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Southern California Edison Safeguarding the Environment One Appliance at a Time

Energy conservation is becoming one of the nation's top priorities, as concerns over climate change, national security, and energy costs have deepened. Recognizing this, the California Public Utilities Commission (CPUC) is sponsoring programs funded with ratepayer dollars to reduce statewide energy consumption. With these funds, Southern California Edison (SCE) and other California utilities are implementing appliance recycling programs (ARP), designed to reduce energy consumption and benefit both consumers and the utility company. Specifically, these programs encourage retirement of inefficient appliances to reduce energy demand, thereby eliminating the need for utilities to build new power plants and, at the same time, lowering customers' electricity bills.

Large appliance replacement and retirement programs – focused primarily on refrigerators and freezers – are often targeted by utilities and state agencies as one of the first elements of a Demand Side Management (DSM) program since they are substantial users of electricity. These appliances are bulky and have a long shelf life, so they are often slow to replace. To decrease demand on the energy grid and ensure responsible appliance disposal, SCE provides customers with monetary incentives to pick-up and dispose of their old working refrigerators and freezers using best environmental practices.

To gain recognition and track environmental benefits beyond energy savings, SCE partners with the Environmental Protection Agency (EPA) as part of the Responsible Appliance Disposal (RAD) program. "SCE has enjoyed a strong relationship with EPA over the years, and participation in RAD is a continuation of that," offered Tom Schober, SCE ARP Program Manager. "The RAD Program provides us with an opportunity to partner with the EPA in an effort we both believe in."

Description of SCE's Appliance Recycling Program: Using Tactics of Social Marketing and Education

SCE, which serves a region with 13 million residents, started its appliance disposal program in 1994, and has recycled more than 600,000 appliances to date. During PY 2006-2008, 245,000 refrigerators/freezers and 12,000 air-conditioning (AC) units are planned for removal. During this program year, the ARP is being expanded to non-residential customers, including office complexes, industrial customers, schools, etc. Collected appliances are being processed by Appliance Recycling Centers of America, Inc. (ARCA) and JACO Environmental, Inc.

SCE's ARP utilizes social marketing tools—such as financial incentives, appliance pick up events, and educational information—to change consumer behavior and encourage energy conservation. "By reaching out to households throughout our service area about the importance of energy conservation, the appliance recycling program educates consumers and allows them to contribute in a meaningful way," says Schober.

SCE offers their customers free appliance pick-up and a \$35 incentive for disposing of an old working refrigerator and \$50 for disposing of an old working freezer. The only requirement is that collected refrigerators and freezers be in working condition and that their size be between 10 and 27 cubic feet.

SCE also leverages energy efficiency partnerships to increase outreach and project penetration. Events such as "Refrigerator and Freezer Pick-Up Day" are held in concert with other energy efficiency programs. During these events, working refrigerators and freezers in a particular geographic area are picked up on Saturdays, which increases the convenience of pick-up for customers. SCE works with retailers to provide consumers with POS (Point of Sale) materials to inform them of events and provides them with information on ARP. SCE has also partnered with property management companies to encourage the replacement and proper disposal of old appliances.

In addition, SCE collects and recycles room AC units as part of ARP. Specifically, SCE holds AC Turn In events to encourage customers to retire their old room ACs. Customers bring their working room AC units to the event and receive \$25 credit for their old units, as well as a \$50 voucher towards the purchase of a new ENERGY STAR[®] room AC unit—for a total incentive of \$75 off the purchase of a new ENERGY STAR[®] room AC unit.

ARP marketing activities include bill inserts and messages, the SCE website, special mailings, e-mail blasts and occasional radio commercials. SCE has also targeted the environmental community and has used recycling trucks as mobile billboards. "These marketing techniques are not only effective in increasing program participation and decreasing energy consumption," says Schober, "but they also give SCE visibility, so that consumers can see our commitment to the environment put to action."



Environmental Benefits of the Program

According to Schober, "SCE recognizes that ARP not only saves energy but also helps protect the environment." EPA has recognized SCE's contribution to the environment by awarding ARP with the Stratospheric Ozone Protection Award in 2004.

