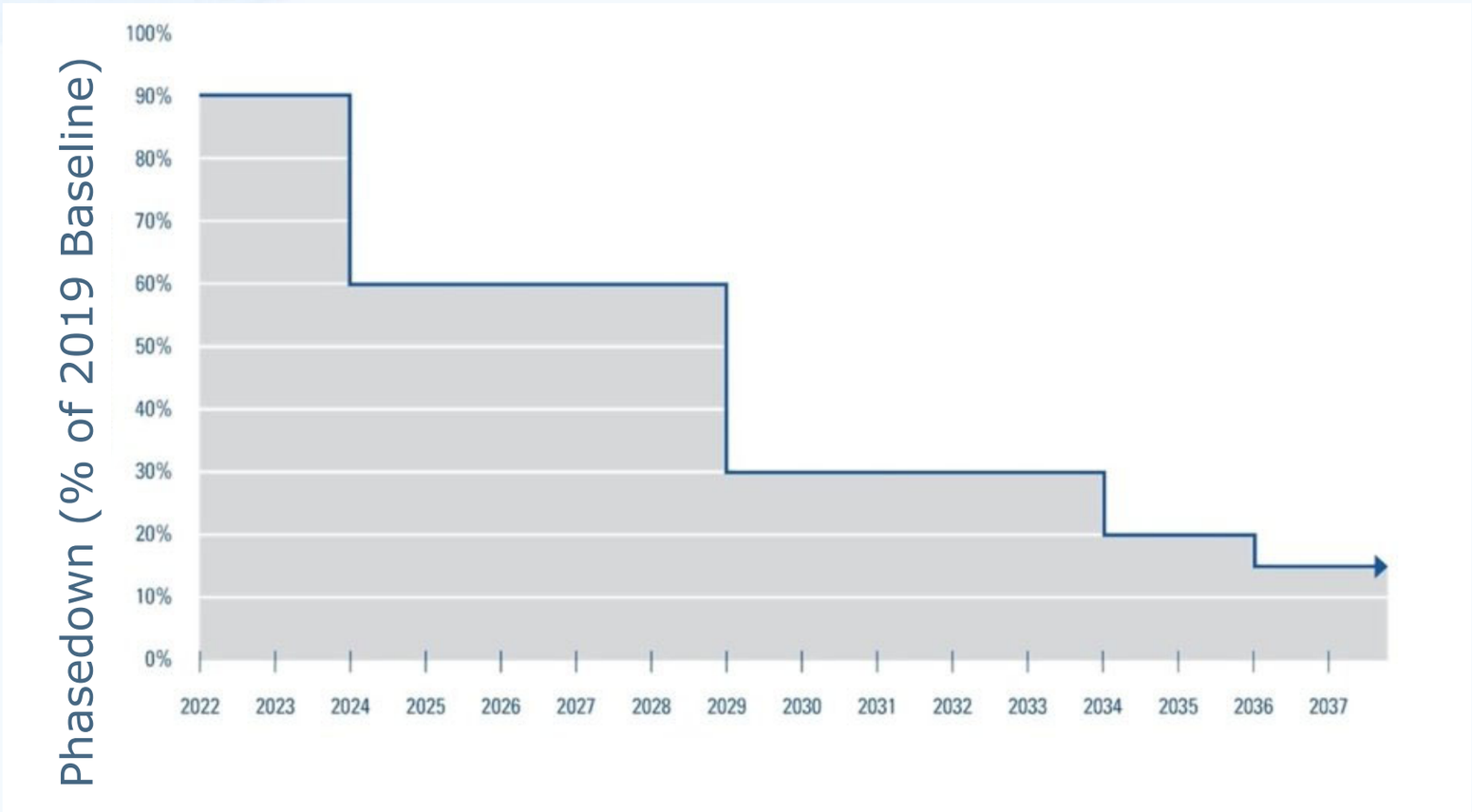
2,504
Metric Tons CO_2e
Municipal Emissions

