



**Melissa Fiffer**

**U.S. Environmental Protection Agency  
ENERGY STAR Partner Products Meeting  
November 9, 2011**

# Scope of Briefing

Why is EPA Emphasizing Responsible Appliance Disposal through RAD?

Environmental Benefits!

- Why Reach out to ENERGY STAR Partners?
  - Similar Goals: Get New ENERGY STAR Appliance into homes and Old Units Disposed of through RAD
  - Climate Benefits a Key Goal, and For Older Appliances, a Time-Limited One

# Responsible Appliance Disposal (RAD) Program

- RAD is EPA's voluntary program that builds on the Safe Disposal regs
- RAD partners ensure disposal of refrigerant-containing appliances using a multi-media approach and the best environmental practices available
- RAD partners include:
  - Utilities
  - Retailers
  - Manufacturers
  - State & Local Governments
  - Universities



# Scope of Problem

- **Currently in the U.S., there are:**
  - 132 million household refrigerators
  - 54 million stand-alone freezers
- **15% - 20% of households have 2<sup>nd</sup> refrigerator/ freezer in basement or garage (~23 million units)**
  - Typically, these are older units that are less energy efficient
- **~ 5% of units are disposed each year (~8 million refrigerators/freezers)**
  - Few are disposed in an environmentally-sound manner
- **A household refrigerator made 20 years ago consumes twice the energy of a unit that has earned the government's ENERGY STAR® label**

# What Happens To Old Appliances?

Old appliances collected by municipalities and retailers may be either...

## – Disposed

- Refrigerant may or may not be recovered and reclaimed/destroyed, as required by law
- Foam is landfilled
- Fate of used oil, PCBs, mercury uncertain
- Metal components scrapped

*OR*

## – Resold

- Old units continue to strain energy demand
- Ultimate disposal uncertain



# Proper Appliance Disposal Gets More for the Environment than Replacement Alone

- **Taking Old Appliances off the Grid:**
  - Reduces energy demand
    - Replacing an older appliance with a new ENERGY STAR® unit can save over 700 kWh/year
  - Saves consumers money
    - Removing an energy-inefficient unit can save over \$140/year
    - Replacing older appliances with new ENERGY STAR® units can save over \$70/year
  - Improves air quality
    - Reduced electricity generation reduces emissions of some criteria air pollutants
- **Proper Disposal:**
  - Prevents Emissions of Ozone Depleting Substances (ODS), Greenhouse Gases (GHGs) & Other Harmful Substances
  - Saves landfill space
  - Saves energy needed to manufacture virgin materials by recycling metals, glass, plastics

# A Refrigerator Manufactured Before 1995 Typically Has...

## Metal, Plastic, and Glass Casing/Refrigerator Shell

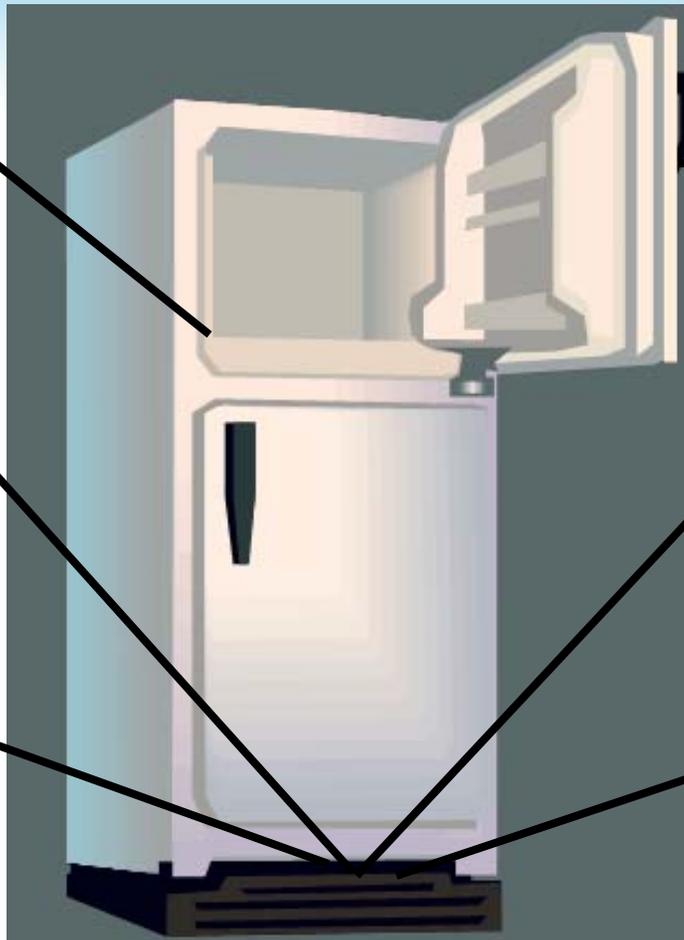
140 lbs metal  
20 lbs plastic  
3 lbs glass

