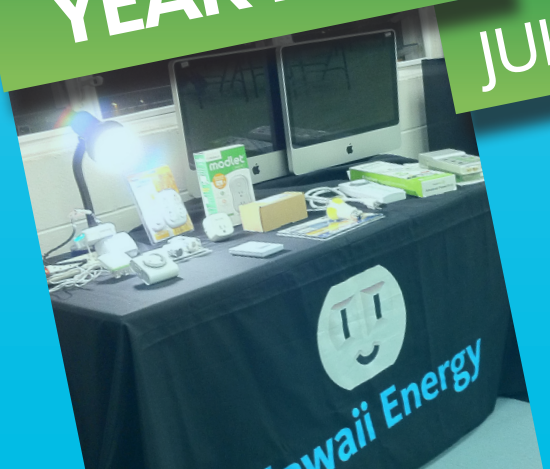
ANNUAL REPORT

PROGRAM YEAR 2014

JULY 1, 2014 - JUNE 30, 2015



Hawaii Energy

YOUR CONSERVATION & EFFICIENCY PROGRAM

leidos

Annual Report

Program Year 2014

July 1, 2014 – June 30, 2015

Submitted to the Hawaii Public Utilities Commission on
December 11, 2015 by:

Hawaii Energy (Leidos Engineering, LLC)
Public Benefits Fee Administrator
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Hawaii Energy is the ratepayer-funded energy conservation and efficiency program administered by Leidos Engineering, LLC under contract with the Hawaii Public Utilities Commission serving the islands of Hawaii, Lanai, Maui, Molokai and Oahu.

A full report with attachments is available online at www.hawaiienergy.com/information-reports

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A majority of the tables in this report are sorted in descending order by Lifetime Energy Impact. This figure drives Program cost-effectiveness in terms of Total Resource Benefit (TRB) and Levelized Cost of Saved Energy (CSE).

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A MESSAGE FROM THE PROGRAM DIRECTOR

On behalf of the entire Hawaii Energy Team, we are proud to submit our Program Year 2014 (PY14) Annual Report, covering July 1, 2014 through June 30, 2015 and highlighting our sixth year as Hawaii's Public Benefits Fee Administrator (PBFA).

This has been another successful and progressive year for energy efficiency in Hawaii. As detailed in this Report, Hawaii Energy's efficiency programs for PY14 will deliver 1.5 billion kWh in lifetime energy savings to the electric grid system at a total program cost of 2.4¢ per kWh (total program costs / total system kWh benefit). This, in turn, will save an estimated equivalent of 2.2 million barrels of oil and 1.3 million tons of greenhouse gas emissions. And, at an average electric utility price of 32¢ per kWh, customers will save approximately $443 million on their electric bills over the life of the installed efficiency measures. These figures continue to show the exceptional cost-effectiveness of investing in energy efficiency and why *energy efficiency continues to be Hawaii's No. 1 electric grid resource*, over fossil and renewables.

In addition to meeting our PY14 kWh savings goals at a very attractive cost for our customers, Hawaii Energy made further organizational restructuring and team additions to better facilitate the development and implementation of forward-looking strategies and innovative new measures. We also continued to enhance our customer engagement and build on existing collaborative relationships with our industry allies, Hawaiian Electric, Contract Manager, M&V Contractor, Hawaii Public Utilities Commission (PUC) and government leaders. Together, these efforts will help ensure that Hawaii Energy continues to provide best-in-class energy conservation and efficiency programs as required for Hawaii's changing energy future.

Operationally in PY14, Hawaii Energy continued its aggressive engagement with hard-to-reach residential and business customers on the neighbor islands; helped more underserved small businesses and restaurants participate in our free lighting retrofit offer known as the *Small Business Direct Install Lighting Program*; accelerated facility-wide LED retrofit, benchmarking and metering programs for Hawaii's large buildings and continued development of multi-island opportunities to assist water and wastewater operations with energy efficiency upgrades and practices.

Most significantly this program year, Hawaii Energy (as the PBFA) was asked to expand the efficiency Program's scope to help facilitate acceleration of Hawaii's transformation to more efficient, clean-energy-tolerant and customer-accommodating electric grids. This included collaborative engagement with the utilities and others to identify and integrate energy efficiency and demand response capabilities through pilot projects focused on identifying controllable loads, energy storage, electric vehicle (EV) charging infrastructure and effective Time-of-Use (TOU) rates. This convergence of our team's continued service and proven capability as PBFA, along with the new initiatives that the PUC added to Hawaii Energy's portfolio of programs, and the strong working relationships we have established thus far promise transformational advances in Hawaii's clean energy progress going forward.

Finally, this Report caps six years of progressive transition from the original legacy rebate program to an innovative, responsive and effective energy conservation and efficiency program today that is providing much needed leadership and expertise in accelerating Hawaii's clean energy future.

Respectfully submitted,

H. Ray Starling

H. Ray Starling, Program Director

BACKGROUND

Program Origins

In 2006, the Hawaii Legislature (see Hawaii Revised Statutes §269-121 through 269-124) authorized the PUC to transfer the existing demand-side management (DSM) surcharge collected by Hawaii's electric utilities to a third-party administrator that would be contracted by the PUC. The transferred surcharge would be called the Public Benefits Fee and would be used by the contracted third-party administrator (the Public Benefits Fee Administrator or the PBFA) to manage and deliver energy-efficiency and demand-side management programs and services under the oversight of the PUC.

By Decision & Order # 23258 (Docket No. 2005-0069) dated February 13, 2007, the PUC announced it would establish a Public Benefits Fund to promote the development of programs and services that increase energy efficiency, reduce electricity consumption and demand, and ultimately decrease Hawaii's dependence on imported fossil fuels. In 2008, the PUC took further actions to direct the Hawaiian Electric Companies to begin collecting a Public Benefits Fee (PBF) surcharge.

On September 18, 2008, the PUC issued a competitive Request for Proposal (RFP) soliciting proposals and pricing for a Program Administrator for the Hawaii Energy Efficiency Program. Science Applications International Corporation (SAIC) [now Leidos Engineering, LLC (Leidos)] submitted a proposal and was subsequently selected to negotiate a contract with the PUC. As a result of those negotiations, a contract was signed on March 3, 2009 between the PUC and SAIC whereby SAIC would become Hawaii's first PBFA and would operate the Hawaii Energy Efficiency Program until December 31, 2013 (with a possible extension until December 31, 2016 at the discretion of the PUC). The initial two-year budget of the contract was $38.4M, followed by a second two-year budget of $67.2M. For both contracts, 70% of the contract value was designated for direct incentives in the form of direct cash incentives or services.

The complete Program Historical Summary (2009 - 2013) is provided in Attachment G.

PROGRAM OVERVIEW, OBJECTIVES & ORGANIZATION

Current Year Program Overview

PY14 – Expanding Collaboration Opportunities, Energy Efficiency Delivery Integration, and Data Analysis Use

Energy Efficiency Auction

- Implemented an open call for projects to provide energy savings to the Program. Received 73 project proposals; four turnkey projects were selected with a total award of $2,087,830.
    - Three projects involved turnkey direct installation provided at low or no-cost to customers. These services directly overcome the barriers to participation for a number of key sectors.
        - Technologies included: thermostats, LED and CFL bulbs, refrigerator and freezers improvements, high-efficiency showerheads, faucet aerators, and advanced power strips.
    - One project included networked smart outlets.
        - These devices provide a number of benefits including greater insight to the energy use of plug loads, the education of the occupants, optimized equipment scheduling and energy management diagnostics.

Integration of Energy Efficiency with Clean Energy initiatives

In PY14, we collaborated with a number of organizations to integrate our work and set the stage for the evolution to Hawaii Energy 2.0. The Program implemented five pilot projects:

- Smart meters – supported the Smart Grid (SG) initiative with Home Area Network (HAN) devices
- Codes and Standards – increased participation and research in support of higher code standards and adoption
- Electric Vehicles (EV) – tested the market for daytime charging incentives
- Demand Response (DR) – explored the potential to reduce and shift water heating loads to the solar day
- Benchmarking – expanded the catalog of local benchmarked sectors to target programs and motivate customer energy action

LEDs Are Ready for Prime Time

PY14 saw a significant increase in the penetration of LED products in the marketplace. We anticipate that falling prices coupled with improvements in quality and a significant growth in the diversity of product types available will continue to shift the market towards LEDs in coming years.

Long-Lead Time Projects Bearing Fruit

The Program recognizes that it often takes time and persistence to influence projects, particularly in large institutions. This year we saw further evidence that these efforts continue to pay off.

- Water/Wastewater Initiative – Continued engagement with industry through training programs and a successful water leak detection project.
- Benchmarking – Three years of instrumentation and data gathering has provided information used to assist customers in their energy decision making. This information is valuable on multiple levels, it informs internal program design and allows us to provide insight for customers and decision makers.

Business Programs

The Business portfolio spent $12,246,110 (91% of target), and achieved 54,611,354 kWh savings (85% of target), 8,414 kW peak demand savings (124% of target), and $81,807,345 in Total Resource Benefit (91% of target).

Implementation	Achievement
Hawaii Energy conducted its first-ever **Energy Efficiency Auction**	Hawaii Energy received proposals from 28 companies representing 68 different projects as a result of this Energy Efficiency Auction. From this pool and based on pre-specified criteria, Hawaii Energy selected three proposals for $1,476,830 to fund. However, as expected, the short project cycle proved to be a significant barrier for many proposed projects and impacted two of the three proposals selected.
Hawaii Energy launched a **Midstream Lighting Program** to offer instant rebates to commercial electric utility account holders at the point of purchase	A later than anticipated launch in the Program Year resulted in sign-up from one lighting distributor. As such, energy and demand savings were below expectations. However, a significant amount of excitement and interest was generated in the market sector and an additional six distributors have expressed interest in joining the program in PY15.
Continued success in LED Lighting projects	• LEDs in the BEEM Program generated energy (first year) and demand savings of 3,882,675 kWh and 543 kW, respectively. • LEDs in the CBEEM Program generated energy (first year) and demand savings of 14,676,354 kWh and 2,030 kW, respectively.
Launched a **15% Contractor Bonus in the Small Business Direct Install Program** to reinvigorate the market	Over the Program Year, 570 small businesses and restaurants were served, providing annual energy savings to these customers of over 5.5 million kWh.
Continued success in Commercial Water Pumping Improvements	Hawaii Energy provided a $135,000 incentive for the installation of a system-wide leak detection system on the water supply system on Hawaii Island that is expected to save 241,023 kWh per year.
Conducted a **Direct Install Refrigeration Measures Pilot Program**	Hawaii Energy worked with a contractor to develop a pilot program to offer commercial refrigeration energy efficiency measures, specifically new refrigeration gaskets, strip curtains and automatic door closers. The pilot program was successful with cumulative savings estimated at 265,796 kWh per year for nine grocery stores on Oahu at a cost of approximately $50,400 in incentive funds.

Residential Programs

The Residential portfolio spent $9,978,127 (90% of target), and achieved 61,971,862 kWh savings (88% of target), 10,083 kW peak demand savings (97% of target) and $63,733,260 in Total Resource Benefit (90% of target).

Implementation	Achievement
Introduced the **Home Energy-Saving Kits**, an online store pilot program.	Distributed a total of 4,953 energy saving kits over the six-week online store pilot. Utilized online marketing and social media campaign to drive participation.
Continued to **diversify measure portfolio away from CFLs**.	Rebated 527,905 LEDs in PY14, an increase of 183% from PY13. CFLs dropped to 1.3 million in PY14, down from 1.5 million in PY13.
Launched the ***Energy $mart for Homes*** **Multifamily Direct Install Program**.	Provided turnkey delivery and installation of in-unit energy-saving measures including high-efficiency lighting, high-efficiency showerheads, faucet aerators and advanced power strips to a total of 1,524 residential dwellings.
Continued the **Rid-A-Fridge program** in collaboration with the Hawaii Foodbank (Oahu), The Maui Food Bank and The Food Basket (Hawaii Island).	Participation more than doubled that of PY13, with a total of 864 units surrendered for recycling. A total of $7,035 in rebates was donated by customers to Hawaii's food banks.
Re-launched the **Solar Water Heating Tune-Up Program.**	The *Tune-Up* program far surpassed expectations with the rebating of 1,697 tune-ups within four months; more than doubling the number performed during the same timeframe in PY13.
Continued the **Solar Water Heating Grant program** with the Hawaii Community Economic Opportunity Council (HCEOC).	70 solar water heating systems were installed for "in-need" homes on Hawaii Island.
Launched the **Window Air Conditioner (AC) Trade-Up** program, which offers residents a $50 rebate for the purchase of a qualified window AC when surrendering an old working unit for pick-up and recycling.	282 rebates were issued for units purchased through 10 participating retailers in PY14, achieving savings of 92,284 kWh (first year) and 47 kW with $14,100 in incentives.
Continued **bi-monthly residential e-newsletter** highlighting the program, residential offers and rebates.	Grew subscriber list to roughly 10,800, up 16.7% since the end of PY13. Achieved open-rate average of 34.12%, which is above average rates by industry standards and indicate that the customers are engaged and interested in the content they receive.

Transformational Programs

Through the expertise and collaboration of Hawaii Energy and its subcontractors throughout PY14, the Transformational program met and exceeded its goals for behavior modification, professional development, and technical training for the Program Year.

Implementation	Achievements
"Sharing the Aloha" community workshops expanded to target housing communities where the tenants had to pay their own electricity bill for the first time.	• Achieved a 26% increase or 4,201 attendees • 900% increase in serving Public Housing Authority occupants
Social media and electronic communication – In previous years, Kanu Hawaii developed energy-saving "memes," (an image, video, phrase, etc.) that is spread via the Internet. This year focused on expanding delivery and reach of memes through social media.	• 34% increase social media activity or 936,846 views • 70% increase in engagement or 64,866 actions taken after viewing • The use of unique Hawaii words, terms and phrases is extremely effective in increasing views, likes, shares, and comments on Facebook
60 Day Energy Challenge - Piloted an offering with Kanu Hawaii to use energy-saving contests hosted by employers as a way to reduce household energy consumption.	• Five companies enrolled with a total of 365 participants • One company reported that the facility department gained internal support in implementing energy-saving projects due to the competition • Employers benefited in terms of morale and team-building
Professional Energy Efficiency Sales Trainings provided both in-person and online trainings to participants from all islands on how to more effectively get projects approved.	• 80 companies/organization viewed 500 online video trainings • 235 individuals participated in the trainings, representing 130 companies/organizations
The **Building Operator Certification (BOC) courses** had increasing success in improving the participation of the appropriate target audience from the non-degree holding workforce.	• 24% increase or 67 participants from the hospitality, entertainment industry, and hospital industries
Energy education in the schools built on previous years to include community Energy Expos in which parents, students, and the community were invited to learn about conservation and efficiency through student-led activities	• 332 teachers from all islands participated in educator workshops • Seven Energy Expos with an estimated 600 attendees including parents, teachers, students, and local community members organized by the schools staff and students
Provided non-monetary support and facilitation for the development of the **Facility Management Degree Program** at the University of Hawaii West Oahu (UHWO)	• Three years after the first planning meeting in PY12, the UHWO announced it will accept applications into the program in Fall 2015 • Co-sponsored two community outreach and fundraising events with the Hawaii Chapter of the International Facility Management Association (IFMA) to nearly 100 prominent Hawaii community and business leaders to gain their support for the program
The **Clean Energy Ally (CEA) program** was launched to support trade allies in the marketplace. All groups and individuals involved in the sale and installation of energy-related equipment are eligible. The CEA program trains allies in program offerings and processes, provides opportunities for professional energy efficiency sales training and offers events for cross-selling and networking.	• Certified 226 individual allies, representing 140 unique businesses • Created the online Clean Energy Ally vendor directory, which helps facilitate the customers' selection of energy efficiency solutions

Implementation	Achievement
Smart Grid Initiative – Enhanced implementation of the utility smart grid project with complementary tools through the Program. The first pilot project implemented an In-Home Display (IHD) and mobile app to allow customers to receive information available only from their smart meters.	• Launched the first collaborative Smart Grid Home Area Network (HAN) Pilot project with Hawaiian Electric Company (HECO) and Silver Spring Networks • Deployed 44 customer IHDs to monitor energy in near real-time with 25 of the users actively looking at the device on weekly basis • New features, more interaction and peer comparisons are needed to foster increased activity to reduce participant energy consumption • Analyzed the 15 min interval data from 4,000 residential customers and developed analytic algorithms to identify the customer load profile characteristics
Electric Vehicles – Piloted a daytime charging discount as a means to encourage the use of EV chargers at times when solar PV is at its mid-day peak. An additional offering for new EV owners included an EV energy-saving kit to offset a portion of their charging at home.	• 54 participants enrolled in EV Daytime Charging Pilot • 50 kits distributed to EV drivers with the assistance of local EV dealerships • Determined lower price was not as effective in changing behavior as anticipated • Identified need to offer method to transfer home PV credits to workplace charger
Demand Response (DR) – Piloted DR-enabled heat pumps in order to shift water heating loads to times when renewable energy is most plentiful.	• 10 households enrolled • Achieved an estimated 46% decrease in water heating energy usage • Conducted over 30 DR events per site • Able to shift an average of 19% load across 19 sites • Identified the need to improve setpoint control to maximize load shift
Benchmarking – Offered free benchmarking services to benefit building owners to help them understand their energy use intensity (EUI) as compared to others and discover opportunities to improve performance.	• Completed 428 benchmarks where 108 were analyzed in ENERGY STAR Portfolio Manager® and 320 were benchmarked using EUI • 9 buildings earned an ENERGY STAR® label • Specific segments targeted – AOAO, office, supermarket, banking • Used benchmarks to engage with customers
Water and Wastewater Initiative – Developed a Water/Wastewater Catalyst Fund to invigorate stalled energy projects that were stalled for lack of funding or other resources.	• Funding to County Water Agency for leak detection sensors. System discovered 235 gallon per minute leak that was repaired within a day of discovery. • Provided five sets of pump efficiency assessment kits to local water assistance groups and provided hands-on training sessions at pump stations

Bill $aver Program

Hawaii Energy provided the PUC with Bill $aver on-bill financing program development support focused on: Program Management, Contractor Management, IT Support, and Marketing & Outreach. Hawaii Energy also worked closely with the other program entities - HECO and AFC First (Finance Program Administrator) - on process and IT system design issues, and worked with the PUC and the potential investor on market analysis, estimated savings analyses, contracting terms, and supply chain and logistics issues.

Significant activities in PY14 included the following:

Program Management

- Provided market sizing by system size, island, and panel type based on Hawaii Energy's Solar Water Heater program data from the previous three program years in order to provide the PUC and the potential investor with realistic estimates for the deployment of the safe harbored 4x10 solar thermal panels. This data was critical for refining the underlying economics of the investment for the potential investor.
- Provided estimated savings analyses for potential customers in order to facilitate discussions and to drive recommendations for Bill $aver program refinement. This analysis resulted in in-depth discussions and weighing of the likely attractiveness of the program from a customer perspective, a key factor in driving overall program success, along with the ways to address the program's cost structure in order to better drive customer savings.
- Provided introductions of local distributors to the potential investor and assisted in their follow-on discussions on addressing logistics and supply chain issues, to include the challenges in deploying the potential investor's safe harbored solar thermal panels.

Contractor Management

- Gathered further industry feedback for the PUC through additional interactive sessions with solar water heater contractors and suppliers in order to indicate the levels of interest in the Bill $aver program offering based on program design and expected customer savings.
- Provided feedback on numerous revisions of the Master Services Agreement that would be required between the potential investor and the contractors, based on program experience.

IT Support

- Refined the Bill $aver informational website to provide customer-facing information on the program.
- Refined the Bill $aver contractor portal (both internal and with AFC First) through several rounds of testing, including online project submission, tracking and approval tools that allowed for efficient transfer of information between AFC First, Hawaii Energy and the participating contractor.

Marketing & Outreach

Refined the Bill $aver marketing brochure from the trifold design to a one-page flyer in order to provide a low cost printing option for marketing collateral to support customer education and engagement by both participating contractors and Hawaii Energy.

Achievements

- The Program invested a total of $36,029,967 (**Table 15**) to deliver 1,525,693,183 kWh (system-level, **Table 18**) over the measure lives resulting in a cost per kWh of $0.0236. The Program's CSE in PY14 was $0.0303/kWh, as calculated in **Table 1** below.
- Delivered $22,224,237 in incentives (**Table 17**) driving customer bill savings of $43,315,367 annually and over $435,893,642 over the life of the measures installed. See **Table 1a** for details of customer energy cost savings by island and rate tariff.
- A first year Program level savings of 116,583,217 kWh (**Table 17**).
- Diversified portfolio away from reliance on CFLs by 24%, while increasing LEDs by 71% (**Table 24**).

Table 1
Levelized Cost of Saved Energy

Lawrence Berkeley National Laboratory, March 2014 – CSE Report - http://emp.lbl.gov/sites/all/files/lbnl-6595e.pdf

$$Capital\ Recovery\ Factor = [A*(1+A)^{\wedge B}]/[(1+A)^{\wedge B}-1]$$

$$Levelized\ CSE = \frac{C\ x\ (Capital\ Recovery\ Factor)}{D}$$

			w/o Transformation	Total Program
Discount Rate	A		6%	6%
Estimated Program Savings Life	B		11.1	11.1
Total Program Budget Less Direct Install Programs	C*	$	32,354,987	$ 36,029,967
Annual kWh Saved at Customer Level	D		134,596,241	134,596,241
	A*(1+A)^B		0.114	0.114
	(1+A)^B-1	÷	0.907	0.907
	Capital Recovery Factor		0.126	0.126
	C	$	32,354,987	$ 36,029,967
	Capital Recovery Factor	x	0.126	0.126
	D	÷	134,596,241	134,596,241
	Levelized CSE	**$**	**0.0303 / kWh**	**$ 0.0338 / kWh**

Table 1a Customer Energy Cost Savings by Island									
First-Year Energy Cost Savings									
Island	**R**	**G**	**J**	**P**	**DS**	**F**	**Total**	**kWh - 1st yr**	**Avg. Cost $/kWh***
Oahu	$ 16,180,159	$ 1,421,905	$ 5,190,603	$ 5,936,264	$ 1,535,175	$ 56,532	$ 30,320,638	99,244,529	$ 0.30551
Hawaii Island	$ 4,634,051	$ 543,607	$ 764,194	$ 800,616	$ 0	$ 0	$ 6,742,467	17,501,912	$ 0.38524
Maui	$ 3,514,422	$ 220,733	$ 667,202	$ 1,795,440	$ 0	$ 0	$ 6,197,798	17,700,427	$ 0.35015
Molokai	$ 17,832	$ 13,885	$ 0	$ 0	$ 0	$ 0	$ 31,717	73,138	$ 0.43366
Lanai	$ 22,747	$ 0	$ 0	$ 0	$ 0	$ 0	$ 22,747	76,236	$ 0.29838
Total	$24,369,211	$2,200,130	$6,621,999	$8,532,320	$1,535,175	$56,532	$43,315,367	134,596,241	$0.32182
Customer Lifetime Energy Cost Savings									
Island	**R**	**G**	**J**	**P**	**DS**	**F**	**Total**	**kWh - Lifetime**	**Avg. Cost $/kWh***
Oahu	$ 129,891,400	$ 20,204,988	$ 56,836,486	$ 80,689,316	$ 22,066,079	$ 726,257	$ 310,414,526	1,034,555,912	$ 0.30005
Hawaii Island	$ 37,813,269	$ 7,692,286	$ 8,629,445	$ 10,295,512	$ 0	$ 0	$ 64,430,513	167,757,729	$ 0.38407
Maui	$ 28,101,027	$ 3,272,010	$ 8,502,113	$ 20,837,143	$ 0	$ 0	$ 60,712,293	174,146,566	$ 0.34863
Lanai	$ 56,235	$ 194,383	$ 0	$ 0	$ 0	$ 0	$ 250,618	694,161	$ 0.36104
Molokai	$ 85,692	$ 0	$ 0	$ 0	$ 0	$ 0	$ 85,692	428,407	$ 0.20002
Total	$195,947,623	$31,363,667	$73,968,044	$111,821,971	$22,066,079	$726,257	$435,893,642	1,377,582,777	$0.31642

*Average per kWh customer electric cost based on actual participants' total bill energy costs for calendar year 2013.

Table 1b Program Year 2014 - Effective Average Utility Rate for Participants* ($/kWh)						
	R	**G**	**J**	**P**	**DS**	**F**
Oahu	$ 0.3300	$ 0.3400	$ 0.2800	$ 0.2800	$ 0.2600	$ 0.2900
Hawaii Island	$ 0.3900	$ 0.4800	$ 0.3800	$ 0.3300		
Maui	$ 0.3600	$ 0.4000	$ 0.3500	$ 0.3300		
Molokai	$ 0.4300					
Lanai	$ 0.4400	$ 0.5300				

*Average per kWh customer electric cost based on actual participants' total bill energy costs for calendar year 2013.