544
Metric Tons CO_2e
Kingston F-Gas Emissions

A single event in 2023…

- Catastrophic leak of 99 pounds of R22 from chiller
- Emissions?
  - 5,690 [GWP20 of R22] x 99 pounds = 563,310 pounds CO_2e or **255 MT CO_2e**
- Cost?
  - $125/pound x 99 pounds = **$12,375.00**

AIM Act → era of high-priced refrigerants



Reduced supply → higher prices, which incentivize:

- Transition to lower GWP refrigerants
- Leak reduction
- Refrigerant recovery

Source: EPA
https://www.epa.gov/climate-hfcs-reduction/frequent-questions-phasedown-hydrofluorocarbons

Building Refrigerant Emissions

Heating, Ventilation, Air Conditioning, and Refrigeration equipment requires scrutiny

HVACR Manager should oversee

- Regulatory requirements
- HVACR maintenance and upgrades
- Contractor compliance

What regulatory requirements?

Do you have refrigeration, air conditioning or heat pump systems with more than 15, 50, 200 or 1500 pounds of refrigerant?

- ❑ > 15 pounds of HFCs – EPA regulations
- ❑ NYS Part 494 regulations (overview)

Size (pounds)	Registration	Annual Reporting	Equipment Labelling	Record Keeping
50-200	March 2028	n/a	Yes	Yes
200-1,500	March 2026	March 2027	Yes	Yes
> 1,500	March 2025	March 2026	Yes	Yes

Inventory and Maintenance

- Are all departments having regular maintenance performed?
- Do any departments need upgrades?
- Are contractors following applicable regulations?
  - Recovering refrigerants
  - Recording amounts on invoices

Lunch & Learn
Side Dishes Menu

-- Feasibility of automatic leak detection systems

-- Purchasing natural refrigerant systems

-- Working with refrigerant reclaimers

-- Planning for A2L refrigerants

Get all the gourmet details in the report!

Buildings refrigerant inventory benefits

You would know which systems …

- are subject to state or federal regulation
- may have expensive refrigerant needs in the future
- had regular maintenance performed
- may need an upgrade

You would also know if you can fill the HVAC manager role or if your facilities require someone with more expertise.