## Used Oil

(May be contaminated)  
0.5 lb

## PCBs

(Capacitor)  
Small quantities



## CFC-11

Foam Insulation  
1.0 lb

## CFC-12

Refrigerant  
0.5 lb

## Mercury Switch

0.003 lb

***Proper recycling/destruction of these substances is key***

# RAD Program Objectives

**Work with utilities, retailers, manufacturers, state & local governments, and universities to:**

- **Prevent ODS emissions**
  - Through recovery & proper disposal of ODS refrigerants & foam blowing agents from disposed appliances
- **Reduce GHG emissions by reducing**
  - energy demand associated with older appliances
  - emissions of refrigerants, foam blowing agents with high global warming potentials
- **Support and recognize partners**
  - Encourage recovery of ODS refrigerant & foam by sharing information about best available technologies & practices
  - Recognize leaders going above and beyond legal requirements

# Environmental Impacts of ODS & ODS Substitutes

Foam Blowing Agent

CFC-11



HCFC-141b

Refrigerant

CFC-12



HFC-134a

Transition in mid-1990s

Chemical	Atm Lifetime	Ozone Depletion Potential	Global Warming Potential
CFC-11	45	1.0	4,750
CFC-12	100	1.0	10,900
HCFC-141b	9.3	0.1	725
HFC-134a	14	0	1,430

Atmospheric lifetime based on IPCC (2007); ODPs based on 40 CFR; GWPs based on IPCC (2007)



# Benefits of Responsible Appliance Disposal

For every 1,000 refrigerators prematurely retired & disposed of under RAD, greenhouse gas emissions are reduced by 8,200 MMTCO<sub>2</sub>e. This is equivalent to:

11.4 million kWh of electricity saved



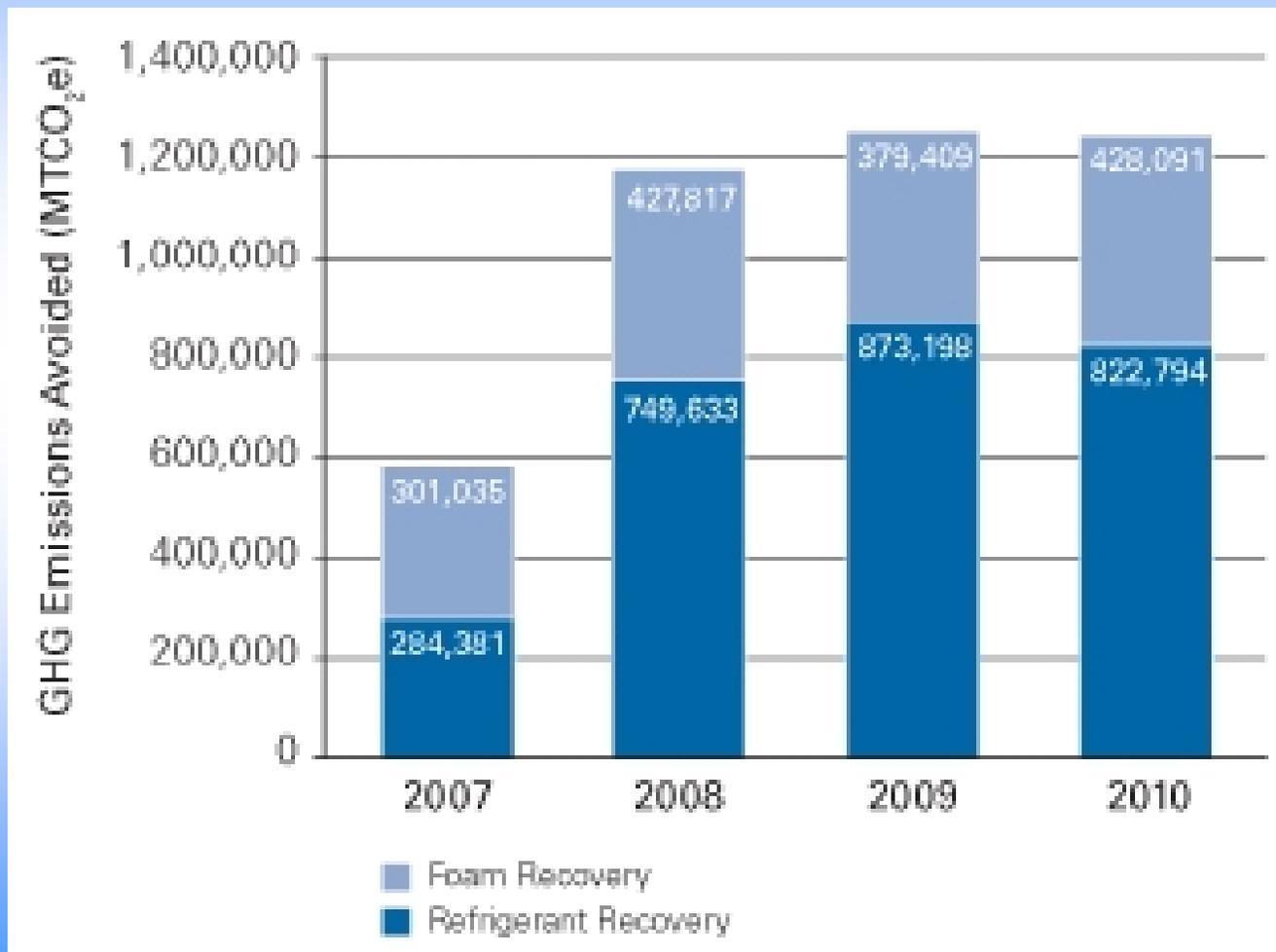
Annual electricity use of over 1,100 homes



