



U.S. General Services Administration

Refrigerants are Scope 1 Greenhouse Gases

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presented by

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Agenda Topics

- Why are Refrigerants Important Greenhouse Gases (GHGs)
- Current Status
- Future Impact
- What do we have in process?
- How much do we have to go?

Not So Fun Facts

Global Warming Potentials CO2 1 NO2 273 Methane 34
Refrigerants: R-22 1,800 R-410a 2,100 R-134a 1,300

- Not so fun facts:
 - Canned “Air” might be refrigerant based with GWP
 - 90% of refrigerant leaks take place at equipment end of life
- Equipment may leak 20-30% of their total refrigerant charge and not show obvious signs of reduced performance.

Low GWP Requirements

- Low and Ultra-Low Global Warming Potential Requirements
 - EPA Significant New Alternatives [Policy](#) (SNAP) - Specifies reduced Global Warming Potential [refrigerants](#) of 750 or less
 - GSA [P100](#) Design Standard specifies:
 - Refrigerants with Ultra Low GWP of 10 or less
 - A1 refrigerants - not flammable and low toxicity



GHG Reduction

- Net-zero building emissions
 - 2045 including a 50% reduction by 2032
- Reduce Scope 1 & 2 greenhouse gas emissions
 - Reduce by 65% by 2030 from 2008 baseline
- Building Performance Standard (BPS), Council on Environmental Quality
 - Goal: reduce standard operations Scope 1 emissions
 - Does not include refrigerants



How Big of Deal Are Refrigerants

- 6% of GSA's Total Scope 1 & 2 Emissions
- 4.8% without carbon free electricity (CFE)
- 9.4% of Scope 1 Onsite Emissions
 - combustion + refrigerants