Significant Event(s)

The Business program took a significant step to formalize its efforts in building a network of contractors, engineering firms, distributors and other market players that provide energy efficiency products and services to customers by creating the Clean Energy Ally program. By joining this program, these companies established a concrete relationship and affinity with the Hawaii Energy Program beginning with obligatory training about Hawaii Energy's mission, role and program. In addition to being listed on the Hawaii Energy website, these Clean Energy Allies will be offered "perks" beginning with training opportunities. Significant headway was made with the recruitment of 226 individuals representing 140 different companies. The program will continue to grow and nurture the CEA network as they are recognized as a force multiplier of the Hawaii Energy program itself.

In PY14, the Residential program hosted four solar water heating contractor meetings. These meetings had a total audience of almost 200 people. They served as an opportunity to present Participating Contractors with Hawaii Energy's new initiatives and gather feedback regarding current industry trends in solar water heating.

The Transformational program collaborated with the NEED Project to pilot seven Energy Expos. Energy Expos are student-led, teacher-hosted community events in which parents and community members learn about saving energy in the home. A total of seven Energy Expos with an estimated 600 attendees including parents, teachers, students and local community members were held in PY14.

Lessons Learned

The Business program piloted a contractor bonus opportunity within the Small Business Direct Install program. The bonus, specifically 15% of the contract value, grew project submissions and accelerated project completion rates. This was also effective in refocusing contractors had secured larger more profitable work in the marketplace. In Hawaii where labor constraints exist, this was an instrumental tool that benefitted the program.

The Business program also launched a midstream commercial lighting program. While it was a little slow to get started, as it is a relatively new concept for distributors and customers, it is now showing steady growth. The Program has also found that education of distributor sales staff is a key component to ensure quality participation through this channel.

The Residential program explored an online distribution channel for low-cost energy-saving kits. The program proved very effective at cost-effectively engaging over 3,400 customers in six weeks. The Program will continue to expand online programs and take advantage of social media advertising and web analytics to better target customers.

The Transformational program saw great promise in the smart meter pilot and its ability to provide valuable information to engage with customers. These efforts also demonstrated the Program's ability to integrate program design with load profile analysis and continue to assist the utility with furthering renewable integration.

Hawaii Energy places great value not only in our messaging on energy conservation and efficiency, but also in the way it is delivered. We have found that choosing the appropriate representative for each event, training or interaction helps utility customers better understand the message because they can relate to the person that is delivering it. Because of this, the Transformational program continues to collaborate with local and national non-profit organizations, recognized experts in the energy field, and leaders in the community to help deliver Program efficiency messages. We have also leveraged our work with students to make an impact on communities.

Program Objectives

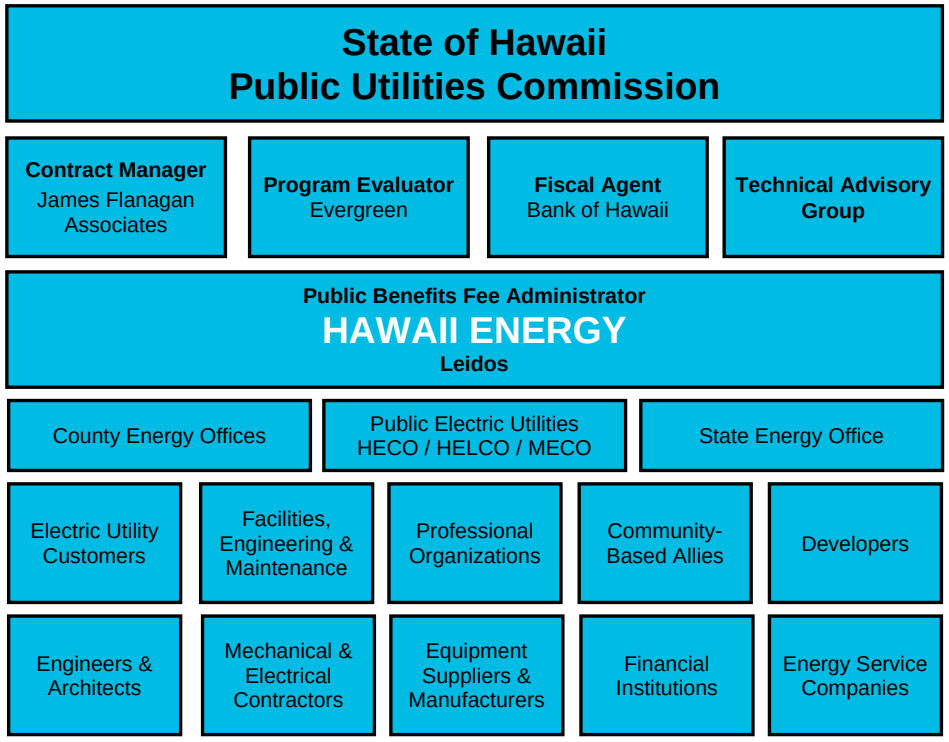
In addition to the PBFA Contract requirements and performance award goals, the Program's broader objectives for PY14 included:

- Reduce the State's demand for electricity, and by doing so, decrease the State's dependence on imported fuel.
- Explore new innovative strategies in energy conservation and efficiency.
- Expand the Program's outreach to the Neighbor Islands and other hard-to-reach constituents.
- Support the Hawaii Clean Energy Initiative and related efforts aimed at improving Hawaii's energy sustainability.
- Leverage strategic agencies and allies as "force multipliers" to extend the Program's outreach.
- Serve as one of the State's critical leaders, advocates and sources of information for energy conservation and efficiency efforts.
- Evolve the Program to affect behavior change through transformational programs, peer comparisons and enhanced information to increase personal awareness of energy consumption, as well as traditional cash incentives for implementing energy efficiency measures.
- Reach out to small businesses on a more individualized basis to enhance their viability as an on-going concern.

Oversight and Support

During PY14, Hawaii Energy collaborated with a wide range of support organizations and oversight entities. These oversight entities were comprised of the PUC, Contract Manager (James Flanagan Associates), Program Evaluator (Evergreen Economics), Fiscal Agent (Bank of Hawaii) and a Technical Advisory Group (TAG). The TAG is made up of local energy stakeholders who provide their expertise, technical guidance and support to ensure success of the Program. Together with the Program's supportive trade allies and community groups, Hawaii Energy continually worked to improve the accountability, functionality, offerings, efficiency and cost-effectiveness of the Program. The oversight and support organizations are shown in **Figure 1**.

Figure 1
Program Oversight and Support Organizations

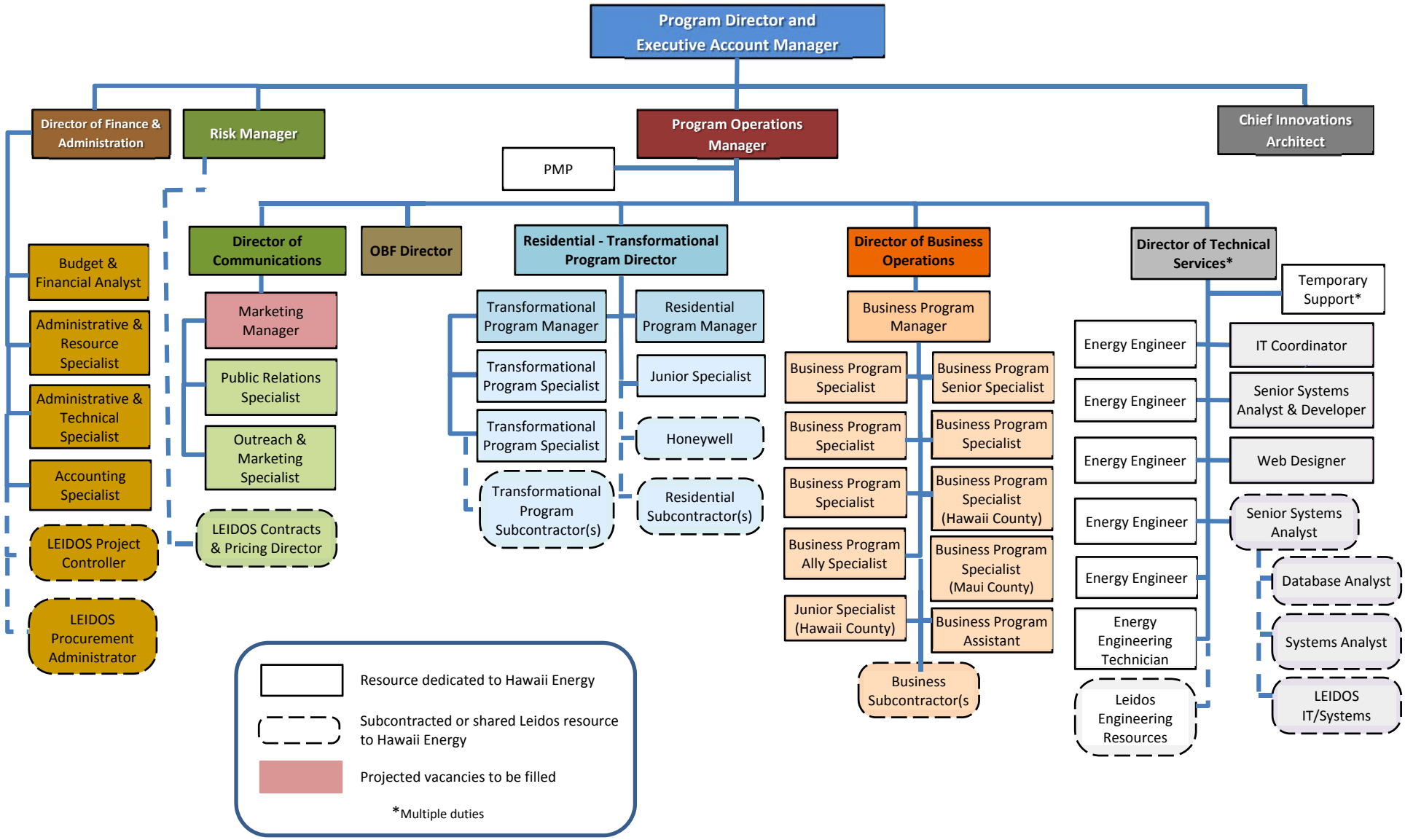


The foundation of the Program's organization is a core team of Leidos professionals in Honolulu, supported by off-site staff of uniquely skilled professionals throughout Leidos' organization nationwide. The Program also has a number of key subcontractors that together round out the Hawaii Energy team. These key subcontractors include:

- **Action Research** – Provided Community Based Social Marketing (CBSM) support to conduct effective campaigns encouraging energy-saving behavior changes.
- **Association of Energy Engineers (AEE)** – Provided technical training for Certified Energy Managers and Certified Energy Auditors.
- **Blue Planet Foundation** – Provided WEfficiency platform to support crowd-sourced energy efficiency projects.
- **EEFG, Inc.** – Provided education, training, coaching and analysis to help energy users and service providers realize and express the true value of improving energy efficiency.
- **Helen N. Wai, LLC** – Provided "*Sharing the Aloha*" workshops to assist communities and organizations in the areas of financial literacy and energy efficiency.
- **Home-Tech** – Provided solar water heating systems and commercial equipment inspections on Hawaii Island.
- **Honeywell** – Provided customer service and administrative functions to support the residential programs, as well as check processing services for both residential and business incentive programs.
- **JN Plumb Tech** – Provided solar water heating systems and commercial equipment inspections on the islands of Lanai, Maui and Molokai.
- **Kanu Hawaii** – Provided transformational social media messaging, Pay-It-Forward advanced power strip distribution and 60-day Energy Challenge implementation support.
- **Kupu** – Provided energy efficiency interns for Program through Rewarding Internships for Sustainable Employment (RISE) program.
- **National Energy Education Development (NEED) Project** – Provided training for teachers to understand and be better able to teach energy efficiency in K-12 schools.
- **Opower** – Provided peer group comparison Home Energy Reports to residences in Maui County, Hawaii County and select parts of Honolulu County.
- **University of Hawaii Outreach College** – Provided technical training for building operators through their existing Continuing Education programs.

Program Organization

The Program's organization at the end of PY14 (including pending hires) is shown in the chart below:



PERFORMANCE INDICATORS AND RESULTS

Program Performance Indicators and Related Targets

Overview

The following Performance Indicators were established in the PBFA Contract in order to set measureable performance targets that meet the PUC's objectives and to provide the basis for financial incentives as a reward for superior performance in achieving explicit Program goals. The Performance Indicators for PY14 are:

1. Cumulative Annual Electric Energy Savings (Program Level)
2. Peak Demand (Program Level)
3. Total Resource Benefit (Program Level)
4. Market Transformation
5. Island Equity (Broad Participation)

Table 2 defines the minimum, target and maximum award levels for each Performance Indicator used to measure the Program's performance. Details of each indicator and its related target follow.

Table 2
Performance Indicators

Indicator		Minimum	Target	Maximum
First Year Energy Reduction (kWh)		101,112,173	134,816,230	148,297,852
Peak Demand Reduction (kW)		12,938	17,250	18,975
Utility Cost Avoidance (TRB)		$ 120,554,939	$ 160,739,919	$ 176,813,911
Market Transformation	Behavior Modification	12,600	18,000 Participants	
	Professional Development	750	1,000 Participants	
	Technical 'Know-How'	175	250 Participants	
	Hawaii Energy Ally Program	0 Allies	200 Allies	
	Benchmarking	200	500 Sites	
	Codes & Standards	2 items	3 Items	
	Demand Response	2 items	3 Items	
	Smart Grid	2 items	3 Items	
	Electric Vehicle	2 items	3 Items	
Indicator		**Minimum (80%)**	**Target ($)**	**PY14 % Contribution***
Island Equity	Honolulu County	$ 14,414,331	$ 18,017,914	73.3 %
	Hawaii County	$ 2,576,095	$ 3,220,118	13.1 %
	Maui County	$ 2,674,419	$ 3,343,024	13.6 %

*Based on Actual PY14 PBFA Contribution

Performance Indicator #1: Cumulative Annual Electric Energy Savings (Program Level)

Target: 134,816,230 kWh

Annual electric energy eavings directly benefit the State's goal of achieving energy independence by reducing the consumption of imported fossil fuels in proportion to the fossil-fueled units used to serve this load. The program participants directly benefit through lower electricity costs.

The Program Level Annual Energy Savings Achievement of 116,583,217 kWh currently equates to 1,346,843 MMBTUs or avoided use of 220,140 BBLs of liquid fossil fuels in Hawaii; see **Table 3** and **Table 3a**.

Table 3
Estimation of Potential Fossil Fuel Avoidance

Potential Barrels (BBLs) of Fossil Fuels Avoided in PY14					
Annual Program Level Energy Savings Achievement			116,583,217	kWh/Yr.	
Average Program Attribution to System Level Impact	÷		78%		
System Level Gross Generation Energy Impact			149,034,270	kWh/Yr.	
Est. 2014 Electrical Generation Source Distribution					
Renewable Energy Generated (2014 RPS Report)			1,398,561,000	kWh/Yr.	
Less avg. 4.7% T&D Losses (HEI 10K 2014)	x		95.3%		
Est. of Renewable Energy Sold			1,332,828,633	kWh/Yr.	14.8%
Est. Fossil-Fueled Energy Sold	+		7,643,413,367	kWh/Yr.	85.2%
Total Energy Sold			8,976,242,000	kWh/Yr.	
Customer-Sited - Grid Connected Renewable DG			514,999,000	kWh/Yr.	5.7%
System Level Gross Generation Energy Impact			149,034,270	kWh/Yr.	
% System Average Fossil-Fuel Generation	x		85.2%		
Reduction Target Impact in Fossil Fuel-Generation			126,905,060	kWh	
Energy Avoided into Generators					
Fossil-Fuel Energy Generated			126,905,060		
Avg. System Generating Heat Rate	x		10,613	BTU/kWh	
Energy Required for Fossil-Fueled Electricity Production			1,346,843,403,996	BTU/Yr.	
Generation Liquid Fossil Fuel Mix					
Energy in BBL of Low Sulfur Fuel Oil			6,200,000	BTU/BBL	79.0%
Energy in BBL of #2 Fuel Oil (Diesel)			5,860,000	BTU/BBL	19.0%
Energy in BBL of Naptha			5,335,500	BTU/BBL	2.0%
Average System BTU/BBL			6,118,110	BTU/BBL	100.0%
Energy Required for Fossil-Fueled Electricity Production			1,346,843,403,996	BTU/Yr.	
Average System BTU/BBL	÷		6,118,110	BTU/BBL	
Number of Barrels of Fossil-Fuel Avoided			220,140	BBLs/Yr.	
Number of Barrels of Fossil-Fuel Avoided			220,140	BBLs/Yr.	
2014 Avg Cost per BBL for Fossil Fuels used for electricity	x	$	126	per BBL*	
Potential Fossil Fuel Cost Savings to State		$	27,779,522	per year	

*Price dropped to $65/BBL in March 2015. DBEDT Monthly Energy Trends:
http://files.hawaii.gov/dbedt/economic/data_reports/energy-trends/Monthly_Energy_Data.xlsx

Environmental Program Benefits

Reducing energy consumption has significant environmental benefits. In the past year, the energy saving efforts of all the participants have resulted in lowering Hawaii's environmental footprint as demonstrated in **Table 3a**.

The reduction of emissions was equivalent to removing over 21,000 passenger vehicles from the roads.

The fossil fuel reduction was the equivalent of the generating output of nearly 347,000 PV solar panels.

Table 3a
PY14 - Potential Green House Gas Equivalencies Avoided

System Level Gross Generation Energy Impact	149,034,270	kWh/Yr.
Green House Gas Reduction (www.epa.gov/egrid)**		
Energy in kWh	**149,034,270**	kWh/year
Energy in MWh	149,034	MWh/year
CO2 - Carbon Dioxide	129,773	Tons per Year
CH4 - Methane	8	Tons per Year
N2O - Nitrous Oxide	2	Tons per Year
Green House Gas Equivalencies* **		
Less Passenger Vehicles	21,635	
Less miles/year driven (avg. passenger vehicle)	244,682,690	
Wind turbines installed	28	
Acres of US forest sequestering carbon in one year	84,235	
Fossil Fuel Reduction Comparison to PV and Solar Water Heating		
Rooftop PV Panels (300W) to offset same energy usage	346,851	
Solar Water Heating Systems to offset same energy usage	72,172	

** Power Profiler - HICC - Oahu - Excel tool and Website: http://oaspub.epa.gov/powpro/ept_pack.charts

*** EPA's Greenhouse Gas Equivalencies Calculator:
http://www.epa.gov/cleanenergy/energy-resources/calculator.html

Performance Indicator #2: Peak Demand Savings

Target: 17,250 kW

Peak Demand Reduction is focused on reducing the electrical load during the traditional peak demand period between 5:00 p.m. and 9:00 p.m. on weekdays, as illustrated in **Figure 2**. System demand (load) is typically highest when humid nights increase air conditioner usage in addition to the normal evening water heating loads. This system peak load is used to plan the requirements for additional generation capacity. Reducing the load reduces the cost to the utility customer by deferring the need for an additional unit of generation. Aggressive peak load reductions and load shifting technologies may allow for the retirement of less efficient generation units as more renewable generation is available.

Program participants benefit from lower electrical costs and all customers benefit from the avoided cost to provide additional units of generation to meet increasing electrical peak demand. The target of 17,250 kW is equivalent to the average peak power consumption of 17,250 homes at 1 kW each, shown in **Figure 3.**

Figure 2
Average Daily Seasonal Demand (Load) Profile + Rooftop PV Generation

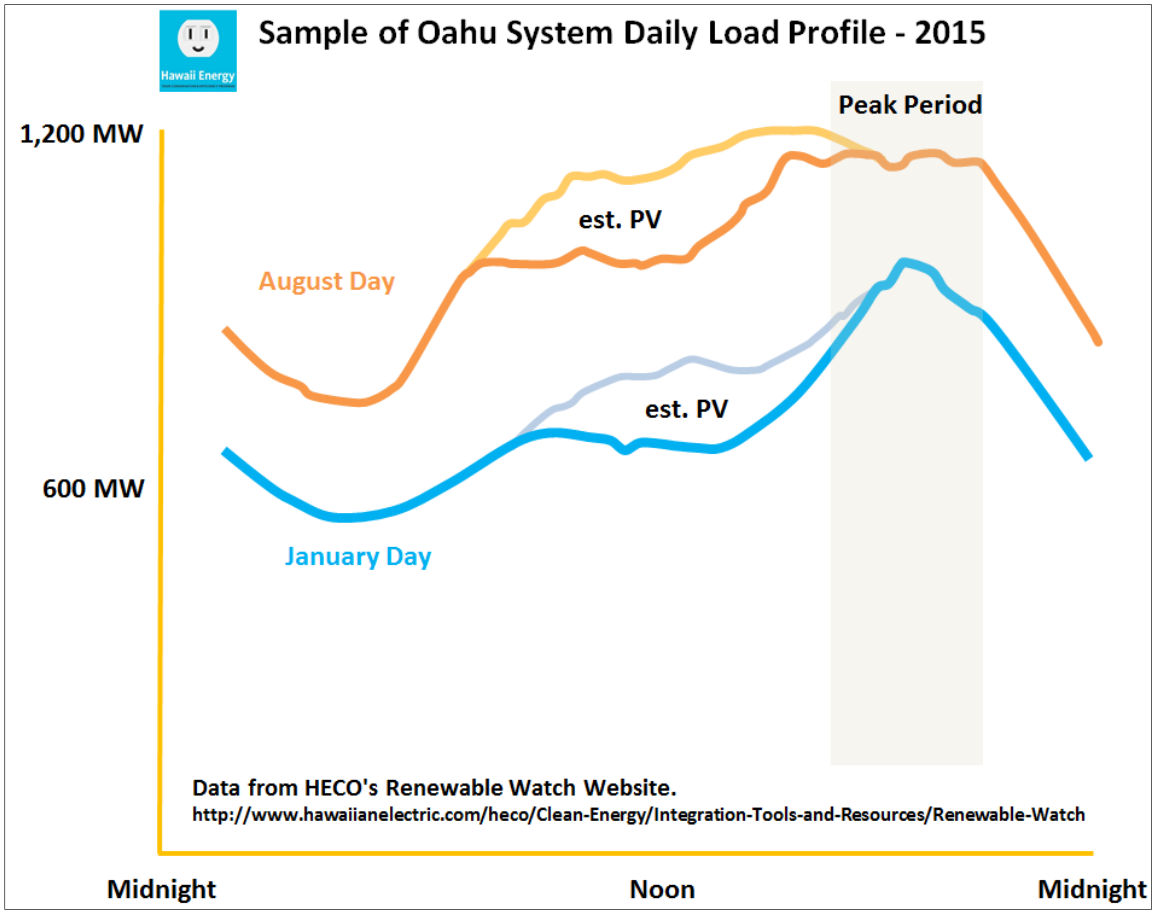
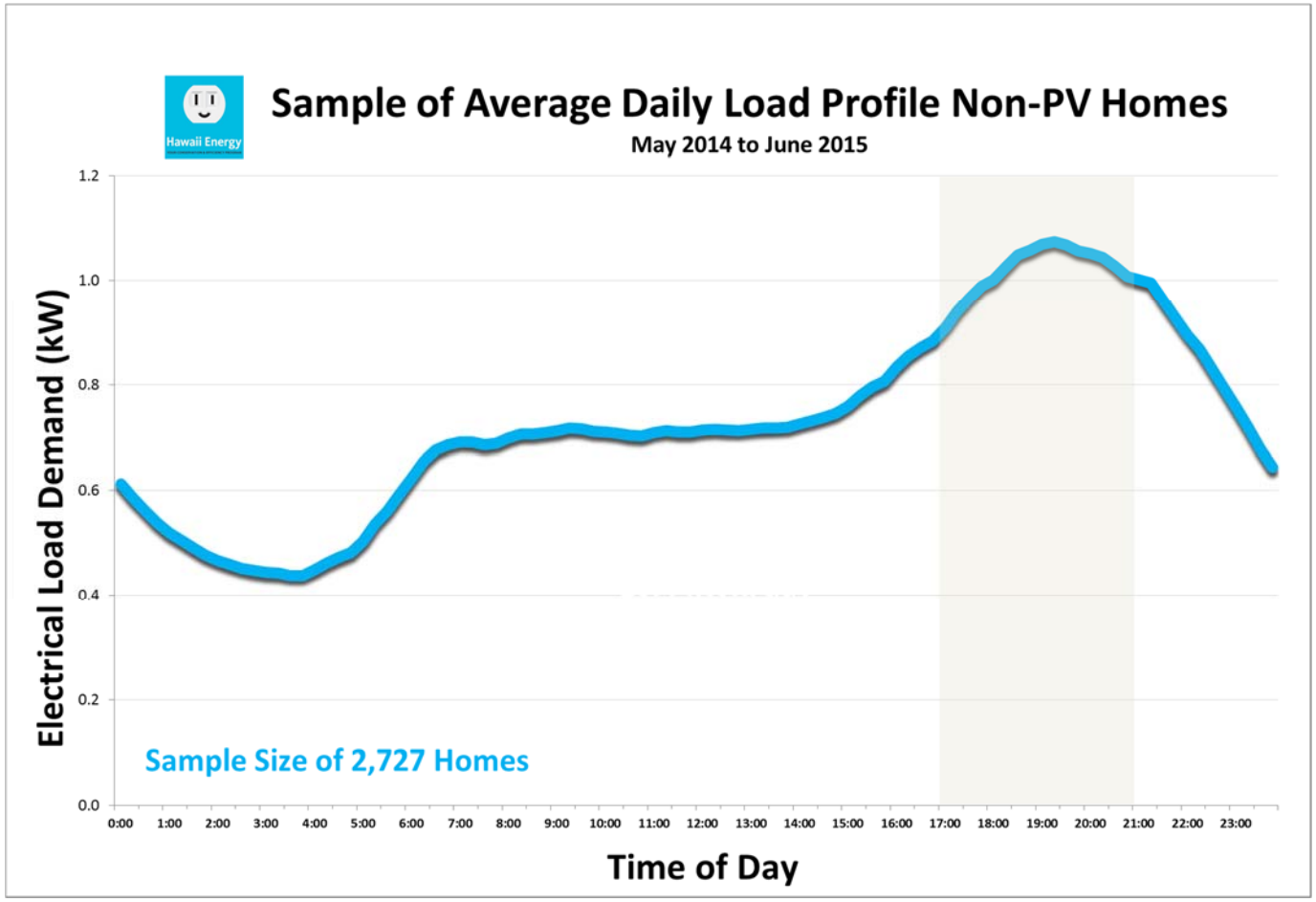


Figure 3
Average Home Daily Demand (Load) Profile



Performance Indicator #3: Total Resource Benefit (TRB)

Target: $160,739,919

The Total Resource Benefit (TRB) is the estimated total net present value (NPV) of the avoided cost for the utility from the reduced lifetime demand (kW) and energy (kWh) from energy efficiency projects and measures. The utility costs were determined using average avoided cost data for installed capacity to meet demand and cost to produce energy that was provided by HECO IRP4 and adjusted under the advice of the Contract Manager. Average annual avoided cost for capacity and energy for calendar year 2014 escalated for a 20-year period was the basis for the analysis. The TRB incorporated avoided transmission and distribution costs into the avoided energy and capacity costs. The time value of money is represented by a discount rate of 6%. The discount rate is used to convert all costs and benefits to a "net present value" for comparing alternative costs and benefits in the same year's dollars.