Motor Vehicle Air Conditioning

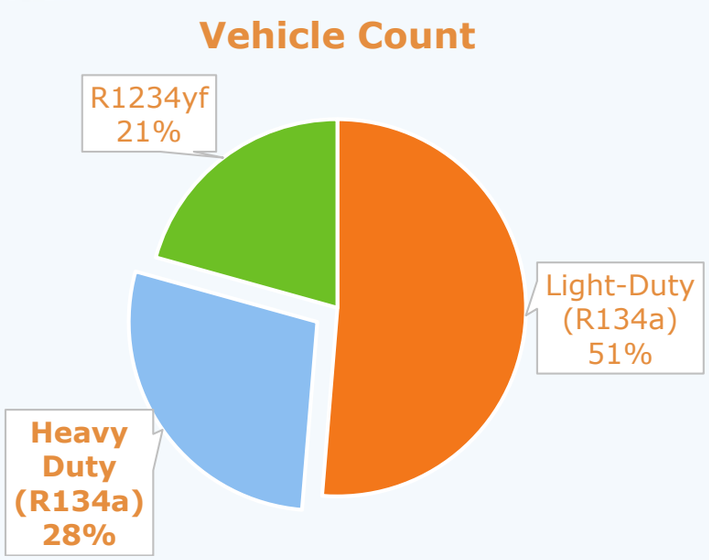
HFC R134a & HFO R1234yf

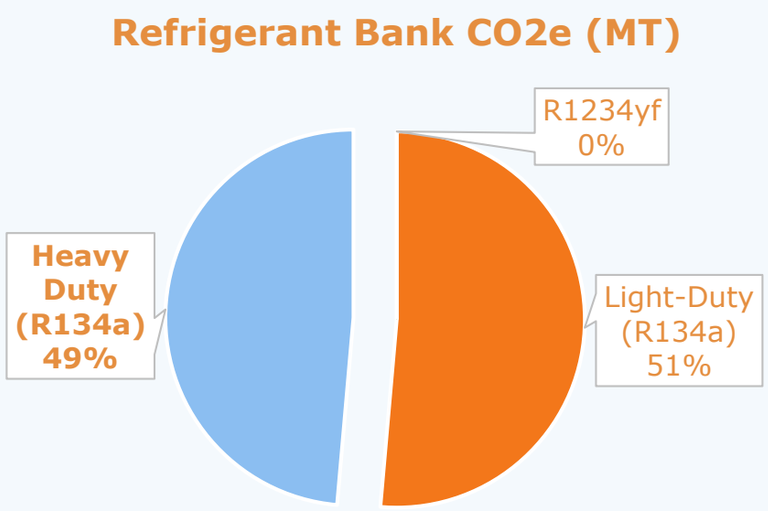
MVAC Refrigerants

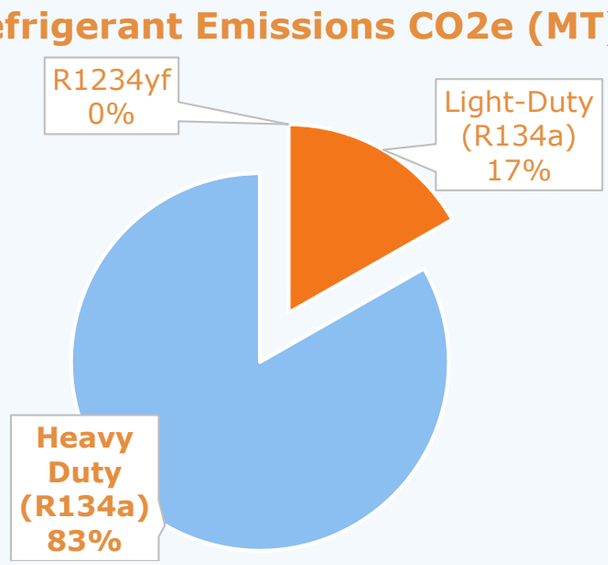
Refrigerant	GWP20	GWP100	TFP	Light-Duty Vehicles	Heavy-Duty Vehicles
R134a	4,140	1,430	21%	Phasing Out	Yes
R1234yf	1.81	4	100%	Phasing In	In 2028

TFA – Trifluoroacetic Acid, a short-chain PFAS molecule
TFP – TFA Formation Potential