Based on SCE's own calculations, removing old appliances from the electric grid during PY 2006-2008 will result in net annual energy savings of nearly 180 million kWh (assumed to be realized each year for 10 years), and coincident peak reductions of over 30,824 kW. Such energy savings will lead to reduced emissions of greenhouse gases (GHGs) and smog precursors emitted by power plants. Indeed, removing 245,000 old refrigerators/freezers from the grid is expected to result in the following lifetime emission reductions:

- NO_x emissions: ~ 260,000 lbs
- GHG emissions: ~ 985,000 MTCO₂eq
- PM₁₀ emissions: ~ 127,000 lbs

These GHG emission savings are equivalent to not driving **213,243 passenger cars** for one year, or removing **126,467 households** from the electricity grid for one year



SCE and ARCA are awarded a 2004 Stratospheric Ozone Protection Award for their leadership, dedication, and technical achievements in protecting the ozone layer through appliance recycling. From left to right: Bruce Wall (ARCA), Drusilla Hufford (EPA), Gene Rodrigues (SCE), and Jack Cameron (ARCA).

In addition to the above benefits, additional climate and ozone benefits are realized through the proper disposal of refrigerated appliances. Under SCE's program, ozone-depleting refrigerants and foam blowing agents—which are also potent greenhouse gases—are recovered from appliances and reclaimed or destroyed. Raw material components, including metal, glass, and plastic, are also recycled, which reduces energy consumption associated with the production of virgin materials. During PY 2006-2008, reclaiming the refrigerant, reclaiming or incinerating the foam, and recycling the raw material components of refrigerators/freezers is estimated to result in a climate benefit of 1,015,000 MtCO₂eq, and an ozone benefit of 136 ODP-weighted tons.

Program Effectiveness

Energy Impacts & Effectiveness at a Glance, PY 2006-08 ^a	
Annual Net Energy Savings	177,322,800 kWh
Average Energy Savings/ Unit/Year	722 kWh
Coincident Peak Reduction	30,824 kW
Total Program Cost	\$39,893,411
Rebate Cost	\$9,400,000
Average Program Cost Per Unit	
Including Rebate	\$155.23
Not including Rebate	\$118.65
Electric Benefits	\$93,063,110
Benefit-Cost Ratio	
PAC ^b	2.52
TRC ^c	6.07
Levelized Cost	
PAC ^b	\$0.032
TRC ^c	\$0.013
Net-to-Gross Ratio	
Refrigerators	0.35
Freezers	0.54
AC Units	0.80

SCE ranks "cost effective energy savings" as the most significant benefit derived from its ARP. To ensure the program realizes these energy savings, ARP conducts inspector "ride alongs," on-site inspections of recycling facilities and customer surveys, which are part of the program's compliance and verification procedures. Using random statistical sampling, SCE energy efficiency inspectors ride with the contractor pick-up staff to ensure that units collected meet the program requirements and that the units are handled properly. In addition, on-site inspections of recycling facilities are conducted to verify that proper procedures are being followed. Finally, customer surveys are also conducted over the phone to measure satisfaction levels and determine what impact the program has on customer behavior (i.e., what the customer would have done with the unit in the absence of such a program).

The total program cost for PY 2006-2008 is approximately \$39.9 million. SCE has valued the associated electric benefits at over \$93 million. Depending on the program cost measure used (i.e., whether rebate is included or not), the benefit-cost ratio ranges from almost 7:1 to about 3:1; similarly, the levelized cost per kWh saved is about \$0.013 (i.e., it costs SCE about 1.3 cents to reduce each kWh).

"For what it costs to implement and administer this program, we get much more in return from the energy savings that are generated," says Schober. In fact, SCE has found ARP to be one of the most cost effective energy savings programs that is offered through their portfolio of energy efficiency programs. The additional environmental benefit associated with the proper disposal of ozone-depleting refrigerant and foam is the "cherry on top."

Additional Information

For more information on SCE's ARP program, visit www.sce.com or contact Tom Schober at tom.schober@sce.com.

For more information about EPA's RAD Program, visit www.epa.gov/ozone/snap/emissions/radp.html or contact Evelyn Swain at swain.evelyn@epa.gov or 202-343-9956.

^a Per SCE's 2006-08 Final Energy Efficiency Proposed Program Plans.

^b PAC = Program administrator cost test; includes rebate.

^c TRC = Total resource cost test; does not include rebate.