Table 4 provides an example of the TRB calculation as if a hypothetical project consisted of a single measure with an eight-year life, achieving the program demand and energy targets. In the implementation of specific Program measures, individual calculations are done for each measure then summed together to determine the Program's TRB result.

Table 4
Example of the TRB Calculation using Look Up Table

	Life								kW Target	kWh Target		Project Cost
	8	Discount Rate							25.0	25,000		$ 45,000
		6%	Utility Avoided Cost		NPV for each Year		Cumulative NPV		TRB			
Year	Measure Life	NPV Multiplier	$/kW/yr.	$/kWh/yr.	$/kW/yr.	$/kWh/yr.	$/kW/yr.	$/kWh/yr.	Capacity Benefit	Energy Benefit	Total Resource Benefit	TRB/TRC Ratio
2014	1	1.00	$ 353	$ 0.104	$ 353	$ 0.1037	$ 353	$ 0.1037	$ 8,830	$ 2,592	$ 11,422	0.25
2015	2	0.94	$ 371	$ 0.109	$ 350	$ 0.1027	$ 703	$ 0.2064	$ 17,570	$ 5,160	$ 22,730	0.51
2016	3	0.89	$ 383	$ 0.112	$ 340	$ 0.1000	$ 1,043	$ 0.3064	$ 26,081	$ 7,660	$ 33,741	0.75
2017	4	0.84	$ 386	$ 0.113	$ 324	$ 0.0953	$ 1,368	$ 0.4016	$ 34,188	$ 10,041	$ 44,229	0.98
2018	5	0.79	$ 388	$ 0.114	$ 307	$ 0.0902	$ 1,675	$ 0.4919	$ 41,866	$ 12,297	$ 54,162	1.20
2019	6	0.75	$ 389	$ 0.114	$ 291	$ 0.0854	$ 1,965	$ 0.5773	$ 49,135	$ 14,432	$ 63,567	1.41
2020	7	0.70	$ 392	$ 0.115	$ 276	$ 0.0812	$ 2,242	$ 0.6584	$ 56,042	$ 16,461	$ 72,503	1.61
2021	8	0.67	$ 391	$ 0.115	$ 260	$ 0.0763	$ 2,502	$ 0.7348	$ 62,538	$ 18,369	$ 80,907	1.80
2022	9	0.63	$ 395	$ 0.116	$ 248	$ 0.0727	$ 2,749	$ 0.8075	$ 68,728	$ 20,187	$ 88,915	1.98

Performance #4: Market Transformation

Targets:

Transformational Programs

Behavior Modification	18,000 Participants
Professional Development	1,000 Participants
Technical Training	250 Participants
Hawaii Energy Ally Program	200 Allies

Pilot Projects

Benchmarking	500 Sites
Codes & Standards	3 Items
Demand Response	3 Items
Smart Grid	3 Items
Electric Vehicle	3 Items

Transformational efforts are those that involve education, training and other legislative support activities that may not result in direct quantifiable energy savings. The focus of this year's target is to develop community partnerships to leverage their reach and expertise in delivering energy education to specific "hard-to-reach" communities and industries. These efforts contribute to development of an infrastructure and mindset that will result in societal changes and increased energy savings in the future.

Figure 4 provides a summary of the Market Transformation programs for PY14.

Figure 4
Summary of Transformational Programs

Behavior Modification	3rd Annual Hawaii Sustainability in Higher Education Summit
	Energy Efficiency Literacy at Scale – 60 Day Energy Challenge
	Energy Efficiency Literacy at Scale – Adoption of Energy-Saving Products
	Energy Efficiency Literacy at Scale – Social Media Messaging
	Green Office Program
	K-12 Community Energy Fairs
	Kapiolani Community College, Disruptive Sustainability Workshop
	Sharing the Aloha, Energy Literacy Community Workshops
Professional Development	Basic Energy Workshops for K-12 Educators
	Building Science Workshops for K-12 Educators
	Development of a Facility Management 4 year Degree Program
	Financial Analysis of Energy Efficiency Projects Workshops
	K-12 Teacher Advisory Board
	Learning to S.E.E. (Sell Efficiency Effectively) Workshops
	Making Efficiency Work in AOAO Settings Workshops
	Ninja (Energy Sales Professional) Networking Event
	Reframing Energy Efficiency as a High-Yield, Low-Risk Investment Workshops
	Saving Energy, Money & Maintenance Fees Workshop
	Selling Efficiency Effectively in the AOAO Market Workshops
	UC Site Visit and Training for UH Campuses
Technical Knowledge & Training	Air Handling Systems, Efficiency & Air Quality Workshop
	Beyond the Sticker Price: Life Cycle Costing Workshop for Restaurants
	Building Efficiency & Technology Update Workshop
	Building Operator Certification (BOC©) Workshops
	Certified Energy Manager (CEM), Energy Manager in Training (EMIT) Workshop
	Chillers and Cooling Towers Workshop
	Energy Efficiency Survey Workshop
	How to Manage your Business' Energy Costs Workshop
	Implementing Energy Efficiency Projects, Demand Response Workshop
	Motor Efficiency, VSD and Purchase Workshop
	Power Quality Workshop
	Surveying Your Kitchen: Boost Your Profits Through Energy Efficiency Workshops
	Unitary Air Conditioning & Efficiency Workshop
	Unitary Air Conditioning and Operations & Maintenance Workshop
	Water and Wastewater Training Workshop

Performance #5: Island Equity (Broad Participation)

Target: 80% of each County's contribution to the Public Benefits Fee

The Island Equity target is intended to promote the equitable participation in the Program among the counties. For PY14, "equitable" would achieve the goal that for every dollar contributed to the PBF, a dollar would be returned to its county of origin through rebates, incentives, trainings and other Program initiatives.

Table 5 lists the results of the PY14 contributions to the PBF by island and county.

Table 5
Contributions to PBF by Island

Island	Residential Program Investment	Business Program Investment	PBFA Investment	Target %
Hawaii Island	$ 3,138,162	$ 2,115,594	$ 5,253,756	13.1 %
Lanai	$ 63,361	$ 59,850	$ 123,211	0.3 %
Maui	$ 2,949,817	$ 2,239,689	$ 5,189,506	12.9 %
Molokai	$ 80,071	$ 60,038	$ 140,109	0.3 %
Oahu	$ 13,209,812	$ 16,210,070	$ 29,419,882	73.3 %
Totals	**$19,441,223**	**$ 20,685,241**	**$ 40,126,464**	**100.0%**
County	**Residential Program Investment**	**Business Program Investment**	**PBFA Investment**	**Target %**
Hawaii	$ 3,138,162	$ 2,115,594	$ 5,253,756	13.1 %
Maui	$ 3,093,249	$ 2,359,577	$ 5,452,826	13.6 %
Honolulu	$ 13,209,812	$ 16,210,070	$ 29,419,882	73.3 %
Totals	**$ 19,441,223**	**$ 20,685,241**	**$ 40,126,464**	**100.0%**

Performance Award for Achieving Targets

Under the PBFA Contract, Program Performance Awards are provided from a "performance pool" created through a holdback of $55,708 from each monthly invoice (prior to tax) for Leidos work performed. A total of $668,500 was withheld over the PY14, which equates to $700,000 once tax is applied. Leidos, as the PBFA, has the ability to earn the $700,000 by achieving 100% of the performance indicator targets, or a portion thereof based on the percentage of targets met. If the PBFA exceeds its targets, up to an additional $133,000 could be awarded.

The maximum performance award potential for PY14 is $833,000 as shown in **Table 6**.

Table 6
Potential Performance Awards

Indicator	Minimum	Target	Maximum	Weight	Target
First Year Energy Reduction	75% $183,750	100% $245,000	123.75% $303,188	35%	$245,000
Peak Demand Reduction	75% $26,250	100% $35,000	123.75% $43,313	5%	$35,000
TRB NPV of Utility Cost Avoidance	75% $210,000	100% $280,000	123.75% $346,500	40%	$280,000
Market Transformation	$48,750	100% $70,000	100% $70,000	10%	$70,000
Broad Participation "Island Equity"	-	100% $70,000	100% $70,000	10%	$70,000
If all indicator metrics meet this level:	**Minimum**	**Target**	**Maximum**		
Performance Award Potential is:	468,750	700,000	833,000		

Performance Award Claim Summary

The Program's Performance Award Claim for PY14, is $640,142.07 (including tax) or 91% of the Program's potential target performance awards.

The Program's Performance Award Claim Summary based on the Program's Net Savings Impacts (kWh, kW and TRB), Market Transformation and Island Equity results are contained in **Table 7**.

Table 7
Performance Claim Summary

Indicator	Target	Results	% of Target	Award Claim
First Year Energy Reduction (kWh)	134,816,230	116,583,217	86.48%	$211,865.35
Peak Demand Reduction (kW)	17,250	18,497	107.23%	$41,009.09
TRB NPV of Utility Cost Avoidance ($)	$ 160,739,919	$144,819,560	90.10%	$252,267.62
Market Transformation				
Behavior Modification	18,000 Participants	71,176	395.4%	$ 15,000.00
Professional Development	1,000 Participants	1,772	177.2%	$ 15,000.00
Technical 'Know-How'	250 Participants	584	233.6%	$ 15,000.00
Hawaii Energy Ally Program	200 Allies	226	113.0%	$ 5,000.00
Benchmarking	500 Sites	428	85.6%	$ 15,000.00
Codes & Standards	3 Items	2	Min	
Demand Response	3 Items	3	Min	
Smart Grid	3 Items	2	Min	
Electric Vehicle	3 Items	3	Min	
Island Equity			**Target Met?**	
Honolulu County	> 80%	92.9%	Yes	$ 70,000.00
Hawaii County	> 80%	133.7%	Yes	
Maui County	> 80%	106.1%	Yes	
Performance Award Claim				**$640,142.07**

Cumulative Annual Electric Energy Savings (Program-Level) Award Claim: $211,865.35

The Program Energy Reduction was 116,583,217 kWh, which was 86% of the target of 134,816,230 kWh in the award claim of $211,865.35. This award is calculated from $183,750 for meeting the minimum level and $28,115.35 for the remaining savings of 15,471,045 kWh awarded at a rate of $0.001817/kWh achieved beyond the minimum.

See calculations in **Table 8** for details.

Table 8
Energy Reduction Award Claim Summary

Cumulative Annual Electric Energy Savings	**Minimum**		**Target**	**Maximum**			
Energy Award Potential	$183,750.00		$245,000.00	$303,188.00			
	75%		100%	123.75%			
Energy Reduction Goals (kWh)	101,112,173		134,816,230	148,297,853			
	75%		100%	110%			
Incentive Calculation	**Meet Minimum**		**Target – Minimum**	**Maximum – Target**		**Total**	
Pool Award Potential	$183,750.00		$61,250.00	$58,188.00		$303,188.00	Max
Energy Goal Pools (kWh)	101,112,173	÷	33,704,058	13,481,623	/kWh	148,297,853	kWh
Award Amount / Rate ($/kWh)	$183,750.00		0.001817	0.004316			
Energy Achievement (kWh)	101,112,173		15,471,045	-		116,583,217	kWh
Award Amount / Rate ($/kWh)	$183,750.00	x	0.001817	0.004316	/MWh		
Energy Achievement Award Calculation	$183,750.00		$28,115.35	-		$211,865.35	Calculated
						$211,865.35	**Award Claim**

Peak Demand Savings Award Claim: $41,009.09

The Combined Peak Demand Reduction was 18,497 kW, which was 107% of the target savings level resulting in an award claim of $41,009.09. This award is calculated from $26,250 for meeting the minimum level, $8,750 for meeting the target, and $6,009.09 for the remaining savings of 1,247 kW. Levels are awarded at a rate of $2.03/kW achieved for the first two levels, and $4.82/kW for demand reduction beyond the target.

See calculations in **Table 9** for details.

Table 9
Demand Reduction Award Claim Summary

Combined Annual Electric Demand Savings	**Minimum**	**Target**	**Maximum**
Demand Reduction Award Potential	$ 26,250.00	$ 35,000.00	$ 43,312.50
	75%	100%	123.75%
Demand Reduction Goals (kW)	12,938	17,250	18,975
	75%	100%	110%

Incentive Calculation	**Meet Minimum**		**Target – Minimum**	**Maximum – Target**		**Total**	
Pool Award Potential	$ 26,250.00		$ 8,750.00	$ 8,312.50		$ 43,312.50	Max
Demand Goal Pools (kW)	12,938	÷	4,313	1,725		18,975	kW
Award Amount / Rate ($/kW)	$2.029		$ 2.029	$ 4.819	/kW		
Demand Savings Achievement (kW)	12,938		4,313	1,247		18,497	kW
Award Amount / Rate ($/kW)	$2.029	x	$ 2.029	$ 4.819	/kW		
Demand Savings Achievement Award Calculation	$ 26,250.00		$ 8,750	$ 6,009.09		$ 41,009.09	Calculated
						$ 41,009.09	**Award Claim**

Total Resource Benefit (TRB) Award Claim: $252,267.62

The TRB achievement of $144,819,560 NPV is 90.1% of the target amount between the minimum and target level. This award claim of $252,267.62 is calculated from $210,000 for meeting the minimum level and $42,267.62 for the remaining 15.096% awarded at a rate of $2,800/percent achieved beyond the minimum level.

See calculations in **Table 10** for details.

Table 10
TRB Award Claim Calculation

TRB Target Metrics	Minimum	Target	Maximum			
TRB Award Potential	$ 210,000	$ 280,000	$ 346,500			
TRB Goal Pools in Metrics	75%	100%	123.75%			
TRB Goals	$ 120,554,939	$ 160,739,919	$ 176,813,911		NPV of Utility Benefits	
	75%	100%	110%			
Incentive Calculation	**Meet Minimum**	**Target – Minimum**	**Maximum – Target**		**Total**	
Pool Award Potential	**$ 210,000**	**$ 70,000**	**$ 66,500**		**$ 346,500**	**Max**
TRB Goal Pools in Metrics	75%	25%	23.75%		123.75%	
Award Amount / Rate ($/%)	$ 2,800	$ 2,800	$ 2,800	/%		
TRB Achievement					$ 144,819,560.00	
TRB Goals					$ 160,739,919	
TRB Savings Achievement	75%	15.1%	-		90.10%	
Award Amount / Rate ($/%)	$ 2,800	$ 2,800	$ 2,800	/%		
TRB Energy Achievement Award Calculation	$ 210,000	$ 42,267.62	-		$ 252,267.62	Calculated
					$252,267.62	**Award Claim**

Market Transformation Award Claim: $65,000.00

The Market Transformation claim of $65,000.00 is based on exceeding the target of two Annual Plan Transformational Tasks: Behavior Modification and Professional Development. See **Table 11** for details.

Table 11
Market Transformation Award Claim Calculation

Category	Minimum	Minimum Award	Target	Target Award	Achievement	Award Level	Award Claim
Behavior Modification	12,600 Participants	$ 11,250	18,000 Participants	$ 15,000	71,176 Participants	Target	$ 15,000
Professional Development	700 Participants	$ 11,250	1,000 Participants	$ 15,000	1,828 Participants	Target	$ 15,000
Technical 'Know-How'	175 Participants	$ 11,250	250 Participants	$ 15,000	584 Participants	Target	$ 15,000
Hawaii Energy Ally Program	-	-	200 Allies	$ 5,000	226 Allies	Target	$ 5,000
Benchmarking	200 Sites		500 Sites		428 Sites	Minimum	
Codes & Standards	2 Items		3 Items		2 Items	Minimum	
Demand Response	2 Items	$ 15,000	3 Items	$ 20,000	4 Items	Target	$ 15,000
Smart Grid	2 Items		3 Items		3 Items	Target	
Electric Vehicle	2 Items		3 Items		4 Items	Target	
Total							**$ 65,000**

Island Equity (Broad Participation) Award Claim: $70,000.00

The Program achieved the targeted percentages of Island Equity this performance period.

See calculations in **Table 12** for details.

Table 12
Island Equity Award Claim Calculation

County	PY14 PBF Contribution	PBF Contribution %	Target	PY14 Total Incentives	% Accomplished	% of Target	Met Minimum	Award Claim
Honolulu	$ 29,419,882	73.3%	>80%	$ 15,130,505	68.1%	93%	Yes	
Hawaii	$ 5,253,756	13.1%	>80%	$ 3,890,204	17.5%	134%	Yes	
Maui	$ 5,452,826	13.6%	>80%	$ 3,203,528	14.4%	106%	Yes	
Total	**$ 40,126,464**	**100.0%**		**$ 22,224,237**	**100.0%**		**Yes**	**$ 70,000**
								$ 70,000

Table 12a
Incentives and Transformational Spent vs. Budget $

County	Program Incentives	Transformational Incentives	Total Incentives Budgeted	Total Accomplished	% of Budget
Honolulu	$15,228,916	$2,036,942	$20,864,420	$ 17,265,858	82.8%
Hawaii	$3,832,366	$799,787	$3,728,839	$ 4,632,153	124.2%
Maui	$3,162,955	$838,251	$3,871,161	$ 4,001,207	103.4%
Total	**$22,224,237**	**$3,674,980**	**$28,464,420**	**$25,899,218**	**91.0%**

BUDGET PROGRESSION & EXPENDITURES

PY14 Annual Plan Budget

Pursuant to the Program's approved PY14 Annual Plan dated June 10, 2015, the Program's initial budget for the program year was $39.5M, comprised of $24.5M in Incentives, $11.1M in Non-Incentives, and $3.9M in Transformational Incentives. As detailed in **Table 13** approximately 45% of the budget was allocated to Residential Programs and 55% to Business Programs, consistent with the prior program year.

Table 13
PY14 Annual Plan Budget

Activity	Non-Incentive	Incentive	Total
Residential Programs			
REEM	$2,225,000	$8,712,683	$10,937,683
CESH	$230,000	$977,542	$1,207,542
RESM	$100,000	$310,000	$410,000
RHTR	$300,000	$1,061,250	$1,361,250
Total Residential Programs	**$2,855,000**	**$11,061,475**	**$13,916,475**
Residential Market Evaluation	$219,561	0	$219,561
Residential Outreach	$600,000	0	$600,000
Total Residential Services and Initiatives	**$3,674,561**	**$11,061,475**	**$14,736,036**
Business Programs			
BEEM	$1,100,000	$4,809,550	$5,909,550
CBEEM	$1,100,000	$3,025,011	$4,125,011
BESM	$675,000	$2,437,500	$3,112,500
BHTR	$666,130	$3,247,520	$3,913,650
Total Business Programs	**$3,541,130**	**$13,519,581**	**$17,060,711**
Business Market Evaluation	$250,000	0	$250,000
Business Outreach	$700,000	0	$700,000
Total Business Services and Initiatives	**$4,491,130**	**$13,519,581**	**$18,010,711**
Total Residential and Business Services and Initiatives	**$8,165,691**	**$24,581,056**	**$32,746,747**
Transformational Programs			
Residential Transformational Programs	0	$1,747,514	$1,747,514
Business Transformational Programs	0	$2,135,850	$2,135,850
Total Transformation Services and Initiatives	**0**	**$3,883,364**	**$3,883,364**
Total Supporting Services	**$2,405,683**	**0**	**$2,405,683**
Total Tax on Non-Incentive	**$498,123**	**0**	**$498,123**
Estimated Contractor Costs	**$11,069,497**	**$28,464,420**	**$39,533,917**

Budget Transfers

In PY14 the program was given discretion to transfer funds within certain areas without a formal contractual request, consistent with guidance provided in PY13. Funds were allowed to be moved within each of the Operations and Management areas (Residential and Business) and within each of the Incentive areas (Residential and Business). During the course of PY14, there were four internal budget transfers to meet changing operational needs. Specifics of the internal transfers are detailed in **Table 14** and described below.

Internal Budget Transfers

The transfers were as follows:

- **March 2015** – Transferred Business Incentive funds as follows: FROM BEEM ($650,000), BESM ($1,330,000), and BHTR ($857,250); TO CBEEM ($2,837,250).
- **May 2015** - Transferred Residential Operations and Management funds as follows: FROM CESH ($175,000), RESM ($45,000), and Residential Evaluation ($40,000); TO REEM ($85,000), RHTR ($100,000), and Residential Outreach ($75,000). Transferred Business Operations and Management funds as follows: FROM - BESM ($150,000) and BHTR ($50,000); TO BEEM ($60,000), CBEEM ($120,000), and Business Outreach ($20,000).
- **May 2015** - Transferred Residential Incentive funds as follows: FROM CESH ($700,000); TO REEM ($600,000) and RESM ($100,000).
- **August 2015** – Transferred Residential Operations and Management funds as follows: FROM CESH ($2,000), RESM ($6,000), and Residential Evaluation ($16,000); TO REEM ($16,000) and RHTR ($8,000).

Table 14 Budget Progression 7/1/14-6/30/15								
	PY14 Annual Plan Budget	Bus Inc Transfer (3/2015)	PY14 Budget as of 3/2015	Incentive Transfers (5/2015)	O&M Transfers (5/2015)	PY14 Budget as of 5/2015	O&M Transfers (8/2015)	PY14 Budget as of 8/2015
Residential Programs								
Operations & Management								
REEM	2,225,000		2,225,000		85,000	2,310,000	16,000	2,326,000
CESH	230,000		230,000		(175,000)	55,000	(2,000)	53,000
RESM	100,000		100,000		(45,000)	55,000	(6,000)	49,000
RHTR	300,000		300,000		100,000	400,000	8,000	408,000
Total Residential Programs	2,855,000		2,855,000		(35,000)	2,820,000	16,000	(19,000)
Residential Market Evaluation	219,561		219,561		(40,000)	179,561	(16,000)	163,561
Residential Outreach	600,000		600,000		75,000	675,000	-	675,000
Total Residential Ops & Management	3,674,561		3,674,561		-	3,674,561	-	3,674,561
Residential Incentives								
REEM	8,712,683		8,712,683	600,000		9,312,683		9,312,683
CESH	977,542		977,542	(700,000)		277,542		277,542
RESM	310,000		310,000	100,000		410,000		410,000
RHTR	1,061,250		1,061,250			1,061,250		1,061,250
Subtotal Residential Incentives	11,061,475		11,061,475			11,061,475		11,061,475
Residential Transformational	1,747,514		1,747,514			1,747,514		1,747,514
Total Residential Incentives	12,808,989		12,808,989			12,808,989		12,808,989
Total Residential Programs	**16,483,550**		**16,483,550**			**16,483,550**		**16,483,550**
Business (C&I) Programs								
Operations & Management								
BEEM	1,100,000		1,100,000		60,000	1,160,000		1,160,000
CBEEM	1,100,000		1,100,000		120,000	1,220,000		1,220,000
BESM	675,000		675,000		(150,000)	525,000		525,000
BHTR	666,130		666,130		(50,000)	616,130		616,130
Total Business Programs	3,541,130		3,541,130		(20,000)	3,521,130		3,521,130
Business Market Evaluation	250,000		250,000			250,000		250,000
Business Outreach	700,000		700,000		20,000	720,000		720,000
Total Business Ops & Management	4,491,130		4,491,130		-	4,491,130		4,491,130
Business Incentives			-					-
BEEM	4,809,550	(650,000)	4,159,550			4,159,550		4,159,550
CBEEM	3,025,011	2,837,250	5,862,261			5,862,261		5,862,261
BESM	2,437,500	(1,330,000)	1,107,500			1,107,500		1,107,500
BHTR	3,247,520	(857,250)	2,390,270			2,390,270		2,390,270
Subtotal Business Incentives	13,519,581	-	13,519,581			13,519,581		13,519,581
Business Transformational	2,135,850		2,135,850			2,135,850		2,135,850
Total Business Incentives	15,655,431		15,655,431			15,655,431		15,655,431
Total Business Programs	**20,146,561**		**20,146,561**			**20,146,561**		**20,146,561**

Table 14 (con't) Budget Progression 7/1/14-6/30/15								
	PY14 Annual Plan Budget	Bus Inc Transfer (3/2015)	PY14 Budget as of 3/2015	Incentive Transfers (5/2015)	O&M Transfers (5/2015)	PY14 Budget as of 5/2015	O&M Transfers (8/2015)	PY14 Budget as of 8/2015
Supporting Services								
Supporting Services	2,405,683		2,405,683			2,405,683		2,405,683
Total Supporting Services	**2,405,683**		**2,405,683**			**2,405,683**		**2,405,683**
Subtotal Non-Incentive (Prior to Tax)	10,571,374		10,571,374			10,571,374		10,571,374
Less Performance Incentives (Prior to Tax)	(668,500)		(668,500)			(668,500)		(668,500)
Subtotal Non-Incentive Less Performance Incentives (PI)	9,902,874		9,902,874			9,902,874		9,902,874
Total Tax on Non-Incentive Without PI	466,623		466,623			466,623		466,623
Performance Incentive Award (Inclusive of Tax)	700,000		700,000			700,000		700,000
Subtotal Non-Incentives	***11,069,497***		***11,069,497***			***11,069,497***		***11,069,497***
Subtotal Residential and Business Customer Incentives	***24,581,056***		***24,581,056***			***24,581,056***		***24,581,056***
Subtotal Transformational Incentives	***3,883,364***		***3,883,364***			***3,883,364***		***3,883,364***
Sub-Total Estimated Contractor Costs	***39,533,917***		***39,533,917***			***39,533,917***		***39,533,917***
Performance Awards in Excess of Target Levels	133,000		133,000			133,000		133,000
Total Estimated Contractor Costs, including Performance Awards in Excess of Target Levels	**39,666,917**		**-** **39,666,917**			**39,666,917**		**39,666,917**

Portfolio Expenditures

Throughout the year, the Program reviewed operational needs and leveraged funding to drive program value. At year-end, the Program had utilized 90% of budgeted Incentives, 98% of budgeted Non-Incentives (prior to holdback amounts), and 95% of budgeted Transformational Incentives. Details of final PY14 expenditures and unspent funds by program categories are shown in **Table 15**. Specific discussions related to each Residential and Business program are provided within those respective sections.

Table 15
Program Expenditures and Unspent Funds

	Total Expenditures	PY14 Budget	Percent Spent	Unspent	Percent Unspent
Residential Programs					
Operations and Management					
REEM	$ 2,325,000.47	$ 2,326,000.00	99.96%	$ 999.53	0.04%
CESH	$ 52,086.66	$ 53,000.00	98.28%	$ 913.34	1.72%
RESM	$ 48,953.55	$ 49,000.00	99.91%	$ 46.45	0.09%
RHTR	$ 407,446.45	$ 408,000.00	99.86%	$ 553.55	0.14%
Total Residential Programs	$ 2,833,487.13	$ 2,836,000.00	99.91%	$ 2,512.87	0.09%
Residential Evaluation	$ 160,747.08	$ 163,561.00	98.28%	$ 2,813.92	1.72%
Residential Outreach	$ 670,442.17	$ 675,000.00	99.32%	$ 4,557.83	0.68%
Total Residential Non-Incentives	$ 3,664,676.38	$ 3,674,561.00	99.73%	$ 9,884.62	0.27%
Residential Incentives					
REEM	$ 9,011,160.99	$ 9,312,683.00	96.76%	$ 301,522.01	3.24%
CESH	$ 1,319.08	$ 277,542.00	0.48%	$ 276,222.92	99.52%
RESM	$ 301,350.00	$ 410,000.00	73.50%	$ 108,650.00	26.50%
RHTR	$ 664,296.93	$ 1,061,250.00	62.60%	$ 396,953.07	37.40%
Subtotal Residential Incentives	$ 9,978,127.00	$ 11,061,475.00	90.21%	$ 1,083,348.00	9.79%
Residential Transformational	$ 1,684,719.01	$ 1,747,514.00	96.41%	$ 62,794.99	3.59%
Total Residential Incentives	$ 11,662,846.01	$ 12,808,989.00	91.05%	$ 1,146,142.99	8.95%
Total Residential Programs	**$ 15,327,522.39**	**$ 16,483,550.00**	**92.99%**	**$ 1,156,027.61**	**7.01%**
Business (C&I) Programs					
Operations and Management					
BEEM	$ 1,145,534.76	$ 1,160,000.00	98.75%	$ 14,465.24	1.25%
CBEEM	$ 1,183,445.15	$ 1,220,000.00	97.00%	$ 36,554.85	3.00%
BESM	$ 498,397.56	$ 525,000.00	94.93%	$ 26,602.44	5.07%
BHTR	$ 610,986.36	$ 616,130.00	99.17%	$ 5,143.64	0.83%
Total Business Programs	$ 3,438,363.83	$ 3,521,130.00	97.65%	$ 82,766.17	2.35%
Business Evaluation	$ 210,430.20	$ 250,000.00	84.17%	$ 39,569.80	15.83%
Business Outreach	$ 678,511.44	$ 720,000.00	94.24%	$ 41,488.56	5.76%
Total Business Non-Incentives	$ 4,327,305.47	$ 4,491,130.00	96.35%	$ 163,824.53	3.65%

Table 15 Program Expenditures and Unspent Funds (cont'd)					
	Total Expenditures	**PY14 Budget**	**Percent Spent**	**Unspent**	**Percent Unspent**
Business Incentives					
BEEM	$ 3,586,527.04	$ 4,159,550.00	86.22%	$ 573,022.96	13.78%
CBEEM	$ 5,557,198.04	$ 5,862,261.00	94.80%	$ 305,062.96	5.20%
BESM	$ 886,665.49	$ 1,107,500.00	80.06%	$ 220,834.51	19.94%
BHTR	$ 2,215,719.66	$ 2,390,270.00	92.70%	$ 174,550.34	7.30%
Subtotal Business Incentives	$ 12,246,110.23	$ 13,519,581.00	90.58%	$ 1,273,470.77	9.42%
Business Transformational	$ 1,990,261.28	$ 2,135,850.00	93.18%	$ 145,588.72	6.82%
Total Business Incentives	$ 14,236,371.51	$ 15,655,431.00	90.94%	$ 1,419,059.49	9.06%
Total Business Programs	**$ 18,563,676.98**	**$ 20,146,561.00**	**92.14%**	**$ 1,582,884.02**	**7.86%**
Total Services and Initiatives	**$ 33,891,199.37**	**$ 36,630,111.00**	**92.52%**	**$ 2,738,911.63**	**7.48%**
Supporting Services					
Supporting Services	$ 2,351,388.19	$ 2,405,683.00	97.74%	$ 54,294.81	2.26%
Total Supporting Services	**$ 2,351,388.19**	**$ 2,405,683.00**	**97.74%**	**$ 54,294.81**	**2.26%**
Subtotal Non-Incentives (Prior to Tax)	$ 10,343,370.04	$ 10,571,374.00	97.84%	$ 228,003.96	2.16%
Less Performance Incentives (Prior to Tax)	$ (668,500.32)	$ (668,500.00)	100.00%	$ 0.32	0.00%
Subtotal Non-Incentive Less Performance Incentives (PI)	$ 9,674,869.72	$ 9,902,874.00	97.70%	$ 228,004.28	2.30%
Total Tax on Non-Incentive Without PI	$ 455,879.86	$ 466,623.00	97.70%	$ 10,743.14	2.30%
Performance Incentive Award (Inclusive of Tax)	$ -	$ 700,000.00	0.00%	$ 700,000.00	100.00%
Subtotal Non-Incentives Billed	*$ 10,130,749.58*	*$ 11,069,497.00*	91.52%	$ 938,747.42	8.48%
Subtotal Residential and Business Customer Incentives	*$ 22,224,237.23*	*$ 24,581,056.00*	90.41%	$ 2,356,818.77	9.59%
Subtotal Transformational Incentives	*$ 3,674,980.29*	*$ 3,883,364.00*	94.63%	$ 208,383.71	5.37%
Subtotal Customer and Transformational incentives	*$ 25,899,217.52*	*$ 28,464,420.00*	90.99%	$ 2,565,202.48	9.01%
Sub-Total Estimated Contractor Costs	***$ 36,029,967.10***	***$ 39,533,917.00***	**91.14%**	**$ 3,503,949.90**	**8.86%**
Performance Awards in Excess of Target Levels		$ 133,000.00			
Total Estimated Contractor Costs, including Performance Awards in Excess of Target Levels		**$ 39,666,917.00**			

Bill $aver Program (On-Bill Financing and On-Bill Repayment Options)

In PY14, the Program contract included funding for the Bill $aver Program, comprised of the On-Bill Financing (OBF) and On-Bill Repayment (OBR) options. The budget and deliverables for these options were described in the Bill Saver Program proposal attached to Supplemental Contract No. 6. Bill $aver Program budgets and PY14 expenditures are detailed in **Table 16**. Although numerous Bill $aver deliverables were developed in PY14, delays outside of program control resulted in program launch being delayed (new launch date is currently pending). As a result, at year-end, the Bill $aver Program had utilized 18% of its allotted funds. A more detailed discussion on the Bill $aver Program can be found in the Program Overview.

Table 16
Program Expenditures and Unspent Funds

	Total Expenditures	PY14 Budget	Percent Spent	Unspent	Percent Unspent
Block 1 - Ongoing OBF Program Administration					
Contractor Training, Management & Operations	$264,561.49	$308,794.00	85.68%	$44,232.51	14.32%
IT Tool Development	$76,952.49	$108,946.00	70.63%	$31,993.51	29.37%
Marketing & Outreach1	$3,660.00	$84,997.00	4.31%	$81,337.00	95.69%
Program Management / Admin	$6,130.00	$12,867.00	47.64%	$6,737.00	52.36%
Total Block 1 - Ongoing OBF Program Administration	**$351,303.98**	**$515,604.00**	**68.13%**	**$164,300.02**	**31.87%**
Block 2 - OBF Additional Program Development					
Program Development	$0.00	$116,966.00	0.00%	$116,966.00	100.00%
IT Tool Development	$0.00	$73,379.00	0.00%	$73,379.00	100.00%
Total Block 2 - OBF Additional Program Development	**$0.00**	**$190,345.00**	**0.00%**	**$190,345.00**	**100.00%**
Block 3 - GEMS/OBR Program Development & Administration					
Program Development	$30,162.50	$278,972.00	10.81%	$248,809.50	89.19%
Contractor Training, Management & Operations	$0.00	$464,255.00	0.00%	$464,255.00	100.00%
IT Tool Development	$13,440.00	$247,174.00	5.44%	$233,734.00	94.56%
Marketing & Outreach	$0.00	$167,516.00	0.00%	$167,516.00	100.00%
Program Management/Admin	$0.00	$151,828.00	0.00%	$151,828.00	100.00%
Total Block 3 -GEMS/OBR Program Development & Administration	**$43,602.50**	**$1,309,745.00**	**3.33%**	**$1,266,142.50**	**96.67%**
Block 4 - KIUC Program Development, Integration & Administration					
Program Development	$0.00	$70,329.00	0.00%	$70,329.00	100.00%
Contractor Training, Management & Operations	$0.00	$46,486.00	0.00%	$46,486.00	100.00%
IT Tool Development	$0.00	$28,597.00	0.00%	$28,597.00	100.00%
Marketing & Outreach	$0.00	$28,611.00	0.00%	$28,611.00	100.00%
Program Management/Admin	$0.00	$30,657.00	0.00%	$30,657.00	100.00%
Total Block 4 - KIUC Program Development, Integration & Administration	**$0.00**	**$204,680.00**	**0.00%**	**$204,680.00**	**100.00%**
Subtotal Block 1 - Ongoing OBF Program Administration	*$351,303.98*	*$515,604.00*	*68.13%*	*$164,300.02*	*31.87%*
Subtotal Block 2 - OBF Additional Program Development	*$0.00*	*$190,345.00*	*0.00%*	*$190,345.00*	*100.00%*
Subtotal Block 3 - GEMS/OBR Program Development & Administration	*$43,602.50*	*$1,309,745.00*	*3.33%*	*$1,266,142.50*	*96.67%*
Subtotal Block 4 - KIUC Program Development, Integration & Administration	*$0.00*	*$204,680.00*	*0.00%*	*$204,680.00*	*100.00%*
OBF Program Total (prior to tax)	***$394,906.48***	***$2,220,374.00***	***17.79%***	***$1,825,467.52***	***82.21%***
Total Tax on OBF program	$18,607.98	$104,624.00	*17.79%*	*$86,016.02*	*82.21%*
OBF Program Total (inclusive of tax)	**$413,514.46**	**$2,324,998.00**	***17.79%***	***$1,911,483.54***	***82.21%***

PORTFOLIO IMPACTS

Introduction

There are three levels of energy and demand savings shown in this Report. The three levels are used to show how energy and demand savings are credited at the customer's meter (Customer Level Savings), at the utility system generation level (System Level Savings) and at the PBFA Contract level (Program Level Savings).

1. **Customer Level Savings (Gross at Meter)** – This savings figure is the gross change in energy consumption at the customer meter that results directly from Program-promoted actions taken by Program participants. The savings are determined by direct metering, engineering calculations, or measurement and verification of prior installations of the particular savings measure. This is the savings level defined in the Program's Technical Resource Manual (TRM).

2. **System Level Savings (Gross Generated)** – This savings figure is realized at the utility system level and includes the transmission, distribution and generation station energy losses between the end-use customer and the utility generating units. System Level Savings has been termed Gross Level Savings in previous reports.

3. **Program Level Savings (Net Generated)** – This savings figure shows the amount of energy reductions determined to be directly attributed to PBFA Program actions by separating out the impacts that are a result of other influences, such as consumer self-motivation or free-riders. Free-riders are ratepayers or participants who received an incentive and/or education from the Program, but the incentive and/or education did not play a role in their decision to purchase the savings measure. These ratepayers would have taken action or purchased the energy-efficient item regardless of the incentive and therefore, Program Level Savings removes their participation.

Portfolio Energy and Demand Savings

Program Energy Savings for PY14 were:

- **First Year** – 116,583,217 kWh
  (53.2% in Residential and 46.8% in Business programs)

- **Lifetime** – 1,191,771,572 kWh
  (41.9% in Residential and 58.1% for Business programs)

The difference in percentage contributions between first year and lifetime savings remains due to the relative weight of CFLs and the Peer Group Comparison in the residential portfolio. These measures have relatively short measure lives (six years and one year, respectively) as compared to longer lived measures in the business portfolio this year, bolstered by the LEDs having 15 year measure lives. Residential measures have an average measure life of 8.0 years in PY14 up from 7.8 years in PY13, while business measures have an average measure life of 12.6 years in PY14 down from 14.6 years in PY13.

Program Peak Demand reduction for PY14 was:

- **Peak Demand** – 18,497 kW (54.5% from Residential and 45.5% from Business)

The following tables provide a summary of the Residential and Business programs in the context of their level of activity, incentives, energy-saving impacts and cost effectiveness at the Program, System and Customer levels.

- **Table 17:** Cumulative Annual Electric Energy Savings (Program Level) by Budget Category

- **Table 18:** Cumulative Annual Electric Energy Savings (System Level) by Budget Category

- **Table 19:** Cumulative Annual Electric Energy Savings (Customer Level) by Budget Category

Table 17 Cumulative Annual Electric Savings (Program Level) by Budget Category								
Program	**Apps Processed**	**Quantity of Energy Efficient Equipment (Units)**	**Incentives ($)**	**Demand Impact (kW)**	**First Year Energy Impact (kWh 1st Yr)**	**Lifetime Energy Impact (kWh - Life)**	**First Year Impact Cost ($/kWh)**	**Lifetime Impact Cost ($/kWh)**
BEEM	1,752	88,071	$ 3,586,527	3,821	22,154,603	308,911,319	$ 0.162	$ 0.012
CBEEM	404	60,199	$ 5,557,198	3,481	25,366,309	293,171,679	$ 0.219	$ 0.019
BHTR	813	33,336	$ 2,208,570	1,112	6,849,420	89,446,256	$ 0.322	$ 0.025
BESM	22	68	$ 893,815	0	241,023	1,205,115	$ 3.708	$ 0.742
Business Totals	**2,991**	**181,674**	**$ 12,246,110**	**8,414**	**54,611,354**	**692,734,369**	**$ 0.224**	**$ 0.018**
REEM	15,093	3,358,298	$ 9,011,161	9,874	60,733,605	489,452,081	$ 0.148	$ 0.018
RESM	1,700	1,775	$ 301,350	50	631,896	5,169,866	$ 0.477	$ 0.058
RHTR	1,212	21,200	$ 664,297	159	606,361	4,415,256	$ 1.096	$ 0.150
CESH	1	1	$ 1,319	0	0	0	$ 0	$ 0
Residential Totals	**18,006**	**3,381,274**	**$ 9,978,127**	**10,083**	**61,971,862**	**499,037,203**	**$ 0.161**	**$ 0.020**
Total	**20,997**	**3,562,948**	**$ 22,224,237**	**18,497**	**116,583,217**	**1,191,771,572**	**$ 0.191**	**$ 0.019**

Program	**Total Resource Benefit (TRB)**	**Total Resource Cost (TRC)**	**Driven Benefit Ratio (TRB/Incentive $)**	**Driven Investment Ratio (TRC/Incentive $)**	**Benefit Test (TRB/TRC)**
BEEM	$ 36,751,925	$ 8,958,967	10.2	2.5	4.1
CBEEM	$ 33,797,316	$ 32,943,863	6.1	5.9	1.0
BHTR	$ 10,424,522	$ 2,143,255	4.7	1.0	4.9
BESM	$ 113,582	$ 1,043,250	0.1	1.2	0.1
Business Totals	**$ 81,087,345**	**$ 45,089,335**	**6.6**	**3.7**	**1.8**
REEM	$ 62,521,017	$ 23,034,782	6.9	2.6	2.7
RESM	$ 512,543	$ 555,900	1.7	1.8	0.9
RHTR	$ 699,700	$ 661,866	1.1	1.0	1.1
CESH	$ 0	$ 1,319	0.0	1.0	0.0
Residential Totals	**$ 63,733,260**	**$ 24,253,867**	**6.4**	**2.4**	**2.6**
Total	**$ 144,820,605**	**$ 69,343,202**	**6.5**	**3.1**	**2.1**

Table 18 Cumulative Annual Electric Savings (System Level) by Budget Category								
Program	**Apps Processed**	**Quantity of Energy Efficient Equipment (Units)**	**Incentives**	**Demand Impact (kW)**	**First Year Energy Impact (kWh 1st Yr)**	**Lifetime Energy Impact (kWh - Life)**	**First Year Impact Cost ($/kWh)**	**Lifetime Impact Cost ($/kWh)**
BEEM	1,752	88,071	$ 3,586,527	5,080	29,424,752	410,964,014	$ 0.122	$ 0.009
CBEEM	404	60,199	$ 5,557,198	4,641	33,821,745	390,895,572	$ 0.164	$ 0.014
BHTR	813	33,336	$ 2,208,570	1,228	7,149,996	91,506,705	$ 0.309	$ 0.024
BESM	22	68	$ 893,815	0	253,708	1,268,542	$ 3.523	$ 0.705
Business Totals	**2,991**	**181,674**	**$ 12,246,110**	**10,950**	**70,650,202**	**894,634,833**	**$ 0.173**	**$ 0.014**
REEM	15,093	3,358,298	$ 9,011,161	12,498	76,878,053	619,560,787	$ 0.117	$ 0.015
RHTR	1,212	21,200	$ 664,297	215	819,171	5,878,144	$ 0.811	$ 0.113
RESM	1,700	1,775	$ 301,350	55	686,844	5,619,420	$ 0.439	$ 0.054
CESH	1	1	$ 1,319	0	0	0	$ 0	$ 0
Residential Totals	**18,006**	**3,381,274**	**$ 9,978,127**	**12,768**	**78,384,068**	**631,058,350**	**$ 0.127**	**$ 0.016**
Total	**20,997**	**3,562,948**	**$ 22,224,237**	**23,718**	**149,034,270**	**1,525,693,183**	**$ 0.149**	**$ 0.015**

Program	**Total Resource Benefit (TRB)**	**Total Resource Cost (TRC)**	**Driven Benefit Ratio (TRB/Incentive $)**	**Driven Investment Ratio (TRC/Incentive $)**	**Benefit Test (TRB/TRC)**
BEEM	$ 48,886,487	$ 8,958,967	13.6	2.5	5.5
CBEEM	$ 45,063,003	$ 32,943,863	8.1	5.9	1.4
BHTR	$ 10,802,709	$ 2,143,255	4.9	1.0	5.0
BESM	$ 119,560	$ 1,043,250	0.1	1.2	0.1
Business Totals	**$ 104,871,759**	**$ 45,089,335**	**8.6**	**3.7**	**2.3**
REEM	$ 79,129,136	$ 23,034,782	8.8	2.6	3.4
RHTR	$ 935,493	$ 661,866	1.4	1.0	1.4
RESM	$ 556,484	$ 555,900	1.8	1.8	1.0
CESH	$ 0	$ 1,319	0.0	1.0	0.0
Residential Totals	**$ 80,621,113**	**$ 24,253,867**	**8.1**	**2.4**	**3.3**
Total	**$ 185,492,872**	**$ 69,343,202**	**8.3**	**3.1**	**2.7**

Table 19 Cumulative Annual Electric Savings (Customer Level) by Budget Category								
Program	**Apps Processed**	**Quantity of Energy Efficient Equipment (Units)**	**Incentives**	**Demand Impact (kW)**	**First Year Energy Impact (kWh 1st Yr)**	**Lifetime Energy Impact (kWh - Life)**	**First Year Impact Cost ($/kWh)**	**Lifetime Impact Cost ($/kWh)**
BEEM	1,752	88,071	$ 3,586,527	4,584	26,567,178	370,995,257	$ 0.135	$ 0.010
CBEEM	404	60,199	$ 5,557,198	4,184	30,491,162	352,355,152	$ 0.182	$ 0.016
BHTR	813	33,336	$ 2,208,570	1,109	6,459,676	82,688,438	$ 0.342	$ 0.027
BESM	22	68	$ 893,815	0	232,760	1,163,800	$ 3.840	$ 0.768
Business Totals	**2,991**	**181,674**	**$ 12,246,110**	**9,877**	**63,750,776**	**807,202,647**	**$ 0.192**	**$ 0.015**
REEM	15,093	3,358,298	$ 9,011,161	11,297	69,486,595	559,990,086	$ 0.130	$ 0.016
RHTR	1,212	21,200	$ 664,297	194	739,754	5,328,818	$ 0.898	$ 0.125
RESM	1,700	1,775	$ 301,350	49	619,117	5,061,225	$ 0.487	$ 0.060
CESH	1	1	$ 1,319	0	0	0	$ 0	$ 0
Residential Totals	**18,006**	**3,381,274**	**$ 9,978,127**	**11,541**	**70,845,465**	**570,380,130**	**$ 0.141**	**$ 0.017**
Total	**20,997**	**3,562,948**	**$ 22,224,237**	**21,418**	**134,596,241**	**1,377,582,777**	**$ 0.165**	**$ 0.016**

Program	**Total Resource Benefit (TRB)**	**Total Resource Cost (TRC)**	**Driven Benefit Ratio (TRB/Incentive $)**	**Driven Investment Ratio (TRC/Incentive $)**	**Benefit Test (TRB/TRC)**
BEEM	$ 44,123,697	$ 8,958,967	12.3	2.5	4.9
CBEEM	$ 40,619,487	$ 32,943,863	7.3	5.9	1.2
BHTR	$ 9,759,765	$ 2,143,255	4.4	1.0	4.6
BESM	$ 109,687	$ 1,043,250	0.1	1.2	0.1
Business Totals	**$ 94,612,637**	**$ 45,089,335**	**7.7**	**3.7**	**2.1**
REEM	$ 71,494,332	$ 23,034,782	7.9	2.6	3.1
RHTR	$ 844,732	$ 661,866	1.3	1.0	1.3
RESM	$ 500,618	$ 555,900	1.7	1.8	0.9
CESH	$ 0	$ 1,319	0.0	1.0	0.0
Residential Totals	**$ 72,839,683**	**$ 24,253,867**	**7.3**	**2.4**	**3.0**
Total	**$ 167,452,320**	**$ 69,343,202**	**7.5**	**3.1**	**2.4**

See Attachment H for a chart comparing the Program's kWh benefits and cost effectiveness at the Program, Customer and System levels.

Savings at Customer and Program Levels

Program level savings translate from Program participants (customers) achieving first-year savings based upon the energy efficiency measures they purchased or otherwise installed.

First-year Customer Energy Savings was 134,596,241 kWh per year (1.5% of 2014 utility sale, **Table 33**), while Customer Peak Demand Savings was 21,418 kW (1.4% of 2014 utility sales). This does not reflect Peak Demand Savings for the customer as it may not coincide with their actual measured peak demand used for billing purposes. The utility reported non-coincident peak demand across all islands of 1,553,900 kW. (See **Tables 33-34** for further breakdown.) The following tables provide summaries of cumulative energy savings and peak demand savings in the context of program budget categories and island, specifically:

- **Table 20:** Energy (kWh) Reduction by Impact Level and by Island
- **Table 21:** Demand (kW) Reduction by Impact Level and by Island
- **Table 22:** Energy (kWh) Reduction by Impact Level and by Program
- **Table 23:** Demand (kW) Reduction by Impact Level and by Program

Table 20
Energy Impacts (kWh) by Impact Level and Island

Island	Customer Level Savings	System Losses	System Level Savings	Net-to-Gross Ratio	Program Level Savings
Hawaii Island	17,501,912	9.0%	19,077,084	79.5%	15,159,511
Lanai	73,138	9.6%	80,130	85.8%	68,776
Maui	17,700,427	10.0%	19,463,390	77.8%	15,144,594
Molokai	76,236	9.6%	83,524	78.4%	65,471
Oahu	99,244,529	11.2%	110,330,142	78.1%	86,144,864
Total	**134,596,241**	**10.7%**	**149,034,270**	**78.2%**	**116,583,217**
Percent of Customer Level Savings			111%		87%

Table 21
Demand Impacts (kW) by Impact Level and Island

Island	Customer Level Savings	System Losses	System Level Savings	Net-to-Gross Ratio	Program Level Savings
Hawaii Island	2,698	9.0%	2,940	79.2%	2,329
Lanai	14	9.6%	15	78.8%	12
Maui	2,771	10.0%	3,047	77.7%	2,368
Molokai	14	9.6%	15	78.5%	12
Oahu	15,922	11.2%	17,700	77.8%	13,776
Total	**21,418**	**10.7%**	**23,718**	**78.0%**	**18,497**
Percent of Customer Level Savings			111%		86%

Table 22 Energy Impacts (kWh) Impact Level and Program					
Program	**Customer Level Savings**	**System Losses**	**System Level Savings**	**Net-to-Gross Ratio**	**Program Level Savings**
BEEM	26,567,178	10.8%	29,424,752	75.3%	22,154,603
CBEEM	30,491,162	10.9%	33,821,745	75.0%	25,366,309
BESM	232,760	9.0%	253,708	95.0%	241,023
BHTR	6,459,676	10.7%	7,149,996	95.8%	6,849,420
Business Programs	63,750,776	10.8%	70,650,202	77.3%	54,611,354
REEM	69,486,595	10.6%	76,878,053	79.0%	60,733,605
CESH	0	0%	0	0%	0
RESM	619,117	10.9%	686,844	92.0%	631,896
RHTR	739,754	10.7%	819,171	74.0%	606,361
Residential Programs	70,845,465	10.6%	78,384,068	79.1%	61,971,862
Total	**134,596,241**	**10.7%**	**149,034,270**	**78.2%**	**116,583,217**
Percent of Customer Level Savings			111%		87%

Table 23 Demand Impacts (kW) by Impact Level and Program					
Program	**Customer Level Savings**	**System Losses**	**System Level Savings**	**Net-to-Gross Ratio**	**Program Level Savings**
BEEM	4,584	10.8%	5,080	75.2%	3,821
CBEEM	4,184	10.9%	4,641	75.0%	3,481
BESM	0	0%	0	0%	0
BHTR	1,109	10.7%	1,228	90.5%	1,112
Business Programs	9,877	10.9%	10,950	76.8%	8,414
REEM	11,297	10.6%	12,498	79.0%	9,874
CESH	0	0%	0	0%	0
RESM	49	10.8%	55	92.0%	50
RHTR	194	10.8%	215	73.9%	159
Residential Programs	11,541	10.6%	12,768	79.0%	10,083
Total	**21,418**	**10.7%**	**23,718**	**78.0%**	**18,497**
Percent of Customer Level Savings			111%		86%

CFLs & LEDs – Market Shift Continues Toward LEDs

The Program reduced its dependency on CFLs in PY14. There were 1,347,684 Residential and Business CFLs incentivized, this is an 11.4% reduction from the 1,501,579 CFLs in PY13. CFL and LED savings remain a significant contributing measure to the Program as shown in **Table 24**.

Due to higher baseline lighting efficiencies, the combined Residential and Business CFL impact continued to decline to 31% of energy and 26% in demand reduction achieved, down from 38% of energy and 39% in demand reduction achieved in PY13. LED impact, however, was higher, driven by maturing LED technology in the business sector. Combined Residential and Business LED impact rose from 14% of energy and 16% of demand reduction achieved in PY13 to 26% of energy and 23% of demand reduction achieved in PY14. The Program continues to rapidly shift to incentivizing only LEDs.

The table below does not include the CFLs (3,394) and LEDs (4,953) provided in the Home Energy-Saving Kits.

Table 24
CFL & LED Statistics

CFL

County Comparison	Business	Residential	Total	%
Honolulu	1,513	967,158	968,671	71.9%
Hawaii	662	207,605	208,267	15.4%
Maui	177	170,921	171,098	12.7%
Total	**2,352**	**1,345,684**	**1,348,036**	**100.0%**

Cost-Effectiveness	Business	Residential	Total
CFL Incentives	11,059	$ 1,728,589	$ 1,739,647
CFL kWh 1st Year	271,577	36,067,136	36,338,713
1st Yr $/kWh	$ 0.041	$ 0.048	$ 0.048
CFL kWh Lifetime	1,774,643	216,251,690	218,026,333
Lifetime $/kWh	$ 0.006	$ 0.008	$ 0.008

Energy Comparison	Business	Residential	Total
CFL Program kWh	271,577	36,067,136	36,338,713
LED Program kWh	20,933,810	9,170,478	30,104,288
Portfolio kWh	54,611,354	61,971,862	116,583,217
CFL % of Energy	0%	58%	31%
LED % of Energy	38%	15%	26%

Incentive Comparison	Business	Residential	Total
CFL Incentives	11,059	1,728,589	1,739,647
LED Incentives	4,037,036	2,689,028	6,726,064
Portfolio Incentives	12,246,110	9,978,127	22,224,237
CFL % of Incentives	0%	17%	8%
LED % of Incentives	33%	27%	30%

LED

County Comparison	Business	Residential	Total	%
Honolulu	95,640	325,643	421,283	66.1%
Hawaii	8,510	114,375	122,885	19.3%
Maui	5,434	87,887	93,321	14.6%
Total	**109,584**	**527,905**	**637,489**	**100.0%**

Cost-Effectiveness	Business	Residential	Total
LED Incentives	$ 4,037,036	$ 2,689,028	$ 6,726,064
LED kWh First Year	20,933,810	9,170,478	30,104,288
First Yr $/kWh	$ 0.193	$ 0.293	$ 0.223
LED kWh Lifetime	233,662,606	137,557,166	371,219,772
Lifetime $/kWh	$ 0.017	$ 0.020	$ 0.018

Demand Comparison	Business	Residential	Total
CFL Program kW	40	4,687	4,727
LED Program kW	2,895	1,382	4,278
Portfolio kW	8,414	10,083	18,497
CFL % of Demand	0%	46%	26%
LED % of Demand	34%	14%	23%

*Includes 50 unit (lamps) over-count from single distributor across two counties

CFL counts dropped by 10.2% compared to PY13 participation numbers whereas LEDs have increased 78%. LEDs will continue to increase their role in the Program-achieved savings. See **Table 25** for details.

Table 25
Impact of Change in CFL Savings Values

CFL Count			
Program Year	**Business**	**Residential**	**Total**
PY2009	77,100	1,004,830	1,081,930
PY2010	60,080	1,738,553	1,798,633
PY2011	81,235	1,841,842	1,923,077
PY2012	11,898	1,763,328	1,775,226
PY2013	3,070	1,498,509	1,501,579
PY2014	2,352	1,345,597	1,347,949
First Year kWh			
Program Year	**Business**	**Residential**	**Total**
PY2009	4,099,193	52,054,220	56,153,413
PY2010	4,985,218	45,779,857	50,765,075
PY2011	12,892,740	53,790,929	66,683,669
PY2012	1,784,176	51,753,273	53,537,449
PY2013	349,959	47,590,167	47,940,126
PY2014	271,577	36,067,136	36,338,713
Average kWh Savings Per Lamp			
Program Year	**Business**	**Residential**	**Total**
PY2009	53	52	52
PY2010	83	26	28
PY2011	159	29	35
PY2012	150	29	30
PY2013	114	32	32
PY2014	115	27	27

Measure Contribution toward Savings Impacts

In PY14, the Program incentivized over 68 measures in 19 different measure categories. High-Efficiency Lighting and Customized Project measures (most of which were also lighting related) accounted for the greatest savings impact and High-Efficiency HVAC was the third most impactful measure category. **Table 26** provides a summary of all measure categories and their respective energy impact for PY14.

- **#1 Contributor - High-Efficiency Lighting** – 46% of first year (down from 65% in PY13) and 39% lifetime energy savings (down from 56% in PY13). LEDs, T8LW and then CFL lighting contributed the most toward the Program.
- **#2 Contributor – Customized Project Measures** - 22% first year and 25% lifetime energy savings. Non-prescriptive (e.g. customized) lighting projects constituted the majority of projects in this category.
- **#3 Contributor – High-Efficiency HVAC** - 8% first year (down from 11% in PY13) and 13% lifetime energy savings (down from 16% in PY13). Chillers, VFDs and Variable Refrigerant Flow Air Conditioners were the most significant contributors to this category.

Table 26
Contribution by Measure Category in Order of Lifetime Energy Impact

Rank	Category	Apps	%	Measure Quantity	Program Demand (kW)	%	Program Energy (kWh 1st Year)	%	Program Energy (kWh - Life)	%	Incentives	%	Lifetime Cost ($/kWh)
1	High-Efficiency Lighting	22,864	35.4%	1,983,051	7,360	39.8%	53,556,003	45.9%	469,335,392	39.4%	$ 5,232,297	23.5%	$ 0.011
2	Customized Project Measures	419	0.6%	3,243	3,332	18.0%	25,076,938	21.5%	293,068,464	24.6%	$ 5,409,772	24.3%	$ 0.018
3	High-Efficiency HVAC	2,569	4.0%	3,335	2,467	13.3%	9,765,446	8.4%	155,973,979	13.1%	$ 2,104,527	9.5%	$ 0.013
4	Business Direct Installation	2,678	4.1%	32,948	785	4.2%	6,132,133	5.3%	85,849,866	7.2%	$ 2,124,758	9.6%	$ 0.025
5	High-Efficiency Water Heating	1,983	3.1%	1,995	745	4.0%	3,954,025	3.4%	56,134,094	4.7%	$ 1,832,891	8.2%	$ 0.033
6	High-Efficiency Appliances	11,470	17.7%	11,346	249	1.3%	4,134,480	3.5%	55,670,215	4.7%	$ 712,315	3.2%	$ 0.013
7	Energy Awareness, Measurement and Control Systems	11,517	17.8%	1,493,620	2,210	11.9%	8,465,197	7.3%	21,371,551	1.8%	$ 1,908,578	8.6%	$ 0.089
8	High-Efficiency Air Conditioning	2,673	4.1%	3,509	227	1.2%	805,061	0.7%	9,321,159	0.8%	$ 138,855	0.6%	$ 0.015
9	Commercial Industrial Processes	41	0.1%	259	67	0.4%	457,664	0.4%	8,811,476	0.7%	$ 144,900	0.7%	$ 0.016
10	High-Efficiency Motors	38	0.1%	2,528	67	0.4%	583,608	0.5%	8,754,121	0.7%	$ 146,560	0.7%	$ 0.017
11	Building Envelope Improvements	33	0.1%	33	173	0.9%	639,250	0.5%	6,392,503	0.5%	$ 149,690	0.7%	$ 0.023
12	High-Efficiency Water Pumping	224	0.3%	231	29	0.2%	384,472	0.3%	5,213,820	0.4%	$ 70,653	0.3%	$ 0.014
13	Energy Efficiency Equipment Kits	13	0.0%	13	242	1.3%	574,934	0.5%	4,205,051	0.4%	$ 129,667	0.6%	$ 0.031
14	Restaurant Targeted Participation Programs	82	0.1%	381	326	1.8%	715,864	0.6%	3,579,318	0.3%	$ 10,530	0.0%	$ 0.003
15	Business Design, Audits and Commissioning	1,738	2.7%	1,736	50	0.3%	672,113	0.6%	3,360,567	0.3%	$ 910,388	4.1%	$ 0.271
16	Direct Installation - Residential Energy Kits	5,935	9.2%	10,485	119	0.6%	390,714	0.3%	1,953,569	0.2%	$ 88,782	0.4%	$ 0.045
17	Direct Installation - Solar Water Heating	70	0.1%	70	27	0.1%	123,387	0.1%	1,850,802	0.2%	$ 579,675	2.6%	$ 0.313
18	Energy Efficiency Equipment Grants	33	0.1%	12,584	21	0.1%	149,583	0.1%	897,500	0.1%	$ 12,975	0.1%	$ 0.014
19	Commercial Kitchen	4	0.0%	4	0	0.0%	2,344	0.0%	28,126	0.0%	$ 950	0.0%	$ 0.034
20	Accounting	250	0.4%	1,577	0	0.0%	0	0.0%	0	0.0%	$ 515,476	2.3%	$ 0
	Total	**64,634**	**100%**	**3,562,948**	**18,497**	**100%**	**116,583,217**	**100%**	**1,191,771,572**	**100%**	**$ 22,224,237**	**100%**	**$ 0.019**

Program Level impacts (first year) were greatest in the Residential Rate Schedule "R" with 61,847,201 kWh or 53% of savings, of which 70% was realized on Oahu. The Oahu Residential rate class provided the greatest savings of 43,151,371 kWh per year of all the rate schedules (37% of PY14 total kWh). A summary of Program energy impacts by rate schedule is provided in **Table 27**.

Table 27
Program Energy Impact (kWh) by Rate Schedule

Island	R	G	J	P	DS	F	Total	%
Hawaii Island	10,132,805	1,150,164	1,765,134	2,019,990	0	91,418	15,159,511	13.0%
Lanai	35,233	28,441	5,102	0	0	0	68,776	0.1%
Maui	8,481,902	509,459	1,626,304	4,526,928	0	0	15,144,594	13.0%
Molokai	45,889	10,500	9,082	0	0	0	65,471	0.1%
Oahu	43,151,371	4,159,705	15,658,870	18,012,817	5,000,939	161,163	86,144,864	73.9%
Total	**61,847,201**	**5,858,269**	**19,064,492**	**24,559,735**	**5,000,939**	**252,581**	**116,583,217**	**100.0%**
Percent	53.0%	5.0%	16.4%	21.1%	4.3%	0.2%	100.0%	

Demand impact had similar results with the Residential Rate schedule customers providing 10,082 kW or 55% of the demand savings. Oahu Residential Rate Customers provided the greatest savings of 7,020 kW of all the rate schedules (38% of PY14 total kW). A summary of Program Level demand impacts by rate schedule is provided in **Table 28**.

Table 28
Program Demand Impact (kW) by Rate Schedule

Island	R	G	J	P	DS	F	Total	%
Hawaii Island	1,648	149	224	294	0	14	2,329	12.6%
Lanai	11	0	1	0	0	0	12	0.1%
Maui	1,393	69	259	648	0	0	2,368	12.8%
Molokai	10	1	2	0	0	0	12	0.1%
Oahu	7,020	533	2,336	3,099	761	28	13,776	74.5%
Total	**10,082**	**751**	**2,821**	**4,040**	**761**	**42**	**18,497**	**100.0%**
Percent	54.5%	4.1%	15.3%	21.8%	4.1%	0.2%	100.0%	

Program Level Energy Impacts by Program and Rate Class

Table 29 shows Business and Residential program energy contributions by rate class.

- **# 1 Contributor - Residential Energy Efficiency Measures (REEM) within the Residential Rate Schedule "R"**
  - 60,718,564 first year kWh (52% of total program)
  - The top three contributors toward this value were residential CFLs, LEDs and Peer Group Comparison. **See Table 57**.

- **# 2 Contributor – Customized Business Energy Efficiency Measures (CBEEM) within the Business Large Customer Rate Schedule "P"**
  - 12,295,622 kWh (11% of total program)
  - Schedule "P" Customers are the biggest energy consumers and they undertake the largest energy-savings projects. **See Table 47**.

Table 29
Program Energy Impact (first year kWh) by Rate Class

Program	R	G	J	P	DS	F	Total	%
BEEM	34,502	1,330,468	7,647,433	11,689,272	1,452,928	0	22,154,603	19.0%
CBEEM	0	588,966	8,681,129	12,295,622	3,548,011	252,581	25,366,309	21.8%
BESM	0	0	241,023	0	0	0	241,023	0.2%
BHTR	897	3,781,578	2,493,511	573,434	0	0	6,849,420	5.9%
Business Programs	**35,399**	**5,701,012**	**19,063,097**	**24,558,327**	**5,000,939**	**252,581**	**54,611,354**	**46.8%**
REEM	60,718,564	13,634	0	1,407	0	0	60,733,605	52.1%
CESH	0	0	0	0	0	0	0	0.0%
RESM	490,956	140,685	255	0	0	0	631,896	0.5%
RHTR	602,282	2,939	1,140	0	0	0	606,361	0.5%
Residential Programs	**61,811,803**	**157,258**	**1,395**	**1,407**	**0**	**0**	**61,971,862**	**53.2%**
Total	**34,502**	**1,330,468**	**19,064,492**	**24,559,735**	**5,000,939**	**252,581**	**116,583,217**	**100.0%**
Percent	**53.0%**	**5.0%**	**16.4%**	**21.1%**	**4.3%**	**0.2%**	**100.0%**	

Program Level Demand Impacts by Program and Rate Class

Table 30 shows Business and Residential program demand contributions by rate class.

- **# 1 Contributor - Residential Energy Efficiency Measures (REEM) within the Residential Rate Schedule "R"**
  - 9,871 kW (53% of total program)
  - The top three contributors toward this value were Residential CFLs, Peer Group Comparison and LEDs.

- **# 2 Contributor - Business Energy Efficiency Measures (BEEM) within the Business Large Customer Rate Schedule "P"**
  - 2,397 kWh (13% of total program)
  - Schedule "P" Customers are the biggest energy consumers and they undertake the largest energy-savings projects.

Table 30
Program Demand Impact (kW) by Rate Class

Program	R	G	J	P	DS	F	Total	%
BEEM	4	195	985	2,397	240	0	3,821	20.7%
CBEEM	0	94	1,287	1,537	521	42	3,481	18.8%
BESM	0	0	0	0	0	0	0	0.0%
BHTR	0	458	548	106	0	0	1,112	6.0%
Business Programs	**4**	**747**	**2,821**	**4,040**	**761**	**42**	**8,414**	**45.5%**
REEM	9,871	3	0	0	0	0	9,874	53.4%
CESH	0	0	0	0	0	0	0	0.0%
RESM	50	0	0	0	0	0	50	0.3%
RHTR	157	2	0	0	0	0	159	0.9%
Residential Programs	**10,078**	**4**	**0**	**0**	**0**	**0**	**10,083**	**54.5%**
Total	**10,082**	**751**	**2,821**	**4,040**	**761**	**42**	**18,497**	**100.0%**
Percent	**54.5%**	**4.1%**	**15.3%**	**21.8%**	**4.1%**	**0.2%**	**100.0%**	

Customer Level Energy Impacts by Program and Rate Class

Table 31 shows Business and Residential program energy contributions by rate class.

- **# 1 Contributor - Residential Energy Efficiency Measures (REEM) within the Residential Rate Schedule "R"**
  - 69,469,208 kWh (52% of total program)
  - The top three contributors toward this value were Residential CFLs, LEDs, and Peer Group Comparison.

- **# 2 Contributor – Customized Business Energy Efficiency Measures (CBEEM) within the Business Large Customer Rate Schedule "P"**
  - 14,795,969 kWh (11% of total program)
  - Schedule "P" Customers are the biggest energy consumers and they undertake the largest energy-savings projects. High performance lighting driven by LED retrofits was the top contributor to this category.

Table 31
Customer Energy Impact (kWh) by Rate Class

Program	R	G	J	P	DS	F	Total	%
BEEM	41,545	1,603,346	9,103,106	14,076,592	1,742,589	0	26,567,178	19.7%
CBEEM	0	707,996	10,426,720	14,795,969	4,255,358	305,119	30,491,162	22.7%
BESM	0	0	232,760	0	0	0	232,760	0.2%
BHTR	815	3,455,249	2,481,038	522,574	0	0	6,459,676	4.8%
Business Programs	**42,359**	**5,766,590**	**22,243,624**	**29,395,136**	**5,997,947**	**305,119**	**63,750,776**	**47.4%**
REEM	69,469,208	15,743	0	1,644	0	0	69,486,595	51.6%
CESH	0	0	0	0	0	0	0	0.0%
RESM	481,309	137,559	249	0	0	0	619,117	0.5%
RHTR	734,728	3,621	1,405	0	0	0	739,754	0.5%
Residential Programs	**70,685,245**	**156,923**	**1,654**	**1,644**	**0**	**0**	**70,845,465**	**52.6%**
Total	**70,727,604**	**5,923,513**	**22,245,277**	**29,396,780**	**5,997,947**	**305,119**	**134,596,241**	**100.0%**
Percent	52.5%	4.4%	16.5%	21.8%	4.5%	0.2%	100.0%	

Customer Level Demand Impacts by Program and Rate Class

Table 32 shows Business and Residential program demand contributions by rate class.

- **# 1 Contributor – Residential Energy Efficiency Measures (REEM) within the Residential Rate Schedule "R"**
  - 11,294 kW (53% of total program)
  - The top three contributors toward this value were Residential CFLs, Solar Water Heating and Peer Group Comparisons.

- **# 2 Contributor – Business Energy Efficiency Measures (BEEM) within the Business Large Customer Rate Schedule "P"**
  - 2,884 kWh (13% of total program)
  - Schedule "P" Customers are the biggest energy consumers and they undertake the largest energy-savings projects.

Table 32
Customer Demand Impact by Rate Class

Program	R	G	J	P	DS	F	Total	%
BEEM	4	235	1,172	2,884	288	0	4,584	21.4%
CBEEM	0	113	1,546	1,850	625	50	4,184	19.5%
BESM	0	0	0	0	0	0	0	0.0%
BHTR	0	418	595	96	0	0	1,109	5.2%
Business Programs	**4**	**766**	**3,313**	**4,830**	**913**	**50**	**9,877**	**46.1%**
REEM	11,294	3	0	0	0	0	11,297	52.7%
CESH	0	0	0	0	0	0	0	0.0%
RESM	49	0	0	0	0	0	49	0.2%
RHTR	192	2	0	0	0	0	194	0.9%
Residential Programs	**11,535**	**5**	**0**	**0**	**0**	**0**	**11,541**	**53.9%**
Total	**11,540**	**771**	**3,314**	**4,830**	**913**	**50**	**21,418**	**100.0%**
Percent	**53.9%**	**3.6%**	**15.5%**	**22.6%**	**4.3%**	**0.2%**	**100.0%**	

Energy Efficiency Portfolio Standard (EEPS) Impacts

2014 Energy Efficiency Potential Study

For continued reference, as noted in last year's report, a potential study was commissioned by the PUC and conducted by EnerNOC Utility Solutions Consulting. It is an independent evaluation of energy efficiency (EE) market potential in the State of Hawaii from 2013-2030. This study identifies the potential energy savings that can be achieved by contributing entities toward the goals outlined in the EEPS.

The Executive Summary of the report can be found at:
http://puc.hawaii.gov/reports/energy-reports/attachment/state_of_hi_potential_study_final/

The following are the key findings and figure excerpted from the report.

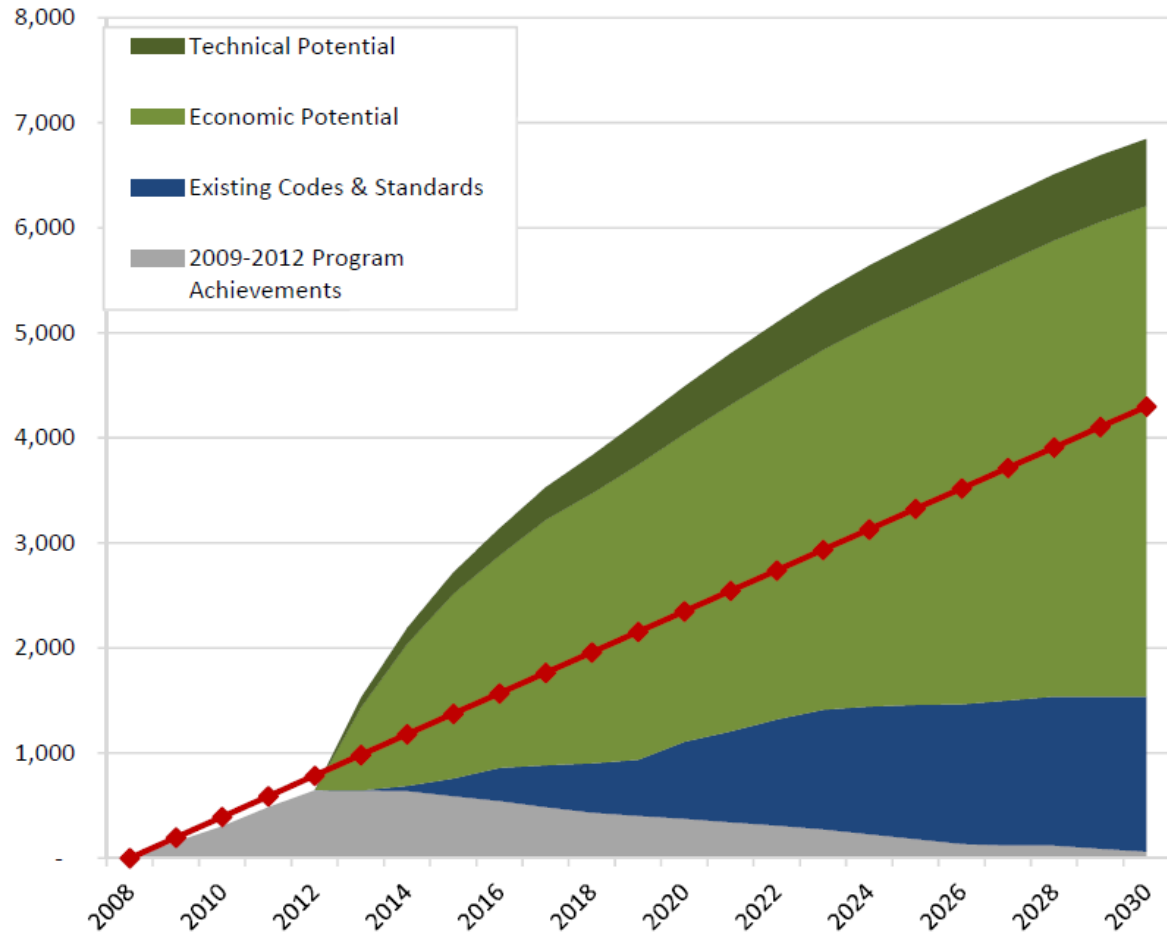
Key Findings

The purpose of the study was to assess whether the State is on track to meet the EEPS goals by 2030. As shown in Figure ES-1, this study concludes it is **highly** likely that the **EEPS** goals can be met through a combination of interventions:

- **Energy-efficiency programs** like those being delivered by Hawai'i Energy [the Public Benefits Fee Administrator (PBFA)][1] and Kauai Island Utility Cooperative (KIUC)
- **Existing appliance standards and building codes** that are already in place or "on the books" for the next five years. Federal, state and local codes and standards taking effect on or after January 1, 2009 count toward EEPS goals. Savings from these existing codes and standards are substantial and reflect the federal Energy Independence and Security Act of 2007 (EISA) lighting standard and several federal appliance standards that were established since the EEPS goal was set in 2008.
- **Economic potential** is the amount of cost-effective potential remaining after appliance standards and building codes are taken into consideration. In addition to savings that can be gained through future EE programs, economic potential also includes savings that result from changes in manufacturing practices as a result of agreements with ENERGY STAR or energy efficiency agencies (most notable for consumer electronics) and savings from early adopters that purchase energy-efficient appliances or equipment **outside** of programs. While these latter two categories, (savings from manufacturing practices and from early adopters) are not directly attributed to energy efficiency programs offered by KIUC or the PBFA, the savings are significant. If a method can be developed to measure the savings from these categories in the future, it might be appropriate to count these savings toward the EEPS goal.

Figure ES-1 shows the year-by-year potential savings from the interventions against the EEPS goal. This study was grounded in 2012 and estimates potential savings for 2013 through 2030. For 2009–2012, program savings estimates developed outside this study were used and are assumed to decay over time. The study estimates that cost-effective cumulative energy efficiency potential in 2030 is 6,210 GWh, or about 144% of current EEPS goals. This indicates that the while the EEPS goals are aggressive, it is likely they can be met cost-effectively.

Figure ES-1 Potential Savings Estimates Compared to the EEPS Goal (GWh)



Application of Sixth Year Energy Savings towards EEPS Goal

The targeted EEPS goal is a 4,300 GWh reduction in 2030 (see Figure ES-1 from the study, on previous page). This goal will be achieved through the result of many actions, including energy efficiency retrofits, increased appliance standards, product improvements to meet consumer demands for longer battery lives and less environmental impact, building codes, behavior change and much more. Hawaii Energy will capture many of these actions through programs and services.

Cumulative Impacts of Energy Efficiency, Rooftop PV Installations and Unclaimed DSM/Market-Driven EE

Figure 5 provides a high-level view of the impacts and order of magnitudes that various activities have and may have on electrical consumption in Hawaii from 2000 to 2030. The items shown are:

Electrical Energy Usage Estimates

A. *EEPS / HCEI / IRP Electrical Usage Baseline Forecast* (orange dotted line) – This is the original electrical energy forecast for the HECO companies based on the Integrated Resource Plan 3.

B. *State of Hawaii GDP Prediction of Electricity Sales* (green line) – This line is based on a simple Hawaii State Gross Domestic Product (GDP) relation to energy consumption from 2000 to 2004. Energy sales matched the line closely during the period of tuning and show clearly the impact of the 2008 economic downturn where it sharply declined for one year and returned to a growth in expected sales.

C. *State of Hawaii GDP with Weather Adjustment Cooling Degree Day (CDD) Prediction of Electricity Sales* (green line with Circle Markers) – This line adjusts sales due to how much the high daily temperature was above 65°F.

Electrical Sales & Reduction Items

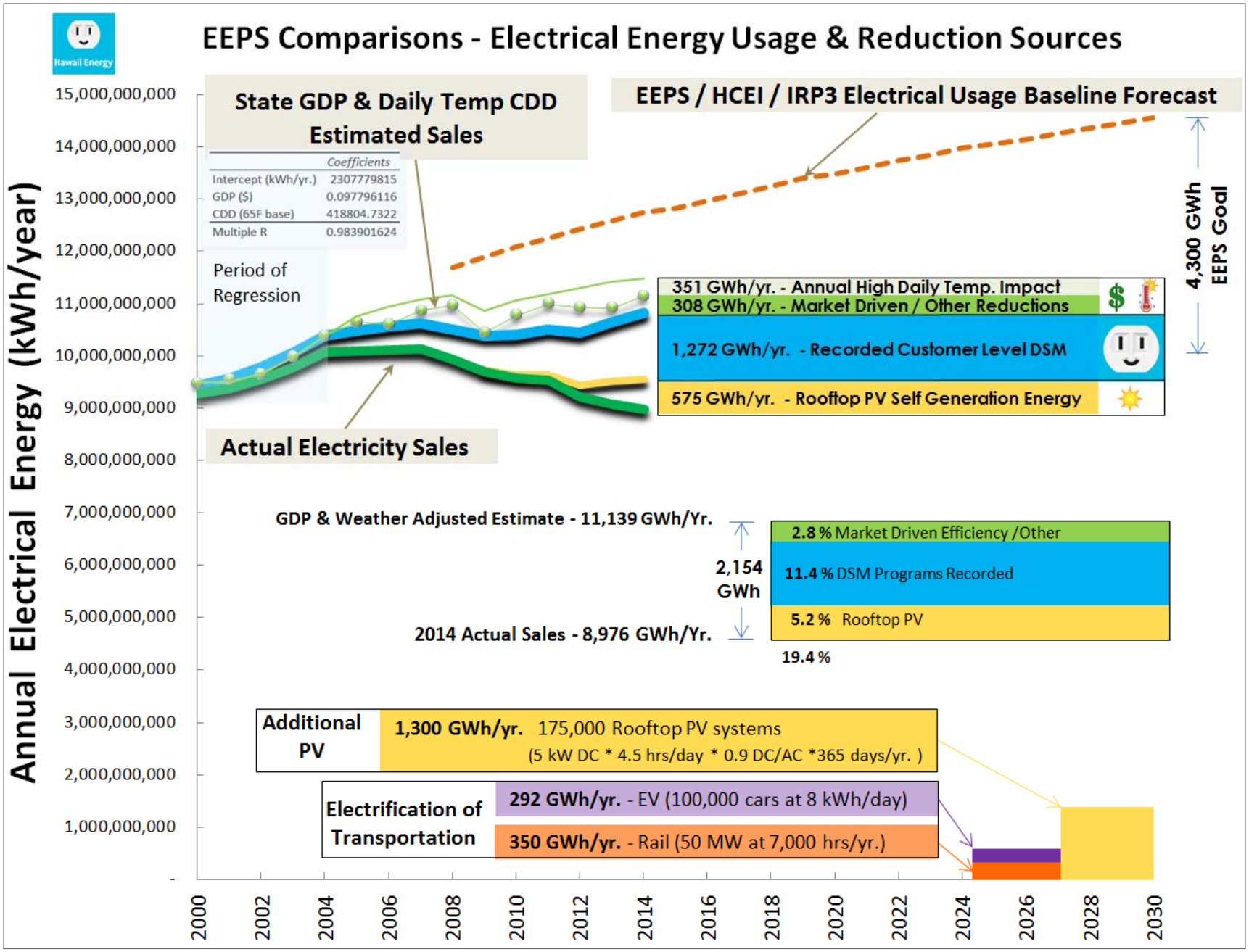
D. *Actual Electrical Sales* (dark green heavy solid line) – This is the actual annual sales for HECO, MECO and HELCO. There is a pronounced flattening of sales starting in 2004 until the 2007, when sales actually started to decline, a year prior to the 2008 economic downturn.

E. *Actual Sales + Estimated Roof Top PV Self-Generation* (yellow heavy line) – This line adds in the energy use that roof top PV systems are estimated to generate. In 2014, it is estimated that the PV systems generated 575 GWh.

F. *Actual Sales + Estimated Roof Top PV + Cumulative Impact of DSM Programs* (light blue heavy line) – This line adds in the customer level energy reductions recorded by the DSM programs since 1996. All measures savings have been allowed to remain without decay with the expectation that they will be replaced with as-good or better performing equipment or operations.

G. *Market Driven / Other Reductions* - The gap between “A” and “F” lines are remaining undefined impacts that include market-driven actions including naturally occurring energy efficiency outside of the DSM programs, savings not claimed by DSM above recorded, fuel conversions such as cogeneration, and other factors.

Figure 5


EEPS Comparisons - Electrical Energy Usage & Reduction Sources
Hawaii Energy
Annual Electrical Energy (kWh/year)
15,000,000,000
14,000,000,000
13,000,000,000
12,000,000,000
11,000,000,000
10,000,000,000
9,000,000,000
8,000,000,000
7,000,000,000
6,000,000,000
5,000,000,000
4,000,000,000
3,000,000,000
2,000,000,000
1,000,000,000
-
State GDP & Daily Temp CDD Estimated Sales
Coefficients
Intercept (kWh/yr.) 2307779815
GDP ($) 0.097796116
CDD (65F base) 418804.7322
Multiple R 0.983901624
Period of Regression
Actual Electricity Sales
EEPS / HCEI / IRP3 Electrical Usage Baseline Forecast
4,300 GWh EEPS Goal
351 GWh/yr. - Annual High Daily Temp. Impact
308 GWh/yr. - Market Driven / Other Reductions
1,272 GWh/yr. - Recorded Customer Level DSM
575 GWh/yr. - Rooftop PV Self Generation Energy
GDP & Weather Adjusted Estimate - 11,139 GWh/Yr.
2,154 GWh
2014 Actual Sales - 8,976 GWh/Yr.
2.8 % Market Driven Efficiency /Other
11.4 % DSM Programs Recorded
5.2 % Rooftop PV
19.4 %
Additional PV
1,300 GWh/yr. 175,000 Rooftop PV systems
(5 kW DC * 4.5 hrs/day * 0.9 DC/AC *365 days/yr.)
Electrification of Transportation
292 GWh/yr. - EV (100,000 cars at 8 kWh/day)
350 GWh/yr. - Rail (50 MW at 7,000 hrs/yr.)
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024
2026
2028
2030

Hawaii Energy Program Attributed Savings vs. EEPS Goal

Figure 6 shows the relationship between the energy savings claimed by the Program in a single year and the true impact towards the EEPS goal.

The farthest right column shows the Program claimed an attributed 116,583,217 kWh/year. This is made up of both a discounted value of customer level savings "net" and credited utility system losses.

The customer level savings realized is discounted by two items:

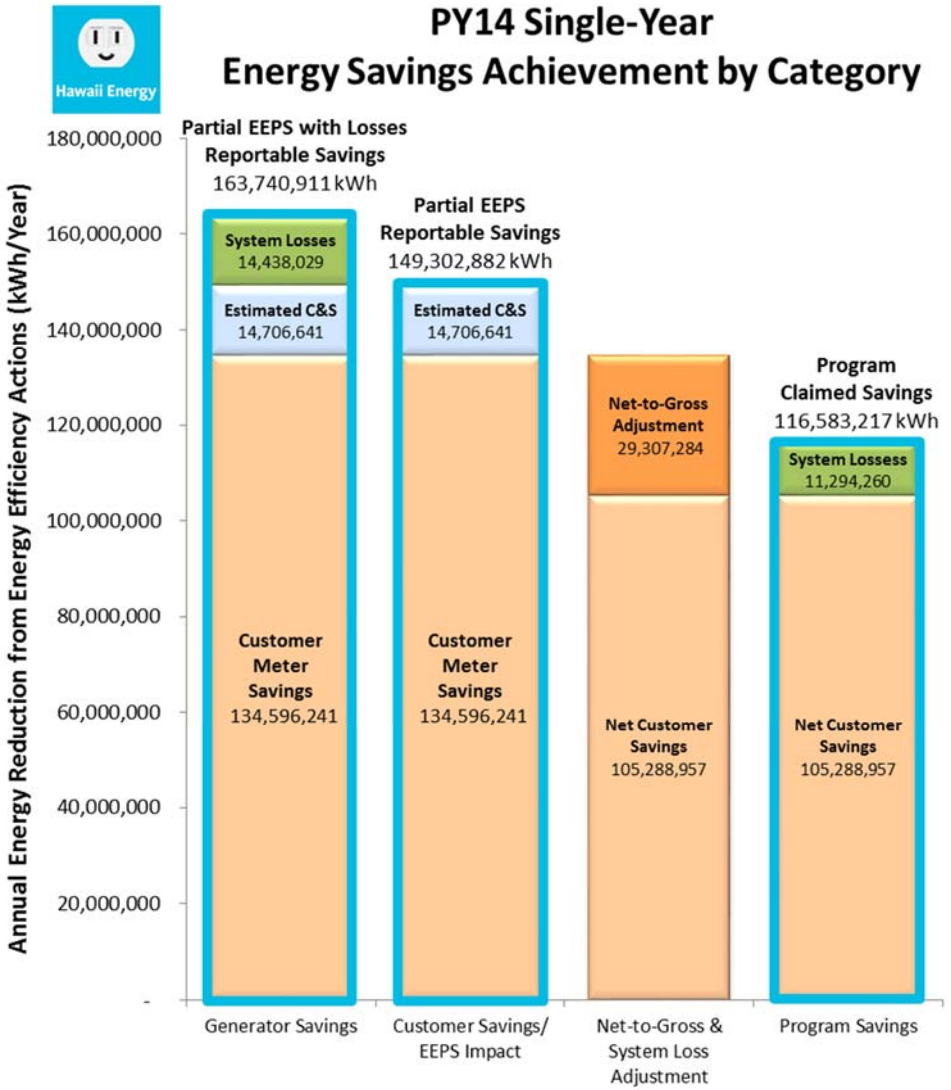
1. *Net-to-Gross* – The estimate of how many participants would have performed the energy reduction actions without program assistance.
2. *Codes & Standards* – This is the savings attributed to legal or industry driven efficiency of equipment and designs over the existing equipment that was replaced.

In PY14, the Partial EEPS Reportable Savings (a result of the actual savings from existing equipment to new equipment), which includes the impacts of improved codes and standards, would be 149,302,882 kWh/year. This 149 GWh/year is limited to the projects tracked and incentivized by Hawaii Energy. There are more energy-reducing projects that are implemented outside of Hawaii Energy involvement that could be incorporated into EEPS savings; Hawaii Energy intends to add tracking for these projects.

The PY14 Partial EEPS with losses Reportable Savings would be 163,740,911 kWh/year. This is generator-level savings that includes utility system losses of 14,438,029 kWh/year.

N-T-G Adjust	**100 Participants in a Program** **- 24 would have done anyway** **+ 5 took actions and not incentive** **81 Were influenced by Program**
Estimated C&S	**Existing Lamp is a 100 W Incan. Lamp** **C&S mandates a 72 W Incan. Lamp** **18 W LED Lamp Selected:** **100 W - 72 W = 28 W C&S Credit** **72 W - 18 W = 54 W Program Credit** **100 W - 18 W = 82 W Customer Savings**

Figure 6



Portfolio Impacts Relative to Load

Tables 33, 33a and 34 show the Program and Customer Level Impacts as compared to PY14 electricity sales.

Customer level savings were equivalent to 1.5% of the 2014 annual energy usage and 1.4% of the peak demand for the utility customers.

Hawaii and Maui counties had the greatest energy reduction as a percent of each island's usage at 1.6% each. Maui had the largest demand reduction as a percent of its island peak at 1.5%.

Table 33
Energy Impacts vs. Sales

Island	2014 kWh Sales*	Customer Level Savings	% of Island Sales	% of Total Sales	Program Level Savings	% of Island Sales	% of Total Sales
Hawaii	1,062,511,291	17,501,912	1.6%	0.2%	15,159,511	1.4%	0.2%
Lanai	26,528,809	73,138	0.3%	0.0%	68,776	0.3%	0.0%
Maui	1,076,319,631	17,700,427	1.6%	0.2%	15,144,594	1.4%	0.2%
Molokai	29,206,727	76,236	0.3%	0.0%	65,471	0.2%	0.0%
Oahu	6,781,664,556	99,244,529	1.5%	1.1%	86,144,864	1.3%	1.0%
Total	**8,976,231,014**	**134,596,241**		**1.5%**	**116,583,217**		**1.3%**

* DBEDT - Monthly Energy Trends - http://files.hawaii.gov/dbedt/economic/data_reports/energy-trends/Monthly_Energy_Data.xlsx

** HEI 2014 10K Report - http://phx.corporate-ir.net/External.File?item=UGFyZW50SUQ9MjcwMzYyfENoaWxkSUQ9LTF8VHlwZT0z&t=1

Table 33a
HECO Sales vs. Generated & Purchased

HECO Consolidated Operating Statistics*	kWh/Yr	%
Net Generated and Purchased	9,438,000,000	100%
Sales	8,976,200,000	95%
System Losses and Use	**461,800,000**	**5%**

*HEI 2014 10K

Table 34
Demand Impacts vs. Sales

Island	2014 kW Peak*	Customer Level Reduction	% of Island Peak	% of Total Peak	Program Level Reduction	% of Island Peak	% of Total Peak
Hawaii	187,800	2,698	1.4%	0.2%	2,329	1.2%	0.1%
Lanai	5,000	14	0.3%	0.0%	12	0.2%	0.0%
Maui	190,700	2,771	1.5%	0.2%	2,368	1.2%	0.2%
Molokai	5,400	14	0.3%	0.0%	12	0.2%	0.0%
Oahu	1,165,000	15,922	1.4%	1.0%	13,776	1.2%	0.9%
Total	**1,553,900**	**21,418**		**1.4%**	**18,497**		**1.2%**

* Reported HEI 2014 10K Report (noncoincident and nonintegrated)

Portfolio Total Resource Benefit (TRB) and Total Resource Cost (TRC)

TRB

The utilities' total avoided cost of all saved energy and capacity avoided is called the Total Resource Benefit (TRB). The total Program portfolio had a net TRB of $144,820,605. **Table 35 & 36** shows the measures and their relative contributions.

The top three measure categories, shown in **Table 35**, provided 77% of the TRB value. They are: High-Efficiency Lighting, Customized Project Measures, and High-Efficiency HVAC.

- *High-Efficiency Lighting* – The largest contributor to the TRB at $57,823,193 (39.9%).
- *Customize Projects* – The second measure to offer significant contribution at $33,461,815 (23.1%) were customized projects.
- *High-Efficiency HVAC* – The third largest measure contributing to the TRB at $20,507,196 (14.2%) was High-Efficiency HVAC.

The top three measures (These can cross categories, for example High-Efficiency Lighting in Customized Projects), shown in **Table 36**, provided 56% of the TRB value. They are LED Lighting, CFL, and T12 to T8 Low Wattage retrofits.

- *LED Lighting* – The largest contributor to the TRB at $42,336,947 (29.2%).
- *CFL* – The second measure to offer significant contribution at $28,783,208 (19.9%) were customized projects.
- *T12 to T8 Low Wattage* - The third largest measure contributing to the TRB at $9,971,334 (6.9%).

The net TRB of $144,820,605 is based on the Program's standard calculation using the legacy utility avoided cost in **Example 1**. The Program is introducing a new TRB calculation in PY15, shown in **Example 2** below, based on guidelines to use an initial $0.161/kWh avoided cost figure and escalate it at 3% per year. This is further explained in the *Development of Avoided Costs* section at the end of this report.

Using the avoided costs in **Example 2**, and adopting the calculation of the TRB value at the end of the Program Year (i.e. PY14 = 2015 utility avoided cost), the PY14 TRB would increase by approximately $51,600,000 to $196,420,605.

