



# Twin Cities Metro Area Solid Waste Management Plan Public Comments

July 18, 2023

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## Greenhouse Gas Emissions

Grants focusing on recycling and diminishing greenhouse gas (GHG) emissions are crucial in fostering and inspiring sustainability while tackling environmental issues. These grants centered on recycling aim to endorse endeavors and undertakings that enable the prudent utilization of resources, minimize waste, and mitigate the impact of climate change.

When old appliances are shredded in an auto shredder, the foam insulation within these appliances can release GHG emissions. Below is a brief explanation of the process of the release of these emissions:

1. **Foam Insulation:** Many older appliances, such as refrigerators, freezers, or air conditioners, contain foam insulation to improve energy efficiency. This foam insulation often consists of polyurethane foam containing harmful substances like chlorofluorocarbons (CFCs) or hydrochlorofluorocarbons (HCFCs).
2. **Auto Shredder Process:** Auto shredders are large machines designed to break down and shred various materials, including appliances. When an appliance is fed into an auto shredder, it goes through a mechanical process that tears it apart, separating components like metal, plastic, and foam.
3. **Foam Insulation and GHG Emissions:** The appliance foam insulation can be fractured or damaged during shredding. This can lead to the release of the trapped CFCs or HCFCs, which are potent GHG known to contribute to climate change.
4. **GHG Release:** These gases can escape into the atmosphere and contribute to the greenhouse effect. GHG trap heat within the Earth's atmosphere, leading to global warming and climate change.
5. **Amplified Impact:** As is often the case in recycling operations, shredding appliances in large quantities can significantly release GHG emissions. The cumulative impact of these emissions from appliances being shredded can be substantial and have a negative environmental impact.

To mitigate these emissions and their environmental consequences, it is essential to prioritize recycling methods that effectively handle and dispose of foam insulation containing harmful substances like CFCs or HCFCs. Recycling at the U.S. Environmental Protection Agency's (EPA's) Responsible Appliance Disposal (RAD) program level ensures proper management of these substances and helps minimize GHG emissions associated with foam insulation in old appliances.

### **GHG Emissions and Appliance Recycling**

The amount of GHG emissions avoided by recycling one refrigerator can vary depending on factors such as the size and efficiency of the refrigerator, the specific recycling process employed, and the region in which the recycling takes place. However, below are some general estimates to give you an idea of the potential impact:

1. **Ozone-Depleting Substances (ODS):** Older refrigerators may contain ozone-depleting substances, such as CFCs or HCFCs, in their foam insulation or refrigerant systems. Properly recycling these refrigerators ensures the safe recovery and destruction of these harmful substances, preventing their release into the atmosphere and protecting the ozone layer.
2. **Energy Efficiency:** Refrigerators are energy-intensive appliances. When an old refrigerator is recycled and replaced with a more energy-efficient model, the overall energy consumption and associated GHG emissions can be reduced. Newer models often incorporate advanced technologies and improved insulation, reducing electricity usage.

While specific figures can vary, studies have estimated the following approximate GHG emission savings associated with recycling one refrigerator:

- According to the U.S. Environmental Protection Agency (EPA), recycling one refrigerator can save, on average, 9,000 pounds of carbon dioxide equivalent (CO<sub>2</sub>e) emissions. This estimation includes direct and indirect emissions from the refrigerant from the electricity consumption over the appliance's lifetime.
- The EPA also states that recycling a typical refrigerator can prevent the release of approximately 1,060 pounds of CO<sub>2</sub>e emissions, equivalent to the emissions from driving an average car for about 1,155 miles.

It merits noting that these estimates are general and vary dependent on the specific circumstances and assumptions used in calculations. Nevertheless, recycling refrigerators offers significant environmental benefits by avoiding the emissions associated with disposal and encouraging using more energy-efficient appliances, so setting aside funds for grants for appliance recycling is essential.