Emphasize Heavy Duty Vehicles







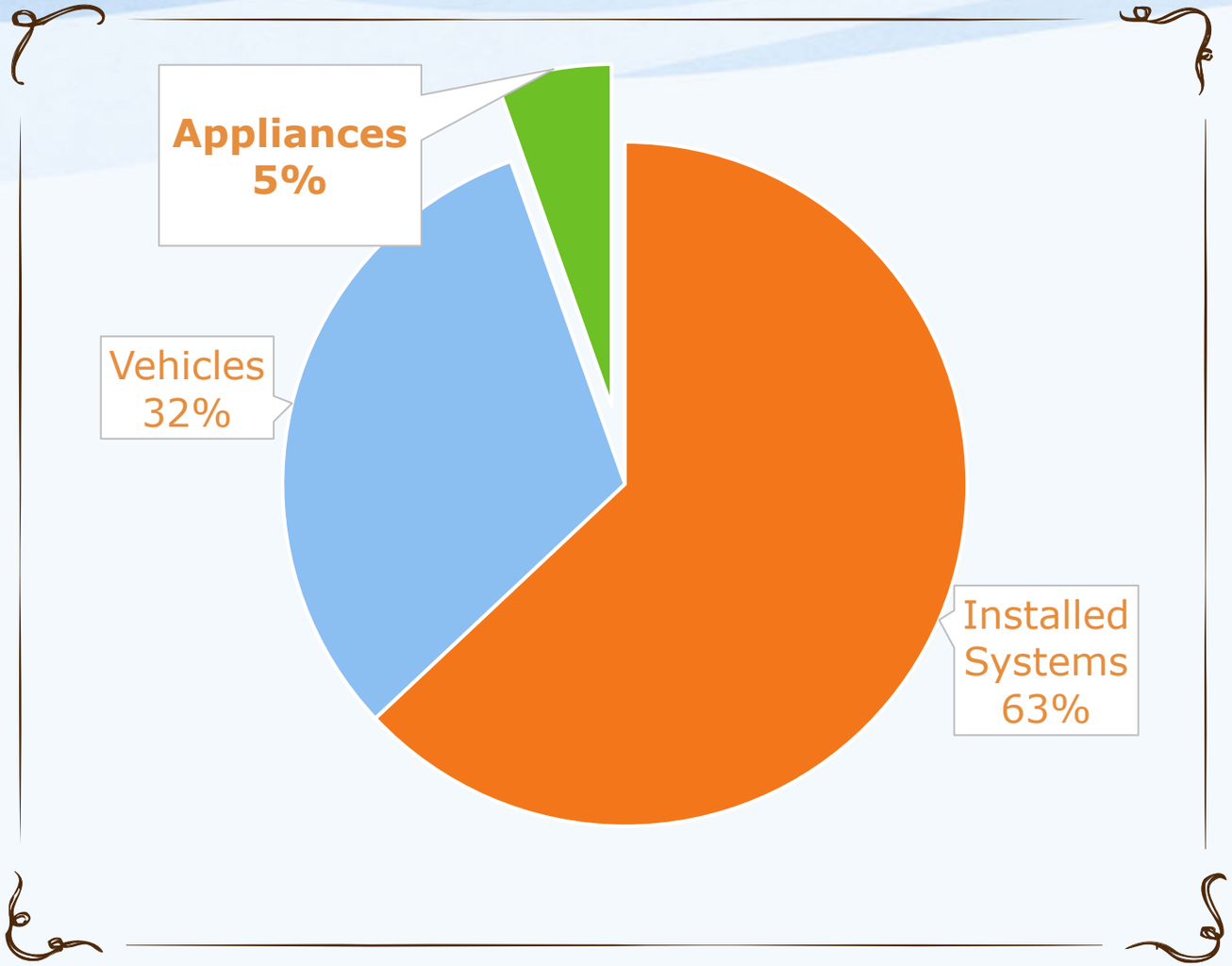
What can be done about MVAC emissions?

Goals for mechanics:

- Track refrigerant use closely
- Use automatic RRR machine effectively
- Proactively monitor for leaks and repair leaks

Federal requirement:

- ❑ Section 609 Certification for mechanics



Appliances

Factory-sealed units that rarely leak

Appliance Recycling Program

Transfer Station

Year	Appliance Count	GWP20 CO_2e (MT)	Recoveries (MT)	Total (MT)
2023	168	249	0	249
2024	180	266	(50)	216
2025 (1/1–10/31)	175	263	0	263
Total	**523**	**778**	**(50)**	**728**

Bring us your tired, your wretched, your worn-out air conditioners, refrigerators, and dehumidifiers!

The COOLEST RECYCLING DRIVE

CRD #	Unit Type	Refrigerant	Charge (ounces on label)	Gas (gallons)
58	Air conditioner	R410A	11.29	170
59	Mini-refrigerator	R12	1.4	57
60	Freezer	R12	6.7	271
61	Air conditioner	R22	17.3	314
62	Air conditioner	R32	10.75	92
63	Dehumidifer	R22	10.75	195
64	Mini-refrigerator	R134a	1.9	25
65	Dehumidifer	R22	14.1	256
66	Dehumidifer	R22	4.95	90
67	Dehumidifer	R22	8.82	160
68	Air conditioner	R410A	12.7	191
69	Air conditioner	R22	7.8	141
70	Air conditioner	R32	9.17	79
71	Air conditioner	R410A	13.78	207
72	Air conditioner	R410A	9.17	138
73	Air conditioner	R22	38.5	698
74	Air conditioner	R410A	9.9	149
75	Air conditioner	R410A	9.88	148
76	Air conditioner	R22	21.5	390
77	Air conditioner	R22	20.25	367
78	Water Cooler	R134a	1.27	17
79	Air conditioner	R22	14.8	268
80	Water Cooler	R134a	1.27	17
81	Air conditioner	R410A	8.82	133

At a conservatively estimated 50% refrigerant recovery rate, recycling 100 appliances can avoid 81 MT CO_2e emissions (GWP20) and cost less than $500.

