

# R-5. Reduce Service Leak Emissions



## GHG Mitigation Potential



Up to 95.0% reduction in GHG emissions during servicing

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

None

## Climate Resilience

Non-applicable

## Health and Equity Considerations

Non-applicable

## Measure Description

This measure reduces emissions of refrigerants during equipment servicing by employing improved refrigerant servicing technologies and practices. It is estimated that recovering refrigerants can reduce emissions in servicing by up to 95 percent (U.S. EPA 2019). Through implementation of refrigerant recovery, overall service GHG emissions can be reduced. Equipment should only be serviced by qualified technicians certified under Section 608 of the Clean Air Act and who also hold an active California contractor’s license in accordance with California’s Refrigerant Management Program (CARB 2020). Under CARB regulations, technicians must make a recovery attempt using refrigerant recovery or recycling equipment for that type of appliance and refrigerant type before opening the appliance to atmospheric conditions. Implementing more widespread and thorough refrigerant recovery practices while servicing refrigeration and A/C systems would go beyond regulatory requirements.

## Scale of Application

Project/Site

## Implementation Requirements

Require that all appliances are serviced by a qualified technician who must make a recovery attempt using refrigerant recovery or recycling equipment for each appliance and refrigerant type before opening the appliance to atmospheric conditions, in accordance with existing state and federal regulations.

## Cost Considerations

Costs associated with reducing service leak emissions may include installation of leak detection systems and increased staff time to monitor and maintain the system. The benefit of reducing leak emissions depends on the price of the refrigerant and the quantity of leaked refrigerant. Because many refrigerants carry a high cost, detecting and repairing leaks is expected to provide a net cost savings and will also allow for quick and accurate servicing.

## Expanded Mitigation Options

Non-applicable.





## 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 service emissions	0–95.0	%	calculated
<b>User Inputs</b>				
	None			
<b>Constants, Assumptions, and Available Defaults</b>				
B	Equipment service leak rate with measure	2	%	U.S. EPA 2020
C	Equipment service leak rate without measure	Tables R-1.2 through R-1.5	%	U.S. EPA 2016

Further explanation of key variables:

- (B) – The updated service leak rate of the equipment after improved technology and/or practices. Leak rates vary between equipment types. A service leak rate of 2 percent can be assumed in the event project-specific information is not available (U.S. EPA 2020). The user should replace this default in the GHG reduction formula if the user is able to provide a project-specific equipment leak rate.
- (C) – The service leak rate of the equipment.

## GHG Calculation Caps or Maximums

This measure has a maximum GHG emissions reduction of 95.0 percent.

## Example GHG Reduction Quantification

The user reduces service emissions by increasing refrigerant recovery during servicing. In this example, the user operates a commercial A/C and heat pump at a restaurant. The current service leak rate is 4 percent (C). The improved servicing leak rate of the equipment (B) is 2 percent, reducing GHG emissions by 50 percent.

$$A = \frac{2\% - 4\%}{4\%} = -50\%$$

## Quantified Co-Benefits

None.



## Sources

- California Air Resource Board (CARB). 2020. *Refrigerant Management Program: Service Technicians & Contractors*. Available: <https://ww2.arb.ca.gov/our-work/programs/refrigerant-management-program/rmp-service-technicians-contractors>. Accessed: January 2021.
- U.S. Environmental Protection Agency (U.S. EPA). 2016. *Accounting Tool to Support Federal Reporting of Hydrofluorocarbon Emissions: Supporting Documentation*. October 2016. Available: [https://www.epa.gov/sites/production/files/2015-09/documents/hfc\\_emissions\\_accounting\\_tool\\_supporting\\_documentation.pdf](https://www.epa.gov/sites/production/files/2015-09/documents/hfc_emissions_accounting_tool_supporting_documentation.pdf). Accessed: May 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.
- U.S. Environmental Protection Agency (U.S. EPA). 2020. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2018. Stationary Refrigeration Leak Repair Requirements*. Available: <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2018>. Accessed: January 2021.