### **Grants for Appliance Recycling & GHG Emissions Avoidance**

Grants focusing on recycling and reducing GHG emissions are critical in promoting and encouraging sustainability and addressing environmental challenges. These recycling

grants aim to support projects and initiatives that contribute to the efficient use of resources, waste reduction, and climate change mitigation. Recycling grants fund organizations and communities implementing recycling programs or developing innovative solutions to improve recycling infrastructure. These grants may support the establishment of recycling centers, the purchase of recycling equipment, and the implementation of educational campaigns to raise awareness about the importance of recycling. By supporting recycling initiatives, these grants help divert waste from landfills, conserve valuable resources, and reduce the need for energy-intensive production processes.

Grants targeting GHG emissions reduction support projects that mitigate climate change and promote sustainable practices. These grants can fund initiatives such as adopting renewable energy sources, energy efficiency upgrades in buildings and industries, and developing low-carbon transportation solutions. By providing financial support, these grants encourage the transition to cleaner and more sustainable technologies, helping to decrease the emission of GHG and combat climate change.

Overall, grants focusing on recycling and reducing GHG emissions are vital in driving environmental progress. They enable organizations, communities, and individuals to implement sustainable practices, promote circular economies, and contribute to global efforts to achieve a more sustainable and low-carbon future.

### **Appliance Recycling Programs that Go Above and Beyond**

Appliance recycling programs that go above and beyond what local, state, and federal law requires are instrumental in promoting sustainable waste management practices and maximizing the environmental benefits of appliance recycling. These programs often incorporate innovative approaches, advanced technologies, and comprehensive strategies to guarantee the responsible disposal and recycling of appliances. Beyond legal requirements, these programs may offer incentives and convenience to encourage participation. They may provide pick-up services or drop-off locations that make it easy for individuals and businesses to recycle their appliances. By removing barriers and making the recycling process accessible, these programs increase participation rates and divert many appliances from ending up in landfills.

Furthermore, these programs often prioritize correctly handling and managing hazardous materials found in appliances. Appliance recyclers may partner with specialized recycling facilities with the expertise to safely extract and dispose of hazardous components such as refrigerants, mercury, and lead. These programs protect the environment and public health by ensuring the responsible management of these materials. Appliance recycling programs that surpass legal requirements also emphasize resource recovery. These programs prioritize the extraction and reuse of valuable materials present in appliances, such as metals, plastics, glass, oil, and other valuable resources that can be repurposed. By implementing efficient and effective recycling processes, these programs contribute

to the conservation of natural resources and reduce the need for new raw materials to be extracted, resulting in a more sustainable and circular economy.

In conclusion, appliance recycling programs that go above and beyond legal obligations are crucial for achieving comprehensive waste management and environmental stewardship. By offering incentives, prioritizing hazardous material management, and emphasizing resource recovery, these programs maximize the environmental benefits of recycling while encouraging widespread participation. They play a pivotal role in promoting sustainability, reducing waste, and creating a more circular approach to appliance disposal.

### Recycling of Hazardous Materials

Hazardous materials pose significant risks to both the environment and public health. Many major appliances, such as refrigerators, air conditioners, and televisions, contain hazardous components such as mercury, lead, and ozone-depleting substances. Improper disposal of these types of appliances can lead to releasing these hazardous materials into the environment, causing contamination of soil, water sources, and the air we breathe. Properly recycling significant appliances is not only beneficial for the environment but also for public health. Recycling facilities specializing in waste disposal have the expertise to safely handle and dispose of hazardous materials in appliances. These facilities employ techniques that extract and manage harmful substances, preventing their release into the environment. By recycling significant appliances, ARCA ensures that hazardous materials are handled responsibly, minimizing the risk of exposure to harmful substances for workers and the public.

Furthermore, recycling major appliances helps conserve valuable resources. These appliances often contain valuable metals like copper, aluminum, and steel, which can be recovered and reused. Recycling appliances reduces the demand for extracting and mining new resources, which has negative environmental impacts. Recovering and reusing these materials found in appliances minimizes the need for energy-intensive extraction processes, saving energy and reducing GHG emissions.

In conclusion, properly recycling major appliances is essential for safeguarding the environment and public health. It prevents the release of hazardous materials, mitigates pollution, and conserves valuable resources. By supporting and participating in appliance recycling programs, we as a community can contribute to a cleaner, healthier future while promoting sustainable resource management practices.