Robust appliance recycling programs

- Transparency about refrigerant recovery
- Motivated recovery personnel
- Recovered amounts of refrigerants are recorded, converted to CO_2e, announced and celebrated
- Appliance recycling is heavily promoted
- Strategies for getting more appliances, such as annual free days or “pay-what-you-wish” weeks
- Reasonable prices for residents ($10-$15)

Priority Inventory and Action Items

Category	Inventory Needs	Action Priorities
Buildings	Assess all installed systems	Empower a knowledgeable manager; manage large equipment
Motor Vehicles	Emphasize heavy duty vehicles	Track refrigerant purchases; proactive leak detection and prevention
Appliances	Little need to review owned appliances	Create a robust appliance recycling program

Please keep in touch

Michael Helme
NY4Cool@gmail.com

Now That We Have a Plan

Who Will Implement It?

Philip Schoettle-Greene
Environmental Specialist
City of Kingston

First a Shout-out

Jessica Dupont

Special Projects Coordinator
Sustainable Hudson Valley

- Helped complete the city-wide inventory
- Led the community communications campaign

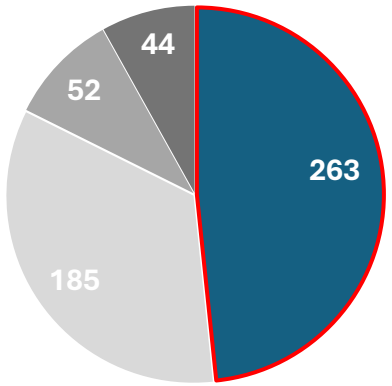
Kingston’s Implementation Team

Ryan Coon

DPW Deputy Superintendent

- Manages transfer station white goods
- Contracting with a certified refrigerants reclamation company

2025 Refrigerant Emissions (MT CO2e)

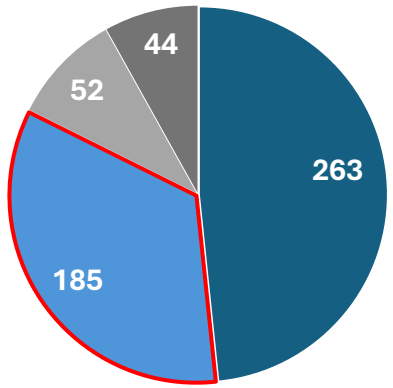


Francis Fagan

DPW Garage Foreman

- Manages municipal dept. of public works garage
- Keeping an eye on AC refrigerant ins and outs

2025 Refrigerant Emissions (MT CO2e)

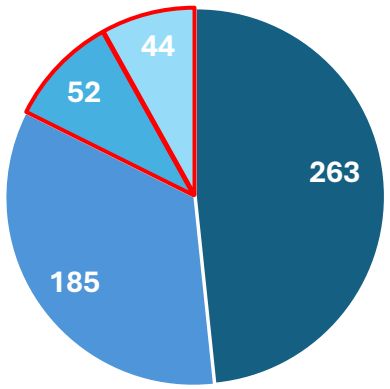


Bradley Borquist

Engineering Aide

- HVAC Manager
- Upgrading HVAC and installing leak detection systems

2025 Refrigerant Emissions (MT CO2e)



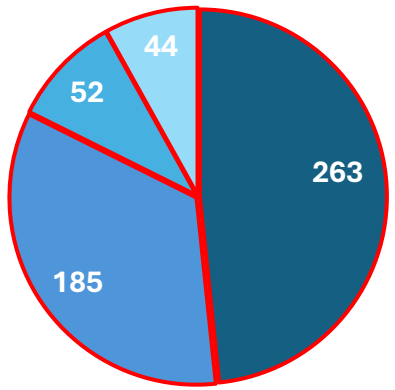
- Transfer Station Appliances
- Motor Vehicle Air Conditioning
- Heat Pumps & Air Conditioning
- Chillers

Philip Schoettle-Greene

Environmental Specialist

- Also the Refrigerants Inventory Manager

2025 Refrigerant Emissions (MT CO2e)



Thanks!

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