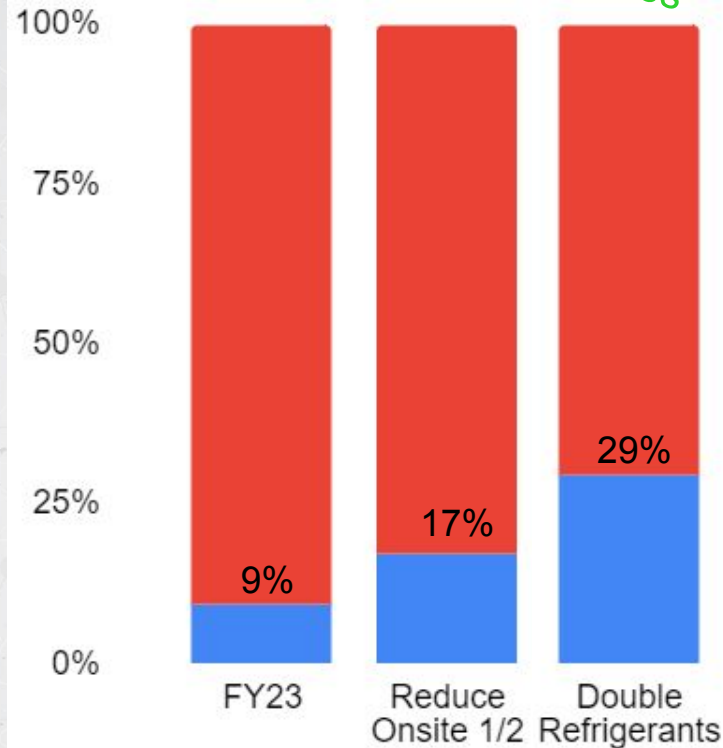


Greenhouse Gases

Refrigerants % Will Grow

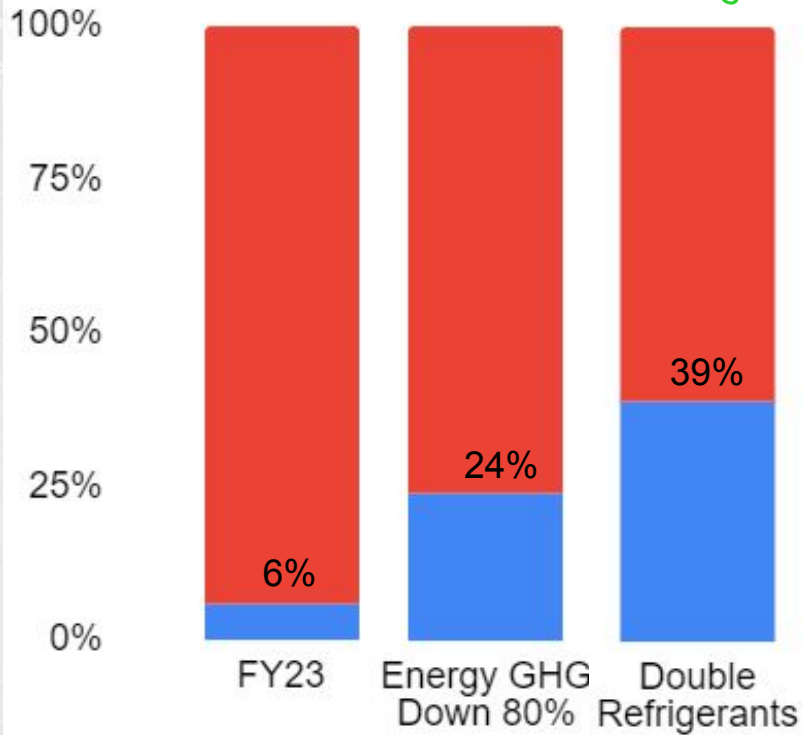
- Electrification reduces onsite emissions
 - Reduces the denominator
- Scope 1 fugitive emissions will increase
 - Increasing the numerator

$$\frac{\text{Refrigerants GHG} \quad +}{\text{Scope 1 GHG} \quad -}$$



Scope 1 Onsite Emissions

Greenhouse Gases



Refrigerants % Will Grow

- Electrification and CFE reduces Scope 1 & 2 - emissions
 - Reducing the denominator
- Scope 1 fugitive emissions will increase
 - Increasing the numerator

$$\frac{\text{Refrigerants GHG}}{\text{Total GHG}} \quad \begin{matrix} + \\ - \end{matrix}$$

Current State

- GSA currently does not track refrigerant leaks centrally
- Refrigerant containing assets have incomplete inventory data
- Annual GHG report to FEMP estimates refrigerant leaks
- Estimation offers no management opportunities
- Over or underestimating actual leak GHG impacts



Challenges

- Unable to strategize on ultra low global warming potential (GWP) refrigerants
- Inability to strategically replace equipment based on refrigerant type, charge, leak rates



In Process

- Improving asset attribute accuracy and completeness
- Working to ensure new asset attributes are uploaded
- Collecting refrigerant charge data on asset work orders
- End of Life Considerations
 - Tracking and Reporting



How Far Do We Have to Go

- 16,026 Refrigerant Containing Assets in inventory
- 9,643 show no refrigerant type
- 10,476 show no refrigerant charge
- 1 building has used new work order meter feature for recharges

