

# R-7. Reduce Disposal Emissions



## GHG Mitigation Potential



Up to a 99.9% reduction in GHG emissions during disposal

## Co-Benefits (icon key on pg. 34)

None

## Climate Resilience

Non-applicable

## Health and Equity Considerations

Non-applicable

## Measure Description

This measure reduces emissions from the disposal of refrigeration and A/C equipment at the end of its lifetime. Safe disposal requirements are included in U.S. EPA regulations (40 C.F.R. 82(F)) under Section 608 of the Clean Air Act, as well as under California's Refrigerant Management Program. These requirements are designed to minimize refrigerant emissions when equipment is disposed. Refrigerants must be properly recovered using U.S. EPA-certified refrigerant recovery equipment, meaning that a least 90 percent of the refrigerant must be recovered if the compressor is operating, and at least 80 percent must be recovered otherwise (U.S. EPA 2019).

## Scale of Application

Project/Site

## Implementation Requirements

This measure aims to capture the remaining amount of refrigerant that is not mandated to be recovered. Refrigerants must be reclaimed by an U.S. EPA-certified reclaimer for reuse or destroyed using approved destruction methods (U.S. EPA 2018).

## Cost Considerations

The main cost is labor associated with hiring a technician to complete the recovery work.

## Expanded Mitigation Options

Smaller equipment tends to have the highest disposal leak rates. Target this measure to small equipment to maximize GHG reductions.





## GHG Reduction Formula

$$A = \frac{B - C}{C}$$

## GHG Calculation Variables

ID	Variable	Value	Unit	Source
<b>Output</b>				
A	Percent reduction in GHG emissions from disposal emissions	0–99.9	%	calculated
<b>User Inputs</b>				
B	Improved equipment disposal emissions rate with measure	[ ]	%	user input
<b>Constants, Assumptions, and Available Defaults</b>				
C	Equipment disposal emissions rate without measure	At least 20	%	U.S. EPA 2018

Further explanation of key variables:

- (B) – The improved disposal emissions rate of the equipment after implementation of improved refrigerant recovery technologies.
- (C) – The disposal emission rate of refrigeration and A/C equipment. Refrigerant must be properly recovered using U.S. EPA-certified refrigerant recovery equipment, meaning that at least 80 percent must be recovered (U.S. EPA 2018). This means the regulated disposal emissions rate would be at least 20 percent. The actual achieved-in practice rate may be much higher than this minimum requirement and could exceed 50 percent. The user should replace this default in the GHG reduction formula if they are able to provide a project-specific value.

## GHG Calculation Caps or Maximums

(B < C) In order for implementation of this measure to result in a GHG reduction, the improved equipment disposal emission rate must be less than the 20 percent required by federal and state regulations. For residential equipment, reducing disposal emissions from over 50 percent to 25–30 percent is considered adequate.

## Example GHG Reduction Quantification

The user reduces disposal emissions by implementing more technologically advanced refrigerant recovery systems. The initial disposal rate of the equipment (C) is 20 percent and the improved disposal emission rate with the project (B) is 10 percent. Implementation of this project would reduce disposal emissions by 50 percent.

$$A = \frac{(10\% - 20\%)}{20\%} = -50\%$$



## Quantified Co-Benefits

None.

### Sources

- U.S. Environmental Protection Agency (U.S. EPA). 2018. *Responsible Appliance Disposal (RAD) Program: Guidance for Existing and Prospective Partners*. August 2018. Available: <https://www.epa.gov/sites/production/files/2018-08/documents/rad-guidance-document.pdf>. Accessed: January 2021.
- U.S. Environmental Protection Agency (U.S. EPA). 2019. *Global Non-CO<sub>2</sub> Greenhouse Gas Emissions Projections & Marginal Abatement Cost Analysis: Methodology Documentation*. September 2019. Available: [https://www.epa.gov/sites/production/files/2019-09/documents/nonco2\\_methodology\\_report.pdf](https://www.epa.gov/sites/production/files/2019-09/documents/nonco2_methodology_report.pdf). Accessed: January 2021.