Age Before Beauty? Stability and Change in Recycling Program Savings Over Time

Appliance recycling programs have long held a place in efficiency portfolios. These programs produce energy savings by using incentives and outreach to encourage participants to retire inefficient secondary appliances. In addition, recycling programs provide a valuable service by facilitating the pickup of bulky appliances. However, as efficiency standards have increased, program administrators, regulators, and evaluators have raised concerns about the energy savings being realized by the current vintages of recycled appliances. They also have questions about what participants realistically would have done with the appliances in the absence of the program. In short, do the current savings continue to justify a place for appliance recycling programs in program portfolios?

In this poster, the authors explore the stability and change in factors that affect energy savings resulting from an appliance recycling program over time. In addition, we provide details on customer satisfaction and experience, including how customer experience varies based on key demographic factors.

Following an approach advocated by the Uniform Methods Project (UMP), the authors used a combination of program tracking data, responses from an online survey of 365 appliance recycling participants, and the Residential Energy Consumption Surveys (RECS) to update gross and net energy savings. Updated parameters include appliance age and date of manufacture, size, door configuration, location in unconditioned space, partial use, and free-ridership. The poster compares the current parameter values and savings to those obtained in a 2011 study of the same program and to other recent appliance recycling program evaluations. The poster discusses factors that have affected refrigerator and freezer savings over time.

The poster also explores issues related to the physical and financial feasibility of program alternatives, program satisfaction, and demographic differences in the participant experience.

LISA WILSON-WRIGHT | SHIRLEY PON |ALYSSA NA'IM | KATHERINE WEBER
NMR GROUP, INC.

Shirley Pon | Quantitative Analyst
617-284-6230 ext.47
spon@nmrgroupinc.com
www.nmrgroupinc.com

AGE BEFORE BEAUTY?

STABILITY AND CHANGE IN RECYCLING PROGRAM SAVINGS OVER TIME

LISA **WILSON-WRIGHT** | SHIRLEY **PON** | ALYSSA **NA'IM** | KATHERINE **WEBER** | NMR GROUP, INC.

BACKGROUND

The Massachusetts Program Administrators (PAs) currently sponsor a refrigerator and freezer recycling program through the Residential Consumer Products Core Initiative.

$50 rebate + removal
*size of rebate subject to program changes

In 2017, the program provided
- 15,637 rebates for recycled refrigerator rebates
- 2,663 rebates for recycled freezers

APPROACH

UNIFORM METHODS PROJECT

Approach advocated in the Uniform Methods Project (UMP) to guide the estimation of gross and net energy savings. The UMP approach accounts for
- free-ridership
- transferred use
- non-free-ridership

ANALYSIS

Updated gross and net savings using the following data sources
- program tracking data
- 365 online appliance recycling survey responses
- Residential Energy Consumption Surveys

PROGRAM SAVINGS

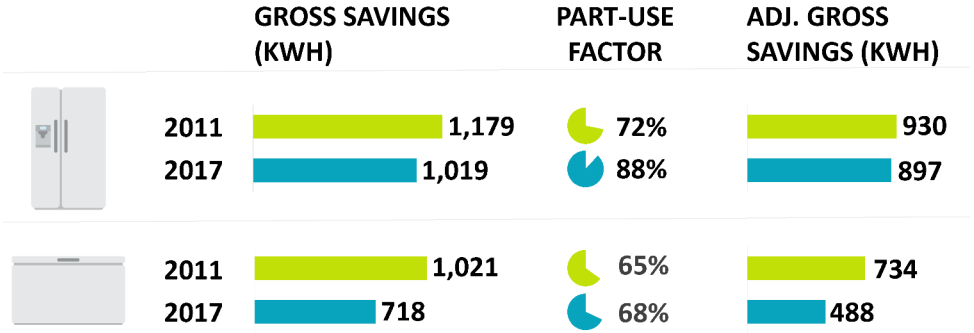
A follow-up 2018 study found savings in a similar range (not shown).

2017 PROGRAM SAVINGS (kWh)		
Gross savings	1,019	718
Part-use factor	88%	68%
Adjusted gross savings	897	488
Net-to-gross ratio	44%	56%
Net savings	398	275

COMPARISON OF APPLIANCE RECYCLING SAVINGS 2011 - 2017

REFRIGERATOR SAVINGS
- Gross energy savings for refrigerators fell by 14%
- Participants recycled younger and more efficient units
- Unit size and the side-by-side door configuration also increased over the years

FREEZER SAVINGS
- Gross energy savings for freezers decreased by 30%
- Efficiency gains stemming from the younger age and smaller size of freezers recycled



PRIOR ACTION

REFRIGERATORS **24%** | FREEZERS **28%**

of respondents tried to get rid of their appliance prior to program participation.

Actions taken prior to program participation include (percent of total respondents; multiple responses allowed):

	R	F
Give it away for free	6%	11%
Sell it	1%	9%
Take it to a garbage dump or put out as trash	1%	2%
Have a retail store come and pick it up	5%	1%
Recycle it	3%	1%
Hire a hauler to take it away	2%	1%
Don't know	8%	9%
# of respondents	176	93

PAYING FOR REMOVAL

HOW MUCH WOULD YOU HAVE BEEN WILLING TO PAY FOR REMOVAL?

- Half of participants were willing to pay fees similar to those charged by municipal recycling programs, but below those charged by hauling companies

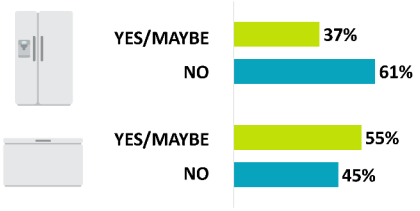
$25 - $100

- Younger respondents more frequently said that they were *unwilling to pay any amount* for someone to remove the unit

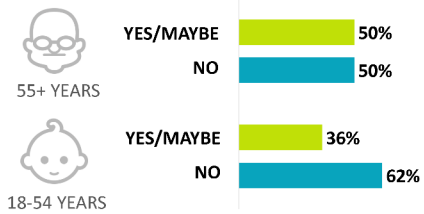
DETAILED FINDINGS

WOULD THE PHYSICAL SIZE OF THE APPLIANCE HINDER REMOVAL?

DIFFERENCES BY APPLIANCE
- More respondents felt the bulk size of freezers would have hindered removal



DIFFERENCES BY AGE
- Over 50% of respondents for both appliances said they were 55 years or older
- Participants aged 55 or older voiced greater concerns about the physical hindrances of removal



FREE-RIDERSHIP IMPACT

Older respondents were more likely to
- Say they required assistance to remove their appliances
- Recycle units over ten years old; therefore, a greater proportion of older respondents met the criteria for free-ridership

The net savings algorithm designated the following percentage of free riders by age: