

For more information, contact:

**Energy Efficiency and Renewable Energy Clearinghouse (EREC)**

1-800-DOE-3732  
www.eren.doe.gov

Or visit the BTS Web site at:  
www.eren.doe.gov/buildings

Written and prepared for the U.S. Department of Energy by:

Ms. Sam Nichols  
Energy Services Department  
Hawaiian Electric Company, Inc.  
Energy Services Department  
220 S. King Street  
Suite 1010  
PO Box 2750  
Honolulu, HI 96840  
Phone: 808-543-4753  
Fax: 808.543-4722  
E-mail: snichols@hei.com

*NOTICE: Neither the United States government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States government or any agency thereof.*

Of the 21 sites recommended for lighting retrofits, seven businesses actually installed lighting retrofits and have realized an aggregate of 249,000 kWh per year in energy savings. The businesses saved \$23,000 per year and received an additional \$7,000 in rebates from HECO's energy conservation program.

### THE BOTTOM LINE

HECO, DBEDT, and Rebuild America will continue to reach out to the underserved small business sector. With the Energy Solutions for Small Business Program showing more and more successes, it gives more small business owners the opportunity to realize energy and money savings, and feel good about their contributions to a healthier, safer Hawaii.



### Buildings for the 21st Century

Buildings that are more energy efficient, comfortable, and affordable...that's the goal of DOE's Office of Building Technology, State and Community Programs (BTS). To accelerate the development and wide application of energy-efficiency measures, BTS:

- Conducts R&D on technologies and concepts for energy efficiency, working closely with the building industry and with manufacturers of materials, equipment and appliances
- Promotes energy/money saving opportunities to both builders and buyers of homes and commercial buildings
- Works with State and local regulatory groups to improve building codes, appliance standards and guidelines for efficient energy use
- Provides support and grants to States and communities for deployment of energy-efficient technologies and practices



## HAWAII HAS DISCOVERED ENERGY SOLUTIONS FOR SMALL BUSINESS

The growth in Hawaii's population and new uses for electricity have resulted in a burgeoning demand for power on these post-card-perfect islands. And although utilities are in the business of generating and selling power, energy efficiency and conservation are sound investments on these islands. Scaling back Oahu's growth rate of energy use through energy-efficiency programs helps delay the need for new power plants in the future and defers construction costs in the millions of dollars.

Since 1996, local utilities on the islands of Hawaii have offered demand-side management (DSM) programs to their large commercial customers to reduce energy demand. By offering rebates to utility customers who install energy-efficient devices, Hawaiian Electric Company, Inc. (HECO) on Oahu, Hawaii Electric Light Company, Inc. (HELCO) on the Big Island, and Maui Electric Company, Inc. (MECO) have promoted the upgrade of motors, lighting, water heating systems, and heating, ventilation and air-conditioning (HVAC) systems in both new construction and large businesses.

The results have been decisive, with these larger business and new construction sites saving over \$10 million in energy costs. Despite overwhelming success in these markets, smaller businesses showed little interest in taking advantage of the program or investing in energy-efficient retrofits. Smaller businesses, which are defined as establishments with less than 200 lighting fixtures, account for a large portion of Hawaii's commercial customers. HECO

estimates that its underserved small business customers—including small-to-medium hotels, fast food, convenience stores, small retail, small offices, specialty shops, condominiums, and churches—total more than 24,000. Hawaii could no longer afford to allow these businesses to be eclipsed by their large commercial counterparts in the realm of energy efficiency. Realizing the energy-saving potential, HECO and the Hawaii State Department of Business Economic Development and Tourism (DBEDT)—partners in the U.S. Department of Energy's Rebuild Hawaii Consortium—developed a special program targeted to reach the small business sector.

### IDENTIFYING THE BARRIERS

Before any solutions could be implemented or quads of energy saved in the small business sector, HECO and Rebuild America needed to identify and break down the existing barriers to adoption of energy-efficiency measures. HECO scheduled an interactive planning and "fact-finding" meeting on August 13, 1998, to gather input from a local community business association, Chamber of Commerce representatives, small-business owners, and representatives of DBEDT and HECO.

Small business owners indicated "a lack of time, knowledge, trust in the vendors, capital, and cost-effectiveness" as the primary reasons that retrofits have been slow to catch on. Small business owners perceived energy-efficiency efforts as

absorbing excessive time, necessitating that they haggle with contractors to obtain bids. Some owners felt they were not educated enough to make a fair assessment and comparison of services, while others held a certain amount of distrust toward contractors, doubting that the promises made were accurate. Many owners felt that it would be difficult to finance capital upgrades, which would require a large expense up front—one that might never be recaptured.

According to HECO's Sam Nichols, from the Energy Services Department, "From the lighting contractor's side, the small business market is often expensive to service due to small size and limited opportunities for retrofits. Nevertheless, we felt it was an important market to target to help the small business owners capture the energy savings we knew were out there."

**FORMULATING AN EFFECTIVE SOLUTION**

Rebuild America played a pivotal role in proposing an energy-efficiency solution that would benefit the customer, the energy generator and the vendor. HECO—a Rebuild America Partner—hosted the kick-off meeting for Rebuild America in Hawaii on October 28, 1997, at the Ala Moana Hotel and, thus, was influential in establishing Rebuild America in Hawaii. From this partnership, HECO's Energy Solutions for Small Business project was conceived under a Small Commercial Market Transformation project funded by a competitive Rebuild America grant, with substantial HECO in-kind contributions.

To attract small business participation, HECO tailored Energy Solutions for Small Business to overcome stated barriers and to meet specific small business needs. Energy Solutions for Small Business was developed as a market transformation project that used aggregation of many small customers into one bidding package as the primary solution. Aggregation would save time for the customer and the vendor; remove distrust of vendors on the part of the customer; provide verifiable energy information; and allow for the verification of savings once the retrofit was completed.

The utility took over the role of marketer and coordinator of the retrofit project, which minimized the amount of time required by small business owners. Instead of dealing with several contractors and walking with each of them through the auditing process, business owners were able to save time by dealing solely with the HECO representative. HECO representatives were able to effectively compare and evaluate bids, using their existing knowledge of energy-efficient technologies to consider all benefits gained through retrofits and including the rebates available from HECO, which would help offset costs.

HECO representatives were then able to fill in the blanks for small business owners, explaining technologies, benefits and rebates in easy-to-understand, non-technical terms. As the energy supplier, HECO could supply current and historical information on the operation's energy usage and costs and could offer better ener-

gy and cost savings information than outside sources.

To combat contractor distrust, HECO recommended contractors, made sure that proper permits were issued and insisted that all equipment meet HECO Program standards. HECO also provided a one-year guarantee on all parts and labor over and above the installer's guarantee. Contracts would include disposal of old lamps and ballasts to alleviate customer concerns about improper dumping of hazardous materials such as mercury commonly found in fluorescent lamps. To better assure the retrofit was done correctly, HECO also performed post-installation inspections prior to the contractor being paid.

Hiring individual contractors to perform retrofits was cost-prohibitive for many small businesses. Even with fair pricing, they could not realize the economies of scale available to larger establishments. To alleviate the cost burden for small businesses, HECO issued RFPs to vendors to perform a multitude of retrofits to several aggregated small businesses and provide quantity price breaks. Since HECO was performing the marketing function and identifying customers, lighting contractors were able to remove these costs from the equation and then bundle individual projects, taking advantage of economies of scale and offering attractive retrofit costs with quick payback periods.

Finally, the need to gather upfront capital before beginning retrofits was also a factor in small businesses' reluctance. Lighting retrofits typically cost between \$1,000 and \$5,000 and most lighting contractors (who also tend to be small businesses) could not offer a payment plan. Many owners felt the amount was too small to warrant a bank loan. HECO stepped in and agreed to pay the lighting contractor once the retrofit was inspected and approved. To obtain payment from the small businesses, HECO would divide the expense into four equal amounts and bill the customer over four consecutive months at zero interest. This allowed the small business owner the ability to handle the slight increase in their monthly utility bill while enjoying better quality lighting, lower lighting costs and decreased energy consumption.

**THE PILOT**

The Energy Solutions for Small Business pilot project was charged with developing a replicable model of implementing energy-efficiency retro-

fits that would also increase economic development and be cost competitive. By cost-sharing the project with DBEDT, HECO included the initiative as part of its Rebuild America Action Plan and was able to utilize their grant funds from the Rebuild America program to carry out the project.

Lighting and its associated costs account for significant energy expenditures in buildings. One of the simplest and most cost-effective ways to save money on an electric bill is through energy-efficient lighting. Lighting typically accounts for 15–45 percent of the overall electricity used in Hawaii's commercial buildings. Simple lighting retrofits replacing T12s with magnetic ballasts with high-efficiency T8s with electronic ballasts can reduce lighting consumption by 30 percent. For these reasons, the Energy Solutions for Small Business pilot project emphasized lighting in businesses with less than 200 T12 fixtures at their facilities. Switching out these relatively inefficient lamps and ballasts would not only be a cost-effective measure,

but also a logical first step to incorporate energy efficiency on a "whole building" level.

In addition to the obvious and measurable energy savings through lighting retrofits, small businesses would also benefit from a modernized work environment with brighter lighting, more lumens, more attractive merchandise displays and more comfortable working conditions.

On the accompanying chart are approximate energy savings and payback periods that could be achieved at a small hotel, according to HECO:

HECO conducted its first lighting retrofit pilot project under the Energy Solutions for Small Business Program, auditing 21 sites on Oahu, including restaurants, retail stores, housing facilities, parking garages and a TV station. These initial audits identified \$140,000 in recommended retrofits, which would save 612,000 kWh per year. Completion of these retrofits would yield \$53,000 in annual energy savings and would earn \$18,000 in HECO rebates.

**Lighting Retrofit in Small Hotel**

- **RETROFIT LAMPS:**
  - 125 Fixtures Total*
  - 50 8' 2 lamp*
  - 50 4' 2 lamp*
  - U-bend*
  - 25 2 lamp*
  - On 24 hrs a day*
- **TOTAL ENERGY SAVINGS:**
  - \$35,599 kWh per year*
- **HECO REBATES:**
  - \$780*
- **RETROFIT COST AFTER REBATE:**
  - \$4,600 or \$1,150 for 4 months*
- **ANNUAL SAVINGS & PAYBACK PERIOD:**
  - \$3,596 (avg. \$300/mo)*
  - 1.28 years payback*