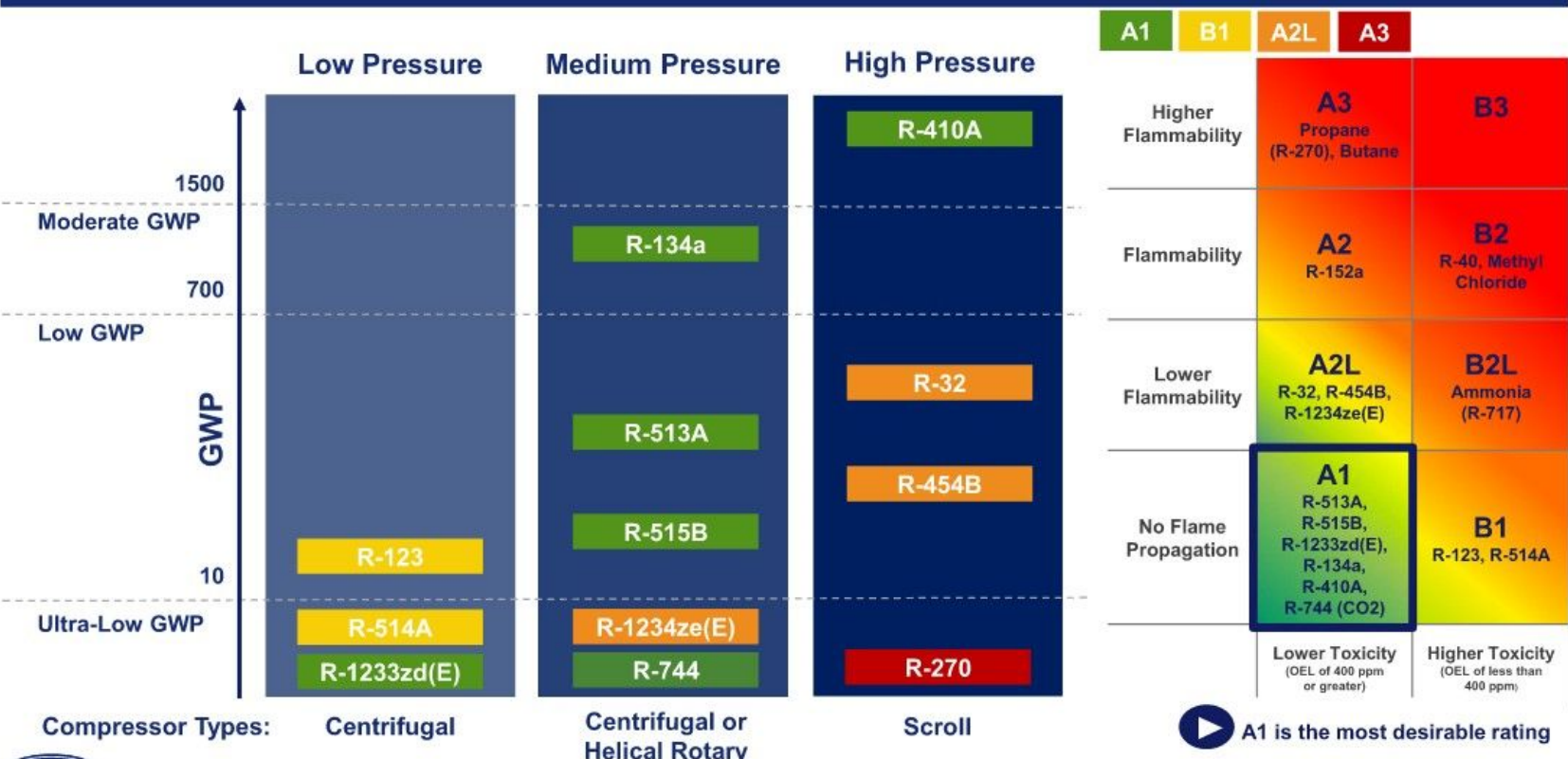


Discussion - What are other agencies doing?



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System Pressure vs GWP and Safety Rating



P100 Chapter 5 Mechanical:

as of" date is in the future. Verify whether state and/or local jurisdictions have refrigerant use limitations in addition to those outlined by EPA SNAP. Refrigerants at or below 10 GWP should be prioritized if listed as "Acceptable" by SNAP. Only A1 Refrigerants are permitted for direct or high probability systems. Any refrigerant other than A1 must be contained within a machinery room complying with ASHRAE 15 and other applicable codes.

GSA Best in Class contracts:

Reference to this FAR 52.223-12 clause stating, among other things, "(c) [Unless otherwise specified in the contract, the Contractor shall reduce the use, release, or emissions of high global warming potential hydrofluorocarbons under this contract by– \(4\) Using reclaimed hydrofluorocarbons, where feasible.](#)" as directed in [white house 2021 fact sheet](#)