



Rapid Response

Pacific Northwest Pollution Prevention Resource Center

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Rapid Response Research Service

Are there local government (county or municipality) waste management programs, projects, or efforts that might also result in a reduction of greenhouse gas emissions?

Requestor: Local Hazardous Waste Management Program in King County

Date: November 2011

Key Findings:

This question was posed from the perspective of local government hazardous waste programs for households or small businesses. The research led to awareness of potential opportunities in other related local government programs and commercial recycling services. . Through discussions, sharing of ideas, and online research, the following waste materials were identified as possible materials or activities that could impact greenhouse gas (GHG) emissions if not managed properly.

- Foams blown with chlorofluorocarbons (CFCs), potent GHGs, or with carbon dioxide (CO₂), could possibly be released during automotive recycling (from seat cushions), from furniture and mattress foams, from insulation in appliances, building insulation, recreational goods, piping insulation, and other products.
- Refrigerants from appliance recycling (notably refrigerators and air conditioners), that still contain historical CFC or currently approved hydrochlorofluorocarbons (HCFC) refrigerants,
- Older, and/or energy-inefficient appliances.
- Food waste and recyclables.

Programs or activities that county or municipal government could consider to address certain wastes and also reduce greenhouse gas releases are listed below:

- Provide education and assistance for auto recyclers. Auto recyclers must comply with [Section 609 Refrigerant Recycling Rule](#) refrigerant recovery laws and prohibit venting during refrigerant recovery and disposal from motor vehicle air conditioners (MVAC).
- Provide education and assistance for appliance recyclers. Appliance recyclers must meet [Section 608 Refrigerant Recycling Rule](#) of the Clean Air Act, and prohibit venting during refrigerant recovery and disposal from refrigerators, freezers, air conditioners, etc.
- Ensure recyclers involved in the final disposal of appliances are certified (with their EPA Regional Office) and they have obtained and are properly using EPA certified refrigerant recovery equipment.
- Participate in and utilize assistance from the U.S. EPA's [Responsible Appliance Disposal Program](#).



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- Research whether GHG releases are a concern from foam recycling activities (from furniture, mattresses, autos, insulation in appliances, etc.), and if so, assist foam recyclers in ways to minimize releases.
- Encourage early retirement, and proper recycling (including refrigerant recovery) of older, energy-inefficient appliances that could be replaced with much higher-efficiency units. In addition, discourage donations of older equipment, and elimination of secondary refrigerator or freezer units within households. Energy-efficiency messaging can be leveraged with local utility involvement.
- Encourage organizational and community/citizen purchasing of non-HCFC blown foam-type products.
- Encourage organizational and community/citizen maximization of composting and recycling, to reduce landfill methane generation and/or reduce the amount of energy required to manufacture new products.

Additional Examples, Information and Resources

HCFC and CFC-Blown Foams:

Chlorofluorocarbons (CFCs) and HCFCs have high global warming potential, meaning they are hundreds to thousands of times stronger GHG emitters, per unit of mass, than carbon dioxide.

Traditionally, the most commonly used foam blowing agents were non-flammable, non-toxic CFC's, such as the well known refrigerants CFC-11 and CFC-12, which are considered "first generation" blowing agents. CFC use was banned in the U.S. because of their ozone depleting potential. No studies were identified that determined the rate of dissipation of CFCs from foam products.

Since the early 1990's, these were mostly replaced by substances with less ozone depleting potential, the HCFCs, including HCFC-141b and HCFC-22. Then in early 2005, the U.S. Environmental Protection Administration (EPA) issued a ban on HCFC-141b as a blowing agent, regulating both the use and import of foam systems containing HCFC-141b. A complete phase-out of HCFCs, regulated by the EPA (and as a party to the Montreal Protocol) is set for 2030, with scaled back phase-out which started in 2010. While CO₂ and other chemicals have or are replacing some HCFC blowing agents, there are still millions and millions of legacy foam goods in use that were blown with CFCs or HCFCs.

Refrigerants.

Autos and old appliances contain refrigerants, and that is one of the reasons it is very important to offer refrigerator and appliance recycling services, to ensure these items are properly recycled, and fluids, toxic materials, and other items are managed and properly disposed of. The [Responsible Appliance Disposal Program](#) of the EPA has successfully reduced greenhouse gas emissions (and ozone depleting substance releases). Their accomplishments and reported avoidance of GHG emissions by participating partners and affiliates, by recovery of refrigerant and foam-blowing agent from appliances is 1.41 MMTCO_{2e} for 2010.

What happens to CFCs removed from end-of-life appliances and autos?



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Older cars and some older equipment still need CFCs for maintenance and since it is no longer produced-the only source for this market is reclaimed CFC.

[EPA safe disposal practices](#) require that the collected CFC and HCFC refrigerant must be reclaimed per EPA regulations ([Section 608 Refrigerant Recycling Rule](#)), and only by [EPA certified reclaimers](#). One exception for direct re-use of refrigerant is if it was removed from a MVAC, and will ONLY be used in another MVAC (See <http://www.epa.gov/ozone/downloads/SafeDisposalBrochure.pdf>).

Additionally, voluntary carbon markets buy it and destroy it to gain carbon offsets; this is a growing practice because of the large GHG impact. A description of how this works can be found from [Blue Source](#).

Retiring Inefficient and Secondary/Multiple Appliances

While counties or municipalities typically encourage recycling, they should consider an exception for old appliances. Currently, many utilities and others distribute a message akin to, "Retire old appliances and replace with energy-efficient models." This practice saves energy (and greenhouse gas emissions). For instance, The Edison Institute for Electric Efficiency – at "[Jump-Starting your EE Portfolio](#)" recommends early retirement of inefficient appliances, and elimination of secondary refrigerators and freezers. The Los Angeles Department of Water and Power offers a [Low Income Refrigerator Exchange Program](#) to certain customers encouraging them to replace their old, inefficient refrigerators with a new energy saving model.

The [Responsible Appliance Disposal Program](#) also promotes early appliance retirement, and their partners report a reduced energy consumption of 2.17 MMTCO₂e in 2010, from these efforts.

Compost and Recycling

In landfills, compostable materials undergo anaerobic decomposition and produce significant quantities of methane, up to 80% of which is not captured by a landfill gas system. Composting, on the other hand, is a fundamentally aerobic process, and well managed, aerobic compost facilities produce little, if any methane.

Recycling avoids greenhouse gas emissions from many life cycle aspects, from extraction (which is avoided through recycling), through manufacturing. For more information on these topics, see EPA's May 2011 report., "[Reducing Greenhouse Gas Emissions Through Recycling and Composting](#)".

The EPA also has a [Waste Reduction Model \(WARM\)](#) calculator, developed to assist solid waste managers in determining the GHG impacts of their waste management practices. WARM compares GHG and energy impacts of landfilling, recycling, incineration, composting, and source reduction.

Conclusion

Certain local government waste management activities contribute to greenhouse gas emissions, which may be minimized with government oversight, management, and messaging to business and citizens. The message of greenhouse gas emission reductions or avoidance, along with the other environmental impacts of these



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wastes, may provide additional incentive or encouragement to ensure goods and wastes are properly disposed of.