Example 1: UPDATED UTILITY AVOIDED COST AND NON-UTILITY IMPACTS USING LEGACY METHOD

Hawaii Energy - PY14 - TRB Values Using Legacy Utility Avoided Cost								
		Discount Rate						
		6%	HECO IRP4 Avoided Cost		NPV for each Year		NPV Cumulative from Final Year	
Year	Period	NPV Multiplier	$/kW/yr.	$/kWh/yr.	$/kW/yr.	$/kWh/yr.	$/kW/yr.	$/kWh/yr.
2014	1	1.00	$ 370.6	$ 0.109	$ 371	$ 0.1089	$ 371	$ 0.1089
2015	2	0.94	$ 382.5	$ 0.112	$ 361	$ 0.1060	$ 731	$ 0.2149
2016	3	0.89	$ 386.2	$ 0.113	$ 344	$ 0.1010	$ 1,075	$ 0.3158
2017	4	0.84	$ 387.7	$ 0.114	$ 326	$ 0.0956	$ 1,401	$ 0.4115
2018	5	0.79	$ 389.1	$ 0.114	$ 308	$ 0.0905	$ 1,709	$ 0.5020
2019	6	0.75	$ 391.9	$ 0.115	$ 293	$ 0.0860	$ 2,002	$ 0.5880
2020	7	0.70	$ 390.7	$ 0.115	$ 275	$ 0.0809	$ 2,277	$ 0.6689
2021	8	0.67	$ 394.6	$ 0.116	$ 262	$ 0.0771	$ 2,540	$ 0.7460
2022	9	0.63	$ 398.3	$ 0.117	$ 250	$ 0.0734	$ 2,790	$ 0.8194
2023	10	0.59	$ 397.4	$ 0.117	$ 235	$ 0.0691	$ 3,025	$ 0.8885
2024	11	0.56	$ 401.4	$ 0.118	$ 224	$ 0.0658	$ 3,249	$ 0.9544
2025	12	0.53	$ 405.7	$ 0.119	$ 214	$ 0.0628	$ 3,463	$ 1.0172
2026	13	0.50	$ 409.3	$ 0.120	$ 203	$ 0.0597	$ 3,666	$ 1.0769
2027	14	0.47	$ 415.9	$ 0.122	$ 195	$ 0.0573	$ 3,861	$ 1.1342
2028	15	0.44	$ 423.3	$ 0.124	$ 187	$ 0.0550	$ 4,048	$ 1.1892
2029	16	0.42	$ 428.9	$ 0.126	$ 179	$ 0.0526	$ 4,227	$ 1.2418
2030	17	0.39	$ 433.9	$ 0.128	$ 171	$ 0.0504	$ 4,398	$ 1.2922
2031	18	0.37	$ 438.9	$ 0.130	$ 163	$ 0.0483	$ 4,561	$ 1.3404
2032	19	0.35	$ 443.9	$ 0.132	$ 156	$ 0.0462	$ 4,717	$ 1.3867
2033	20	0.33	$ 448.9	$ 0.134	$ 148	$ 0.0443	$ 4,865	$ 1.4310
2034	21	0.31	$ 453.9	$ 0.136	$ 142	$ 0.0424	$ 5,007	$ 1.4734
2035	22	0.29	$ 458.9	$ 0.138	$ 135	$ 0.0406	$ 5,141	$ 1.5139
2036	23	0.28	$ 463.9	$ 0.140	$ 129	$ 0.0388	$ 5,270	$ 1.5528
2037	24	0.26	$ 468.9	$ 0.142	$ 123	$ 0.0372	$ 5,393	$ 1.5900
2038	25	0.25	$ 473.9	$ 0.144	$ 117	$ 0.0356	$ 5,510	$ 1.6255

Example 2: NEW PROPOSED UTILITY AVOIDED COST AND NON-UTILITY IMPACTS

Hawaii Energy - PY14 - TRB Values Using Modified Current EEPS Utility Avoided Cost

			Discount Rate	Factored EEPS	Escalation Rate				
			6%	76%	3%				
				Utility Avoided Costs*		NPV for each Year		NPV Cumulative from Final Year	
Program Year	Year	Period	NPV Multiplier	$/kW/yr.	$/kWh/yr.	$/kW/yr.	$/kWh/yr.	$/kW/yr.	$/kWh/yr.
PY14	2015	1	1.00		$ 0.161	$ -	$ 0.1610	$ -	$ 0.1610
PY15	2016	2	0.94		$ 0.161	$ -	$ 0.1519	$ -	$ 0.3129
PY16	2017	3	0.89		$ 0.166	$ -	$ 0.1476	$ -	$ 0.4605
PY17	2018	4	0.84		$ 0.171	$ -	$ 0.1434	$ -	$ 0.6039
PY18	2019	5	0.79		$ 0.176	$ -	$ 0.1394	$ -	$ 0.7432
PY19	2020	6	0.75	$ 904	$ 0.181	$ 676	$ 0.1354	$ 676	$ 0.8786
PY20	2021	7	0.70	$ 986	$ 0.187	$ 695	$ 0.1316	$ 1,371	$ 1.0102
PY21	2022	8	0.67	$ 856	$ 0.192	$ 569	$ 0.1279	$ 1,940	$ 1.1381
PY22	2023	9	0.63	$ 750	$ 0.198	$ 471	$ 0.1242	$ 2,410	$ 1.2623
PY23	2024	10	0.59	$ 663	$ 0.204	$ 392	$ 0.1207	$ 2,803	$ 1.3830
PY24	2025	11	0.56	$ 590	$ 0.210	$ 329	$ 0.1173	$ 3,132	$ 1.5003
PY25	2026	12	0.53	$ 527	$ 0.216	$ 278	$ 0.1140	$ 3,410	$ 1.6143
PY26	2027	13	0.50	$ 474	$ 0.223	$ 236	$ 0.1108	$ 3,646	$ 1.7251
PY27	2028	14	0.47	$ 1,020	$ 0.230	$ 478	$ 0.1076	$ 4,124	$ 1.8327
PY28	2029	15	0.44	$ 1,066	$ 0.236	$ 471	$ 0.1046	$ 4,595	$ 1.9373
PY29	2030	16	0.42	$ 964	$ 0.244	$ 402	$ 0.1016	$ 4,997	$ 2.0389
PY30	2031	17	0.39	$ 875	$ 0.251	$ 344	$ 0.0987	$ 5,342	$ 2.1376
PY31	2032	18	0.37	$ 795	$ 0.258	$ 295	$ 0.0959	$ 5,637	$ 2.2336
PY32	2033	19	0.35	$ 724	$ 0.266	$ 254	$ 0.0932	$ 5,891	$ 2.3268
PY33	2034	20	0.33		$ 0.274	$ -	$ 0.0906	$ 5,891	$ 2.4174
PY34	2035	21	0.31		$ 0.282	$ -	$ 0.0880	$ 5,891	$ 2.5054
PY35	2036	22	0.29		$ 0.291	$ -	$ 0.0855	$ 5,891	$ 2.5909
PY36	2037	23	0.28		$ 0.300	$ -	$ 0.0831	$ 5,891	$ 2.6741
PY37	2038	24	0.26		$ 0.308	$ -	$ 0.0808	$ 5,891	$ 2.7548
PY38	2039	25	0.25		$ 0.318	$ -	$ 0.0785	$ 5,891	$ 2.8333

* EEPS (2013-0056) Avoided Capacity Cost factored by 76% to reflect contribution of kW reductions achieved on Oahu in PY13. $161/MWh Avoided Costs per Guidance Recommendations. This is a conservative estimate based on EEPS 2014 Projections of $192, $225 and $192/MWh for HECO, HELCO and MECO respectively.

TRC

Total Resource Cost is the customer's project or incremental cost to purchase and install the energy-efficient equipment or make operational changes above what would have been done anyway. PY14 Program Savings were achieved with an estimated TRC of $69,343,202. See **Table 37** for a comparison of incremental TRC to total project cost.

The largest customer investments were Customized Project Measures at $33,271,833 (48.0%), followed by High-Efficiency Water Heating at $12,693,400 (18.3%) and High-Efficiency Lighting at $8,967,181 (12.9%). See **Table 35** for details.

Table 35 Portfolio Total Resource Benefit and Costs (TRB & TRC) by Measure Category														
Category	**Program Demand (kW)**	**%**	**Program Energy (kWh 1st Year)**	**%**	**Program Energy (kWh - Life)**	**%**	**Average Measure Life (Years)**	**TRB/ TRC**	**Total Resource Benefit (TRB)**	**%**	**Total Resource Cost (TRC)**	**%**	**Incentives**	**%**
High-Efficiency Lighting	7,360	39.8%	53,556,003	45.9%	469,335,392	39.4%	8.8	6.4	$57,823,193	39.9%	$ 8,967,181	12.9%	$5,741,071	25.8%
Customized Project Measures	3,332	18.0%	25,076,938	21.5%	293,068,464	24.6%	11.7	1.0	$33,461,815	23.1%	$ 33,271,833	48.0%	$5,409,772	24.3%
High-Efficiency HVAC	2,467	13.3%	9,765,446	8.4%	155,973,979	13.1%	16.0	4.8	$20,507,196	14.2%	$ 4,259,823	6.1%	$2,104,527	9.5%
Business Direct Installation	785	4.2%	6,132,133	5.3%	85,849,866	7.2%	14.0	4.5	$9,578,240	6.6%	$ 2,124,513	3.1%	$2,124,758	9.6%
High-Efficiency Water Heating	745	4.0%	3,954,025	3.4%	56,134,094	4.7%	14.2	0.6	$7,159,989	4.9%	$ 12,693,400	18.3%	$1,832,891	8.2%
High-Efficiency Appliances	249	1.3%	4,134,480	3.5%	55,670,215	4.7%	13.5	2.7	$5,237,004	3.6%	$ 1,930,767	2.8%	$732,880	3.3%
Energy Awareness, Measurement And Control Systems	2,210	11.9%	8,465,197	7.3%	21,371,551	1.8%	2.5	1.5	$3,356,232	2.3%	$ 2,256,478	3.3%	$1,908,578	8.6%
High-Efficiency Air Conditioning	227	1.2%	805,061	0.7%	9,321,159	0.8%	11.6	21.0	$1,596,374	1.1%	$ 76,092	0.1%	$138,855	0.6%
Commercial Industrial Processes	67	0.4%	457,664	0.4%	8,811,476	0.7%	19.3	1.7	$845,900	0.6%	$ 503,511	0.7%	$144,900	0.7%
High-Efficiency Motors	67	0.4%	583,608	0.5%	8,754,121	0.7%	15.0	1.8	$927,748	0.6%	$ 529,035	0.8%	$146,560	0.7%
Building Envelope Improvements	173	0.9%	639,250	0.5%	6,392,503	0.5%	10.0	3.8	$1,038,072	0.7%	$ 269,763	0.4%	$149,690	0.7%
High-Efficiency Water Pumping	29	0.2%	384,472	0.3%	5,213,820	0.4%	13.6	1.6	$519,851	0.4%	$ 329,775	0.5%	$70,653	0.3%
Energy Efficiency Equipment Kits	242	1.3%	574,934	0.5%	4,205,051	0.4%	7.3	6.1	$785,128	0.5%	$ 129,667	0.2%	$129,667	0.6%
Restaurant Targeted Participation Programs	326	1.8%	715,864	0.6%	3,579,318	0.3%	5.0	88.6	$844,353	0.6%	$ 9,525	0.0%	$10,530	0.0%
Business Design, Audits And Commissioning	50	0.3%	672,113	0.6%	3,360,567	0.3%	5.0	0.3	$396,111	0.3%	$ 1,294,340	1.9%	$910,388	4.1%
Direct Installation - Residential Energy Kits	119	0.6%	390,714	0.3%	1,953,569	0.2%	5.0	4.2	$372,050	0.3%	$ 88,782	0.1%	$88,782	0.4%
Direct Installation - Solar Water Heating	27	0.1%	123,387	0.1%	1,850,802	0.2%	15.0	0.4	$247,031	0.2%	$ 579,675	0.8%	$579,675	2.6%
Energy Efficiency Equipment Grants	21	0.1%	149,583	0.1%	897,500	0.1%	6.0	8.3	$121,140	0.1%	$ 14,549	0.0%	$14,549	0.1%
Commercial Kitchen	0	0.0%	2,344	0.0%	28,126	0.0%	12.0	0.2	$3,178	0.0%	$ 14,494	0.0%	$950	0.0%
Accounting	0	0.0%	0	0.0%	0	0.0%	0	0.0	$0	0.0%	$ 0	0.0%	- $15,437	0.1%
Total	**18,497**	**100%**	**116,583,217**	**100%**	**1,191,771,572**	**100%**	**10.2**	**2.1**	**$144,820,605**	**100%**	**$ 69,343,202**	**100%**	**$22,224,237**	**100%**

**Accounting records for payments to specific programs including Advanced Power Strips, Multifamily Direct Install, and Power Down Timers, and for non-energy transactions including credit memos, and taxes.*

TRC Test

The societal cost test of the TRB/TRC provides a metric of how much "return on investment" is provided by:

- Saving energy versus creating it (kWh reductions)
- Avoiding the need for increased power plant capacity (Peak kW reductions)

The TRB/TRC ratio of 2.1 indicates that society is getting a 2.1 times return (or 210%) on their investment. Currently this does not include the benefits of avoided transmission and distribution costs or any "externalities" that bring benefit to society, such as reductions in air and water emissions. Refer to **Tables 36-37** for details under TRB/TRC.

Table 36
TRC Measure Values

Measure	Program Demand (kW)	%	Program Energy (kWh 1st Yr)	%	Program Energy (kWh - Life)	%	Average Measure Life (Yrs)	TRB/ TRC	Total Resource Benefit (TRB)	%	Total Resource Cost (TRC)	%	Incentives	%
ENERGY STAR LED Dimmable W/Controls	1	0.0%	7,396	0.0%	88,756	0.0%	12.0	194.8	$ 10,052	0.0%	$ 52	0.0%	$ 430	0.0%
T8 To T8 Low Wattage	7	0.0%	30,163	0.0%	452,452	0.0%	15.0	170.5	$ 61,380	0.0%	$ 360	0.0%	$ 5,115	0.0%
Low-Flow Spray Rinse Nozzles	326	1.8%	715,864	0.6%	3,579,318	0.3%	5.0	88.6	$ 844,353	0.6%	$ 9,525	0.0%	$ 10,530	0.0%
T12 To T8 Standard (3-ft. lamps)	0	0.0%	1,277	0.0%	17,878	0.0%	14.0	62.9	$ 2,076	0.0%	$ 33	0.0%	$ 186	0.0%
Whole House Fan	176	1.0%	353,057	0.3%	7,061,136	0.6%	20.0	27.0	$ 1,301,386	0.9%	$ 48,120	0.1%	$ 30,075	0.1%
VFD - AHU	732	4.0%	1,800,345	1.5%	27,005,169	2.3%	15.0	23.0	$ 4,877,760	3.4%	$ 211,934	0.3%	$ 133,713	0.6%
Delamping	13	0.1%	85,082	0.1%	1,191,149	0.1%	14.0	21.2	$ 138,100	0.1%	$ 6,504	0.0%	$ 4,065	0.0%
Freezer - Bounty	3	0.0%	83,817	0.1%	1,173,437	0.1%	14.0	16.6	$ 103,779	0.1%	$ 6,260	0.0%	$ 6,260	0.0%
Refrigerator - Bounty	23	0.1%	587,630	0.5%	8,226,816	0.7%	14.0	16.5	$ 727,577	0.5%	$ 44,205	0.1%	$ 44,205	0.2%
CEE Tier 1+ Motors	2	0.0%	3,482	0.0%	52,228	0.0%	15.0	14.8	$ 12,156	0.0%	$ 819	0.0%	$ 900	0.0%
VFD - Chilled Water / Condenser Water	498	2.7%	1,834,631	1.6%	24,248,138	2.0%	13.2	14.4	$ 2,983,869	2.1%	$ 207,825	0.3%	$ 195,600	0.9%
CFL	4,707	25.4%	36,189,129	31.0%	217,128,833	18.2%	6.0	14.1	$ 28,783,208	19.9%	$ 2,034,519	2.9%	$ 1,725,098	7.8%
LED Exit Signs	33	0.2%	289,859	0.2%	4,338,550	0.4%	15.0	13.5	$ 454,827	0.3%	$ 33,804	0.0%	$ 31,671	0.1%
Room Occupancy Sensors & Timers	36	0.2%	325,838	0.3%	1,821,022	0.2%	5.6	12.2	$ 318,079	0.2%	$ 26,100	0.0%	$ 26,100	0.1%
Delamping With Reflectors	73	0.4%	560,552	0.5%	7,847,726	0.7%	14.0	11.3	$ 881,249	0.6%	$ 78,220	0.1%	$ 38,705	0.2%
Ceiling Fans	51	0.3%	452,005	0.4%	2,260,023	0.2%	5.0	10.5	$ 294,988	0.2%	$ 27,972	0.0%	$ 108,780	0.5%
Window AC	49	0.3%	96,320	0.1%	1,155,843	0.1%	12.0	9.6	$ 255,501	0.2%	$ 26,550	0.0%	$ 14,750	0.1%
Metal Halide	11	0.1%	79,647	0.1%	1,115,063	0.1%	14.0	9.3	$ 127,826	0.1%	$ 13,753	0.0%	$ 11,945	0.1%

Table 36 TRC Measure Values (cont'd)														
Measure	Program Demand (kW)	%	Program Energy (kWh 1st Yr)	%	Program Energy (kWh - Life)	%	Average Measure Life (Yrs)	TRB/TRC	Total Resource Benefit (TRB)	%	Total Resource Cost (TRC)	%	Incentives	%
CFL Exchange	21	0.1%	149,583	0.1%	897,500	0.1%	6.0	8.3	$ 121,140	0.1%	$ 14,549	0.0%	$ 14,549	0.1%
Custom Lighting	53	0.3%	809,374	0.7%	11,244,268	0.9%	13.9	7.6	$ 1,070,216	0.7%	$ 140,757	0.2%	$ 178,144	0.8%
T12 To T8 Low Wattage	913	4.9%	6,193,365	5.3%	86,707,108	7.3%	14.0	7.3	$ 9,971,334	6.9%	$ 1,366,505	2.0%	$ 1,717,819	7.7%
Window Tinting	163	0.9%	614,714	0.5%	6,147,139	0.5%	10.0	6.5	$ 989,116	0.7%	$ 152,051	0.2%	$ 126,148	0.6%
Package Units – 15% Better Than Code	182	1.0%	986,351	0.8%	14,795,267	1.2%	15.0	6.4	$ 1,831,483	1.3%	$ 284,575	0.4%	$ 398,566	1.8%
Showerhead	62	0.3%	77,945	0.1%	389,723	0.0%	5.0	6.2	$ 134,139	0.1%	$ 21,672	0.0%	$ 21,672	0.1%
Home Energy Saving Kits-Online Fullfillment	242	1.3%	574,934	0.5%	4,205,051	0.4%	7.3	6.1	$ 785,128	0.5%	$ 128,348	0.2%	$ 128,348	0.6%
Efficiency Inside Home Design	0	0.0%	201,039	0.2%	3,015,579	0.3%	15.0	4.9	$ 230,167	0.2%	$ 46,800	0.1%	$ 46,800	0.2%
Water Cooler Timers	131	0.7%	1,756,497	1.5%	8,782,487	0.7%	5.0	4.6	$ 1,036,723	0.7%	$ 225,840	0.3%	$ 225,840	1.0%
Chillers	558	3.0%	3,460,429	3.0%	66,897,327	5.6%	19.3	3.4	$ 7,191,022	5.0%	$ 2,105,964	3.0%	$ 620,351	2.8%
T12 To T8 Standard (2 Ft. Lamps)	17	0.1%	178,655	0.2%	2,501,174	0.2%	14.0	3.4	$ 256,369	0.2%	$ 75,135	0.1%	$ 78,523	0.4%
Aerator	21	0.1%	38,675	0.0%	193,375	0.0%	5.0	3.2	$ 51,575	0.0%	$ 16,199	0.0%	$ 16,199	0.1%
Variable Refrigerant Flow Air Conditioners	560	3.0%	2,056,990	1.8%	30,854,854	2.6%	15.0	3.0	$ 4,509,707	3.1%	$ 1,526,775	2.2%	$ 876,218	3.9%
Building Envelope	40	0.2%	312,443	0.3%	9,373,290	0.8%	30.0	2.8	$ 705,510	0.5%	$ 255,362	0.4%	$ 80,962	0.4%
Refrigerator (with recycling of old)	108	0.6%	2,618,765	2.2%	36,662,713	3.1%	14.0	2.5	$ 3,258,201	2.2%	$ 1,314,360	1.9%	$ 405,925	1.8%
Advance Power Strips	21	0.1%	182,241	0.2%	911,203	0.1%	5.0	2.4	$ 119,068	0.1%	$ 48,838	0.1%	$ 48,901	0.2%
Clothes Washer	100	0.5%	736,402	0.6%	8,836,827	0.7%	12.0	2.3	$ 1,050,127	0.7%	$ 451,000	0.7%	$ 205,000	0.9%
Kitchen Ventilation	43	0.2%	254,466	0.2%	3,816,994	0.3%	15.0	2.2	$ 458,638	0.3%	$ 212,400	0.3%	$ 82,600	0.4%
Domestic Water Booster Packages	26	0.1%	247,424	0.2%	3,711,366	0.3%	15.0	2.0	$ 383,986	0.3%	$ 189,750	0.3%	$ 32,440	0.1%
LED Lighting	4,209	22.8%	29,592,627	25.4%	365,510,898	30.7%	12.4	1.9	$ 42,336,947	29.2%	$ 22,169,166	32.0%	$ 6,588,887	29.6%
VFD Pump (Non-HVAC)	21	0.1%	160,846	0.1%	1,608,464	0.1%	10.0	1.9	$ 197,524	0.1%	$ 105,729	0.2%	$ 42,292	0.2%
ECM	65	0.4%	580,126	0.5%	8,701,894	0.7%	15.0	1.7	$ 915,592	0.6%	$ 528,216	0.8%	$ 145,660	0.7%
Refrigeration	8	0.0%	582,355	0.5%	6,551,918	0.5%	11.3	1.7	$ 549,245	0.4%	$ 326,090	0.5%	$ 130,436	0.6%
Data Centers	42	0.2%	364,098	0.3%	4,369,174	0.4%	12.0	1.7	$ 495,988	0.3%	$ 290,589	0.4%	$ 80,954	0.4%
Solar Attic Fan	5	0.0%	126,763	0.1%	633,816	0.1%	5.0	1.7	$ 67,092	0.0%	$ 40,200	0.1%	$ 13,400	0.1%

Table 36 TRC Measure Values (cont'd)														
Measure	Program Demand (kW)	%	Program Energy (kWh 1st Yr)	%	Program Energy (kWh - Life)	%	Average Measure Life (Yrs)	TRB/TRC	Total Resource Benefit (TRB)	%	Total Resource Cost (TRC)	%	Incentives	%
Custom	56	0.3%	398,821	0.3%	5,444,917	0.5%	13.7	1.5	$ 623,326	0.4%	$ 416,460	0.6%	$ 110,206	0.5%
Submetering (Condo)	86	0.5%	626,454	0.5%	5,011,635	0.4%	8.0	1.3	$ 649,450	0.4%	$ 497,000	0.7%	$ 149,100	0.7%
Transformer	23	0.1%	203,198	0.2%	4,994,482	0.4%	24.6	1.3	$ 387,262	0.3%	$ 291,111	0.4%	$ 62,300	0.3%
Bi-Level Lighting	18	0.1%	181,198	0.2%	2,189,009	0.2%	12.1	1.3	$ 234,720	0.2%	$ 178,240	0.3%	$ 36,381	0.2%
EMS Controls	482	2.6%	3,883,525	3.3%	57,447,577	4.8%	14.8	1.1	$ 6,113,365	4.2%	$ 5,752,024	8.3%	$ 711,838	3.2%
Custom Controls	72	0.4%	742,826	0.6%	6,555,724	0.6%	8.8	1.1	$ 763,181	0.5%	$ 695,668	1.0%	$ 336,849	1.5%
VFD Pool Pumps	3	0.0%	137,048	0.1%	1,502,454	0.1%	11.0	1.0	$ 135,865	0.1%	$ 140,025	0.2%	$ 38,213	0.2%
Refrigerator (Purchase New Only)	4	0.0%	25,677	0.0%	359,477	0.0%	14.0	1.0	$ 43,428	0.0%	$ 44,800	0.1%	$ 14,000	0.1%
Peer Group Comparison - Phase 1/2/3	1,957	10.6%	5,756,406	4.9%	5,756,406	0.5%	1.0	0.9	$ 1,351,980	0.9%	$ 1,507,538	2.2%	$ 1,507,538	6.8%
Water Heating	18	0.1%	138,172	0.1%	764,630	0.1%	5.5	0.9	$ 102,987	0.1%	$ 114,064	0.2%	$ 93,209	0.4%
On Demand Ventilation Control - AC	1	0.0%	12,554	0.0%	188,312	0.0%	15.0	0.7	$ 18,543	0.0%	$ 25,000	0.0%	$ 1,972	0.0%
Solar Water Heating	726	3.9%	3,442,155	3.0%	51,632,322	4.3%	15.0	0.6	$ 6,732,901	4.6%	$ 11,760,075	17.0%	$ 2,332,892	10.5%
Custom HVAC	494	2.7%	2,140,960	1.8%	32,114,393	2.7%	15.0	0.6	$ 4,352,613	3.0%	$ 7,123,483	10.3%	$ 532,813	2.4%
Solar Water Heating Tune-Up	50	0.3%	431,090	0.4%	2,155,452	0.2%	5.0	0.6	$ 282,529	0.2%	$ 509,400	0.7%	$ 254,700	1.1%
LED Refrigerated Case Lighting	35	0.2%	214,405	0.2%	1,281,568	0.1%	6.0	0.6	$ 180,026	0.1%	$ 292,681	0.4%	$ 105,076	0.5%
Custom EMS Controls	35	0.2%	806,282	0.7%	7,996,146	0.7%	9.9	0.4	$ 820,992	0.6%	$ 1,960,281	2.8%	$ 318,463	1.4%
Heat Pump	46	0.3%	635,257	0.5%	6,352,574	0.5%	10.0	0.4	$ 674,119	0.5%	$ 1,513,000	2.2%	$ 79,674	0.4%
Custom VFD For Cooling Tower	27	0.1%	186,079	0.2%	2,462,942	0.2%	13.2	0.4	$ 293,399	0.2%	$ 726,265	1.0%	$ 48,737	0.2%
Cool Roof Technologies	10	0.1%	24,536	0.0%	245,364	0.0%	10.0	0.4	$ 48,956	0.0%	$ 117,712	0.2%	$ 23,542	0.1%
Water Pumping	0	0.0%	241,023	0.2%	1,205,115	0.1%	5.0	0.3	$ 113,582	0.1%	$ 334,741	0.5%	$ 135,000	0.6%
Reach-In Refrigerator Solid Door	0	0.0%	1,423	0.0%	17,072	0.0%	12.0	0.2	$ 1,929	0.0%	$ 9,217	0.0%	$ 850	0.0%
Ice Machine (Add Size Range)	0	0.0%	921	0.0%	11,054	0.0%	12.0	0.2	$ 1,249	0.0%	$ 5,277	0.0%	$ 100	0.0%
Contractor Reward (SBDIL)	0	0.0%	0	0.0%	0	0.0%	0	0.0	$ 0	0.0%	$ 0	0.0%	$ 77,727	0.3%
Recycler App - Freezer	0	0.0%	0	0.0%	0	0.0%	0	0.0	$ 0	0.0%	$ 16,320	0.0%	$ 3,605	0.0%
Accounting	0	0.0%	0	0.0%	0	0.0%	0	0.0	$ 0	0.0%	$ 0	0.0%	$ -15,191	0.1%

Table 36 TRC Measure Values (cont'd)																
Measure	**Program Demand (kW)**	**%**	**Program Energy (kWh 1st Yr)**	**%**	**Program Energy (kWh - Life)**	**%**	**Average Measure Life (Yrs)**	**TRB/TRC**	**Total Resource Benefit (TRB)**	**%**	**Total Resource Cost (TRC)**	**%**	**Incentives**	**%**
Recycler App - Refrigerator	0	0.0%	0	0.0%	0	0.0%	0	0.0	$ 0	0.0%	$ 24,860	0.0%	$ 24,860	0.1%
Efficiency Project Auction	0	0.0%	0	0.0%	0	0.0%	0	0.0	$ 0	0.0%	$ 1,319	0.0%	$ 1,319	0.0%
Energy Study	0	0.0%	0	0.0%	0	0.0%	0	0.0	$ 0	0.0%	$ 165,000	0.2%	$ 235,489	1.1%
Installation Cost - Ladders	0	0.0%	0	0.0%	0	0.0%	0	0.0	$ 0	0.0%	$ 11,058	0.0%	$ 11,058	0.0%
Central Plant Benchmarking	0	0.0%	0	0.0%	0	0.0%	0	0.0	$ 0	0.0%	$ 285,199	0.4%	$ 285,199	1.3%
Custom Water Heater	0	0.0%	0	0.0%	0	0.0%	0	0.0	$ 0	0.0%	$ 3,500	0.0%	$ 3,500	0.0%
Recycler App - Accounting	0	0.0%	0	0.0%	0	0.0%	0	0.0	$ 0	0.0%	$ 0	0.0%	$ 0	0.0%
Recycler App - Window AC	0	0.0%	0	0.0%	0	0.0%	0	0.0	$ 0	0.0%	$ 8,460	0.0%	$ 8,460	0.0%
Total	18,497	100%	116,583,217	100%	1,191,771,572	100%	10.2	2.1	$ 144,820,605	100%	$ 69,343,202	100%	$ 22,224,237	100%
* Accounting records for payments to specific programs including Advanced Power Strips, Multifamily Direct Install, and Power Down Timers, and for non-energy transactions including credit memos, and taxes.														

