



Photo by Michael Deru, NREL

HVAC End-of-Life: Options and Best Practices

When heating, ventilating, and air-conditioning (HVAC) systems reach end-of-life status, building owners typically seek the quickest, most cost-effective replacement. Although there are several rooftop unit (RTU) [replacement tool kits and programs](#) to guide clients through this process, there is limited information on how to handle end-of-life HVAC systems.

This fact sheet provides relevant information to help building owners manage proper disposal of HVAC systems, how to navigate regulations, and how to recover economic value from old systems.

What components and materials are inside of a typical packaged HVAC unit (RTU)?

A typical 10-refrigeration-ton RTU weighs 1,100–1,500 lbs and contains multiple compressors, motors, fans, coils, wiring, circuit boards, insulation, plastics, metals, refrigerants, and oil. An approximate breakdown of the materials by weight is shown in **Table 1**.

Material/Component	Percent of Total	Weight (lb)
Oil	0.1%	1.2
Wire	1%	12
Refrigerant	2%	24
Motors	7%	84
Compressors	12%	144
Nonferrous metals	12%	144
Ferrous metals	40%	480
Nonrecyclable	25%	300

Table 1. Materials inside a typical 10-ton RTU. Note: Motors and compressors are primarily metals but are not included in the metal categories.

What should be done with expired equipment?

When not managed properly, expired HVAC assets can be one of the most environmentally damaging waste streams. In addition, there can be a sizable economic cost for removal and disposal of old equipment. To address these concerns, it is recommended that building owners implement a program to monitor and manage expired HVAC assets. The primary focus should be refrigerants, as they are regulated to control for toxicity and environmental impacts.

Spotlight: Lowe's HVAC End-of-Life Program

Lowe's implemented a comprehensive HVAC end-of-life program and recycled and recovered more than **4 million lbs** of material in 2017.

Recycled Materials (lb.)

Oil	4,919
Wire	46,565
Refrigerant	63,132
Motors	287,694
Compressors	559,078
Metals	3,156,331



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Are there specific requirements for proper disposal?

There are no firm regulations or requirements for most of the materials that make up an RTU. The refrigerant is the only material required to have a documented recovery and disposal process. The U.S. Environmental Protection Agency (EPA) issues regulations under Sections 605, 608, and 612 of the Clean Air Act. Section 608 of the Clean Air Act prohibits the known release of refrigerants during maintenance, service, repair, or disposal of air-conditioning and refrigeration equipment. The main requirement that owners need to be aware of is that appliances with 5 lbs or more of chlorofluorocarbon (CFC), hydrochlorofluorocarbon (HCFC), or hydrofluorocarbon (HFC) refrigerants must be recovered and documented by a certified technician.

- [Section 605](#) covers phase out of class II ozone-depleting substances, which are all HCFC refrigerants (e.g., R-22)
- [Section 608](#) covers handling and recycling of refrigerants used in stationary refrigeration and air conditioning
- [Section 612](#) provides acceptable alternatives for refrigerants under the Significant New Alternatives Policy (SNAP).

Typically, HVAC contractors responsible for disposal have sole discretion over what to do with the RTUs. Often, they provide little to no documentation and may dump RTUs in salvage yards. However, starting in 2018, EPA regulations require that records must be maintained for disposal of appliances with more than 5 lbs of HFC refrigerant, which applies to most RTUs above 2 tons. Building owners should request this

documentation of proper handling of the refrigerants and on the disposal of the remaining materials from the HVAC service contractor. Some HVAC service companies offer this as an option, or it can be coordinated through a third party. Additionally, some recycling companies will recover components that have been recently replaced and are in good condition for later use. Depending on the geographical distribution and the number of retired HVAC units, there may be a positive cash flow from recycling, component reuse, and refrigerant recycling.

What should be done with the remaining materials and components such as compressors, motors, and circuit boards? Is it possible to recover some costs?

Components that have been replaced recently or have value can be recovered for future use. The components that are beyond their useful lives provide the highest value as recyclable material.



Additional Resources

Visit the following links for more information on [high-efficiency RTU management](#) and [refrigerant recovery and recycling](#).