# 2010 RAD Program Results

- In 2010 RAD partners processed over 735,000 appliances, preventing:
  - Emissions of over 417,000 pounds of ODS
  - Emissions of 1.41 MMTCO<sub>2</sub>e or annual emissions of over 276,000 cars
  - Over 100 million pounds of metal plastic and glass from going into landfill
  - And the proper handling of used oil, PCBs, and mercury

# GHG Emissions Avoided by RAD Partners 2007-2010





# RAD Program Requirements

RAD partners use best practices to dispose of appliances; they ensure that:

1. Refrigerant is recovered and either reclaimed or destroyed
2. Insulation foam is recovered and destroyed, or the blowing agent is recovered and reclaimed
3. Metals, plastic, and glass are recycled
4. Polychlorinated biphenyls (PCBs), mercury, and used oil are recovered and properly disposed of

Partners report results to EPA on a quarterly basis





# Partner Events

Right: Sears event to announce joining the RAD Program



Above: WV announces joining RAD Partnership

Below left and right: GE event in Philadelphia



# Current RAD Partners

- 1) Southern California Edison
- 2) PG&E, CA
- 3) Snohomish PUD, WA
- 4) Sacramento Municipal Utility District, CA
- 5) Fort Collins Utilities, CO
- 6) PacifiCorp
- 7) Nevada Power & Sierra Pacific Power, NV
- 8) San Diego Gas and Electric, CA
- 9) Austin Energy, TX
- 10) City of Palo Alto Utilities, CA
- 11) City of Richland Energy Services, MA
- 12) PNM, New Mexico
- 13) Burbank Water and Power, CA
- 14) Commonwealth Edison, IL
- 15) SRP, AZ
- 16) Sears Home Services
- 17) Nebraska Public Power District
- 18) Energy Trust of Oregon
- 19) Dayton Power and Light, OH
- 20) American Electric Power (AEP), OH
- 21) WPPI, WI
- 22) Georgia Power, GA
- 23) Baltimore Gas & Electric, MD
- 24) Great River Energy, MN
- 25) Consumers Energy, MI
- 26) Hoosier Energy REC, Inc., IN
- 27) Arizona Public Services, AZ
- 28) West Virginia Department of Environmental Protection
- 29) Vectren Energy Delivery, IN
- 30) Best Buy
- 31) Appliance Smart
- 32) Silicon Valley Power
- 33) Idaho Power
- 34) Puget Sound Energy
- 35) Cape Light Compact
- 36) Avista Utilities
- 37) Lodi Electric Utilities, CA
- 38) Indiana Michigan Power (AEP)
- 39) General Electric
- 40) Northern Indiana Public Service Company
- 41) Riverside Public Utilities, CA
- 42) New York State Energy Research and Development Authority (NYSERDA)
- 43) National Grid
- 44) Home Depot

# Want to be the next RAD partner? Contact Us:

**Melissa Fiffer**

202-343-9464

fiffer.melissa@epa.gov

**Evelyn Swain**

202-343-9956

swain.evelyn@epa.gov

[www.epa.gov/ozone/partnerships/rad/index.htm](http://www.epa.gov/ozone/partnerships/rad/index.htm)