Table 37 Total vs. Incremental Measure Cost			
Measure	**Measure Total Cost ($)**	**Measure Incremental ($)**	**Difference ($)**
LED Lighting	$25,253,808.33	$22,182,058.98	$3,071,749.35
Solar Water Heating	$11,796,075.00	$11,796,075.00	$ 0.00
Chillers	$10,529,820.00	$2,105,964.00	$8,423,856.00
Custom HVAC	$7,123,483.00	$7,123,483.00	$ 0.00
EMS Controls	$5,752,023.86	$5,752,023.86	$ 0.00
Refrigerator (with Recycling of Old)	$4,383,600.00	$1,315,080.00	$3,068,520.00
Variable Refrigerant Flow Air Conditioners	$3,053,549.00	$1,526,774.50	$1,526,774.50
T12 to T8 Low Wattage	$2,735,508.25	$1,371,453.45	$1,364,054.80
CFL	$2,708,869.14	$2,041,050.04	$ 667,819.10
Clothes Washer	$2,256,650.00	$ 451,330.00	$1,805,320.00
Custom EMS Controls	$1,960,281.00	$1,960,281.00	$ 0.00
Heat Pump	$1,513,000.00	$1,513,000.00	$ 0.00
Peer Group Comparison - Phase 1/2/3	$1,507,537.51	$1,507,537.51	$ 0.00
Package Units - 15% Better Than Code	$1,422,876.00	$ 284,575.20	$1,138,300.80
VFD - AHU	$ 852,175.25	$ 213,043.81	$ 639,131.44
VFD - Chilled Water / Condenser Water	$ 831,300.00	$ 207,825.00	$ 623,475.00
Custom VFD for Cooling Tower	$ 726,264.68	$ 726,264.68	$ 0.00
Custom Controls	$ 695,668.00	$ 695,668.00	$ 0.00
Window Tinting	$ 608,203.36	$ 152,050.84	$ 456,152.52
ECM	$ 528,216.00	$ 528,216.00	$ 0.00
Solar Water Heating Tune-up	$ 509,400.00	$ 509,400.00	$ 0.00
Submetering (Condo)	$ 497,000.00	$ 497,000.00	$ 0.00
Cool Roof Technologies	$ 470,848.60	$ 117,712.15	$ 353,136.45
Custom	$ 416,460.48	$ 416,460.48	$ 0.00
Water Pumping	$ 334,741.33	$ 334,741.33	$ 0.00
Energy Study	$ 330,000.00	$ 165,000.00	$ 165,000.00
Refrigeration	$ 326,090.25	$ 326,090.25	$ 0.00
LED Refrigerated Case Lighting	$ 292,681.00	$ 292,681.00	$ 0.00
Transformer	$ 291,111.00	$ 291,111.00	$ 0.00
Data Centers	$ 290,589.00	$ 290,589.00	$ 0.00
Central Plant Benchmarking	$ 285,199.14	$ 285,199.14	$ 0.00
Building Envelope	$ 255,362.00	$ 255,362.00	$ 0.00

Table 37 (cont'd) Total vs. Incremental Measure Cost			
Measure	**Measure Total Cost ($)**	**Measure Incremental ($)**	**Difference ($)**
Domestic Water Booster Packages	$ 253,000.00	$ 189,750.00	$ 63,250.00
Water Cooler Timers	$ 225,840.00	$ 225,840.00	$ 0.00
Refrigerator (Purchase New Only)	$ 224,800.00	$ 44,960.00	$ 179,840.00
Kitchen Ventilation	$ 212,400.00	$ 212,400.00	$ 0.00
Bi-Level Lighting	$ 178,239.56	$ 178,239.56	$ 0.00
VFD Pool Pumps	$ 171,825.00	$ 140,025.00	$ 31,800.00
Custom Lighting	$ 142,604.79	$ 142,604.79	$ 0.00
Ceiling Fans	$ 139,950.00	$ 27,990.00	$ 111,960.00
Metal Halide	$ 137,532.00	$ 13,753.20	$ 123,778.80
Window AC	$ 132,750.00	$ 26,550.00	$ 106,200.00
Home Energy Saving Kits- Online Fulfillment	$ 128,347.80	$ 128,347.80	$ 0.00
Water Heating	$ 114,064.46	$ 114,064.46	$ 0.00
VFD Pump (Non-HVAC)	$ 105,728.88	$ 105,728.88	$ 0.01
T12 to T8 Standard (2 foot lamps)	$ 84,682.50	$ 75,135.00	$ 9,547.50
Recycler App - Freezer	$ 81,600.00	$ 16,320.00	$ 65,280.00
Delamping with Reflectors	$ 78,220.00	$ 78,220.00	$ 0.00
Advance Power Strips	$ 48,837.93	$ 48,837.93	$ 0.00
Whole House Fan	$ 48,240.00	$ 48,240.00	$ 0.00
Efficiency Inside Home Design	$ 46,800.00	$ 46,800.00	$ 0.00
Refrigerator - Bounty	$ 44,270.00	$ 44,270.00	$ 0.00
Solar Attic Fan	$ 40,200.00	$ 40,200.00	$ 0.00
LED Exit Signs	$ 33,804.00	$ 33,804.00	$ 0.00
CFL Exchange	$ 28,266.17	$ 28,266.17	$ 0.00
Room Occupancy Sensors & Timers	$ 26,100.00	$ 26,100.00	$ 0.00
On Demand Ventilation Control - AC	$ 25,000.00	$ 25,000.00	$ 0.00
Recycler App - Refrigerator	$ 24,860.00	$ 24,860.00	$ 0.00
Custom Water Heater	$ 24,500.00	$ 24,500.00	$ 0.00
Showerhead	$ 21,672.30	$ 21,672.30	$ 0.00
T8 to T8 Low Wattage	$ 18,000.00	$ 360.00	$ 17,640.00
CEE Tier 1+ Motors	$ 16,380.00	$ 819.00	$ 15,561.00
Aerator	$ 16,198.58	$ 16,198.58	$ 0.00

Table 37 (cont'd) Total vs. Incremental Measure Cost			
Measure	**Measure Total Cost ($)**	**Measure Incremental ($)**	**Difference ($)**
Delamping	$ 12,424.00	$ 12,424.00	$ 0.00
Installation Cost - Ladders	$ 11,057.50	$ 11,057.50	$ 0.00
Low-Flow Spray Rinse Nozzles	$ 9,525.00	$ 9,525.00	$ 0.00
Reach-In Refrigerator Solid Door	$ 9,217.00	$ 9,217.00	$ 0.00
Recycler App - Window AC	$ 8,460.00	$ 8,460.00	$ 0.00
Freezer - Bounty	$ 6,260.00	$ 6,260.00	$ 0.00
Ice Machine (add size range)	$ 5,276.80	$ 5,276.80	$ 0.00
ENERGY STAR LED Dimmable w/Controls	$ 2,580.00	$ 51.60	$ 2,528.40
Efficiency Project Auction	$ 1,319.08	$ 1,319.08	$ 0.00
T12 to T8 Standard (3 foot lamps)	$ 660.00	$ 33.00	$ 627.00
Contractor Reward (SBDIL)	$ 0.00	$ 0.00	$ 0.00
Accounting	$ 0.00	$ 0.00	$ 0.00
Recycler App - Accounting	$ 0.00	$ 0.00	$ 0.00
Totals	**$ 93,479,885**	**$ 69,448,582**	**$ 24,031,303**

Island Equity

The Island Equity target is based on incentive dollars spent as compared to the contribution of each County towards the Public Benefits fund.

In PY14, the Program's Island Equity targets were met due to:

- Increased activity in hotel renovations on the neighbor islands
- Airport performance contracts
- Direct install solar water heating on Hawaii island
- Island-wide fresh water leak detection sensor project

Table 38
Program and Customer Level Island Equity by Business and Residential

PY14 Program Level Island Equity by Business and Residential

County	Island	kWh Sales*	%	Business Energy Reduction	% of Business Savings	% of Sales	Residential Energy Reduction	% of Residential Savings	% of Sales	Total Energy Reduction	% of Total Savings	% of Sales
Hawaii	Hawaii Island	1,062,511,291	11.80%	5,022,834	9.2%	0.5%	10,136,676	16.4%	1.0%	15,159,511	13.0%	1.4%
Honolulu	Oahu	6,781,664,556	75.60%	42,867,892	78.5%	0.6%	43,276,972	69.8%	0.6%	86,144,864	73.9%	1.3%
Maui	Lanai, Maui, Molokai	1,132,055,167	12.60%	6,720,628	12.3%	0.6%	8,558,214	13.8%	0.8%	15,278,842	13.1%	1.3%
	Lanai	26,528,809	0.30%	33,543	0.1%	0.1%	35,233	0.1%	0.1%	68,776	0.1%	0.3%
	Maui	1,076,319,631	12.00%	6,667,503	12.2%	0.6%	8,477,092	13.7%	0.8%	15,144,594	13.0%	1.4%
	Molokai	29,206,727	0.30%	19,582	0.0%	0.1%	45,889	0.1%	0.2%	65,471	0.1%	0.2%
Total		**8,976,231,014**	**100.00%**	**54,611,354**	**100.00%**	**0.6%**	**61,971,862**	**100.00%**	**0.7%**	**116,583,217**	**100.00%**	**1.3%**

PY14 Customer Level Island Equity by Business and Residential

County	Island	kWh Sales*	%	Business Energy Reduction	% of Business Savings	% of Sales	Residential Energy Reduction	% of Residential Savings	% of Sales	Total Energy Reduction	% of Total Savings	% of Sales
Hawaii	Hawaii Island	1,062,511,291	11.8%	5,737,020	9.0%	0.5%	11,764,892	16.6%	1.1%	17,501,912	13.0%	1.6%
Honolulu	Oahu	6,781,664,556	75.6%	50,012,354	78.4%	0.7%	49,232,175	69.5%	0.7%	99,244,529	73.7%	1.5%
Maui	Lanai, Maui, Molokai	1,132,055,167	12.6%	8,001,402	12.6%	0.7%	9,848,398	13.9%	0.9%	17,849,801	13.3%	1.6%
	Lanai	26,528,809	0.3%	32,430	0.1%	0.1%	40,707	0.1%	0.2%	73,138	0.1%	0.3%
	Maui	1,076,319,631	12.0%	7,945,141	12.5%	0.7%	9,755,286	13.8%	0.9%	17,700,427	13.2%	1.6%
	Molokai	29,206,727	0.3%	23,831	0.0%	0.1%	52,404	0.1%	0.2%	76,236	0.1%	0.3%
Total		**8,976,231,014**	**100.0%**	**63,750,776**	**100.0%**	**0.7%**	**70,845,465**	**100.0%**	**0.8%**	**134,596,241**	**100.0%**	**1.5%**

*Reported total sales by county in HEI's 2012 10k Annual Report filed with the Securities and Exchange Commission.

Table 39 provides the breakout of incentive spending by Island by Rate Schedule. The residential rate schedule "R" is the highest single rate schedule receiving incentives at 44.7%. The next highest incentive recipient rate schedule is "P" with 23.1%. Schedule "P" customers are Large Power Service users with demand greater than 200 kW per month.

The impact of the actual incentive distributed within each island is: 68.1% of incentive funds on Oahu, 17.5% on Hawaii, 13.2% on Maui, 0.7% on Lanai and 0.6% on Molokai as shown in **Table 39**.

Table 39
Island Incentive Spending by Rate Schedule

Island	R	G	J	P	DS	F	Total	%
Hawaii	$ 2,415,388	$ 342,075	$ 641,881	$ 471,974	$ 0	$ 18,886	$ 3,890,204	17.5%
Lanai	$ 118,556	$ 27,808	$ 1,555	$ 0	$ 0	$ 0	$ 147,919	0.7%
Maui	$ 1,562,999	$ 161,513	$ 311,286	$ 892,180	$ 0	$ 0	$ 2,927,978	13.2%
Molokai	$ 123,846	$ 1,605	$ 2,180	$ 0	$ 0	$ 0	$ 127,631	0.6%
Oahu	$ 5,705,424	$ 1,332,186	$ 3,016,899	$ 3,764,440	$ 1,283,201	$ 28,356	$ 15,130,505	68.1%
Total	**$9,926,211**	**$1,865,188**	**$3,973,801**	**$5,128,594**	**$1,283,201**	**$47,241**	**$22,224,237**	**100.0%**
Percent	44.7%	8.4%	17.9%	23.1%	5.8%	0.2%	100.0%	

Table 40 shows the island equity by program category. In total, energy savings was distributed as follows: 73.9% in Honolulu, 13.0% in Hawaii and 13.1% in Maui counties.

Table 40
Island Equity Energy Savings by Program Category (kWh)

Program	Hawaii Island/ County	Lanai	Maui	Molokai	Maui County	Oahu C&C Honolulu	Total	%
BEEM	2,427,894	5,102	3,070,404	19,582	3,095,088	16,631,621	22,154,603	19.0%
CBEEM	1,174,953	0	3,005,111	0	3,005,111	21,186,245	25,366,309	21.8%
BESM	241,023	0	0	0	0	0	241,023	0.2%
BHTR	1,178,965	28,441	591,987	0	620,428	5,050,026	6,849,420	5.9%
Business Programs	**5,022,834**	**33,543**	**6,667,503**	**19,582**	**6,720,628**	**42,867,892**	**54,611,354**	**46.8%**
REEM	9,986,259	35,233	8,406,733	42,125	8,484,091	42,263,256	60,733,605	52.1%
CESH	0	0	0	0	0	0	0	0.0%
RESM	41,949	0	38,540	3,765	42,305	547,642	631,896	0.5%
RHTR	108,468	0	31,819	0	31,819	466,074	606,361	0.5%
Residential Programs	**10,136,676**	**35,233**	**8,477,092**	**45,889**	**8,558,214**	**43,276,972**	**61,971,862**	**53.2%**
Total	**15,159,511**	**68,776**	**15,144,594**	**65,471**	**15,278,842**	**86,144,864**	**116,583,217**	**100%**
Percent	13.0%	0.1%	13.0%	0.1%	13.1%	73.9%	100%	

Table 41 shows island equity by incentive dollars spent. The actual incentive spending received by each island is broken down as follows: 68.1% in Honolulu, 17.5% in Hawaii and 14.4% in Maui counties.

Table 41 Island Equity Incentives by Program Category								
Program	**Hawaii Island / County**	**Lanai**	**Maui**	**Molokai**	**Maui County**	**Oahu / City & County of Honolulu**	**Total**	**%**
BEEM	$ 429,145	$ 1,555	$ 509,124	$ 3,785	$ 514,464	$ 2,642,918	$ 3,586,527	16.1%
CBEEM	$ 277,050	$ 0	$ 573,696	$ 0	$ 573,696	$ 4,706,453	$ 5,557,198	25.0%
BESM	$ 431,968	$ 0	$ 126,104	$ 0	$ 126,104	$ 328,593	$ 886,665	4.0%
BHTR	$ 333,538	$ 27,808	$ 157,291	$ 0	$ 185,099	$ 1,697,082	$ 2,215,720	10.0%
Business Programs	**$ 1,471,702**	**$ 29,363**	**$ 1,366,215**	**$ 3,785**	**$ 1,399,363**	**$ 9,375,046**	**$ 12,246,110**	**55.1%**
REEM	$ 1,871,253	$ 118,556	$ 1,480,939	$ 121,596	$ 1,721,090	$ 5,418,818	$ 9,011,161	40.5%
CESH	$ 0	$ 0	$ 0	$ 0	$ 0	$ 1,319	$ 1,319	0.0%
RESM	$ 25,200	$ 0	$ 22,950	$ 2,250	$ 25,200	$ 250,950	$ 301,350	1.4%
RHTR	$ 522,050	$ 0	$ 57,875	$ 0	$ 57,875	$ 84,372	$ 664,297	3.0%
Residential Programs	**$ 2,418,503**	**$ 118,556**	**$ 1,561,764**	**$ 123,846**	**$ 1,804,165**	**$ 5,755,459**	**$ 9,978,127**	**44.9%**
Total	**$3,890,204**	**$147,919**	**$2,927,978**	**$127,631**	**$3,203,528**	**$15,130,505**	**$22,224,237**	**100%**
Percent	17.5%	0.7%	13.2%	0.6%	14.4%	68.1%	100%	

BUSINESS PROGRAM

Overall Impacts

For PY14, Hawaii Energy's Business program achieved savings of 54,611,354 kWh (first year), 692,734,369 lifetime kWh and 8,414 kW savings with $12,246,110 in incentives. In relative terms, 55.1% of Hawaii Energy's incentives ($12,246,110 out of $22,224,237 of direct incentives) captured 46.9% of kWh (first year), 58% of lifetime kWh and 45.5% of kW demand first year savings, respectively, with a Total Resource Benefit to Cost ratio of 1.8.

Table 42 provides a detailed breakdown by program with a closer look at each program to follow. For PY14, Hawaii Energy's Business program realized results by continuing to offer programs, services, measures and related incentives to address opportunities in the marketplace and accelerate the adoption of energy-efficient technologies.

A number of the Program's offers are highlighted below as examples of driving energy efficiency projects through productive collaboration with customers, manufacturers, facility management firms, consultants and contractors that produced impressive results.

Table 42
Business Program Impacts Summary

Category	Units	Program Demand (kW)	%	Program Energy (kWh 1st Yr)	%	Program Energy (kWh - Life)	%	Average Measure Life (Years)	TRB/ TRC	Total Resource Benefit (TRB)	%	Total Resource Cost (TRC)	%	Incentives	%
BEEM	88,071	3,821	45.4%	22,154,603	40.6%	308,911,319	44.6%	13.9	4.1	$ 36,751,925	45.3%	$ 8,958,967	19.9%	$ 3,586,527	29.3%
CBEEM	60,199	3,481	41.4%	25,366,309	46.4%	293,171,679	42.3%	11.6	1.0	$ 33,797,316	41.7%	$ 32,943,863	73.1%	$ 5,557,198	45.4%
BHTR	33,335	1,112	13.2%	6,849,420	12.5%	89,446,256	12.9%	13.1	4.9	$ 10,424,522	12.9%	$ 2,143,255	4.8%	$ 2,215,720	18.1%
BESM	69	0	0.0%	241,023	0.4%	1,205,115	0.2%	5.0	0.1	$ 113,582	0.1%	$ 1,043,250	2.3%	$ 886,665	7.2%
Total	**181,674**	**8,414**	**100%**	**54,611,354**	**100%**	**692,734,369**	**100%**	**12.7**	**1.8**	**$ 81,087,345**	**100%**	**$ 45,089,335**	**100%**	**$ 12,246,110**	**100%**

Midstream Program

To increase the effectiveness and efficiency of the commercial lighting program, in PY14 Hawaii Energy launched a midstream commercial lighting program to offer an instant rebate to commercial electric utility account holders at the point of purchase. Instant rebates on prescriptive lighting measures like reduced wattage T8's and LED lamps are offered at point of purchase through local and national lighting distributors. However, any new initiative as complex as this offering takes a significant amount of work on both the program and the participating distributors. Consequently, only one lighting distributor was signed up late in the program year, resulting in energy and demand savings below expectations. However, a significant amount of excitement was generated in the market sector and an additional six distributors have expressed interest in joining the program in PY15.

Energy Efficiency Auction

In PY14 Hawaii Energy conducted its first-ever Energy Efficiency Auction by inviting contractors, energy vendors, property managers and developers to compete for funding of their independent, cost-effective projects that focused on high energy consumption or hard-to-reach businesses. The purpose of the Energy Efficiency Auction was to allow the market to be creative in the actions and measures that achieve the turnkey savings and market penetration

goals. Eligible projects in the auction were any commercially available energy efficiency technology, mass installation opportunity, hard-to-reach market segment or offering either not currently served by existing Hawaii Energy programs or that the contractors were able to accomplish in a more cost-effective manner.

Hawaii Energy allocated up to $1,144,011 in incentives for commercial projects under this initiative. Each commercial project for consideration had to be for at least $50,000 in incentives. Applicants were allowed to request incentives up to, but not exceeding, the overall project cost. Selected projects had to be completed by May 30th, 2015. Hawaii Energy received proposals from 28 companies representing 68 different projects as a result of this Energy Efficiency Auction. From this pool, Hawaii Energy selected three proposals to fund. However, as expected, the short project cycle proved to be a significant barrier for many proposed projects and impacted two of the three proposals selected.

The following three projects were selected for funding:

Honeywell Smart Grid Solutions

This project initially targeted past SBDIL customers across Oahu and was subsequently broadened to any small business with central air conditioning. The project, budgeted for approximately $422,000 offered the installation of Honeywell WiFi 9000 smart thermostats with a software application to enable the small business owner to manage their energy use. When applicable, additional energy efficiency measures were included to increase the overall potential energy savings. With marketing commencing in April, the project's first customers were secured in May.

This project was selected, in part, as an opportunity to broaden Hawaii Energy's offerings to a traditionally underserved market by energy efficiency programs especially on air-conditioning related measures. With such a short period of time to stand up the program and generated demand, this offering will continue in PY15 and run its course as originally proposed.

Ibis Networks

Ibis Networks (Ibis) was selected for its "shovel-ready" project with the University of Hawaii as it fit well with Hawaii Energy's call for innovative solutions. This project, using Ibis' system of InteliSockets, InteliGateways and an InteliNetwork provided an opportunity to demonstrate a technology addressing what is considered to be one of the fastest-growing energy consumers in commercial buildings today; plug loads. This project, spanning three University of Hawaii campuses including Manoa, Windward and Hilo cost $168,140 of which $110,000 was offset by the Hawaii Energy auction.

Deployed and commissioned in May, a baseline was established for each campus with recommendations for policies and changes that would create savings for the school. This enabled discussions to begin with university personnel to consider scheduling and behavioral modifications to save significant amounts of energy during both core and non-core (nights, holidays, weekends) hours. Hawaii Energy, Ibis and the UH campuses will continue monitoring the progress of this project, which has a three year term.

Matrix Direct Install

The final commercial project selected in the Energy Efficiency Auction was a direct install project offered by Matrix Energy Services, Inc. using local electrical contractors. The project was targeted at market segments such as hotels, multi-family facilities, retail, restaurants, grocery and convenience stores, as well as hard-to-reach businesses. The project delivered the following technologies at little or no cost to the customer:

- Screw-in LED bulbs
- Linear LED bulbs
- LED exit signs
- Anti-Sweat Heater Controls
- Door closers for refrigerators and freezers
- Strip curtains for refrigerators and freezers

The project was awarded to Matrix in December 2014, which only left five months to market and deliver energy efficiency solutions to customers. Marketing was completed in April 2015 with proposals made to 163 businesses in the three counties served by the programs. However, as mentioned earlier, the short project cycle did not allow for all of the installations to be completed in PY14. Therefore, this offering will continue in PY15 and run its course as originally proposed.

Central Chiller Plant Benchmarking Program

The Central Plant Benchmarking Program was continued in PY14. The intent of the program is to incentivize certain large local facility operators to install the metering necessary to monitor performance of their chilled water plants. With accurate, real-time operational and efficiency information, building engineers and managers are able to make smarter decisions related to operations, maintenance and capital investment in their facility. For engineers at Hawaii Energy, having access to real-time and trend data for a variety of applications is an invaluable resource.

Direct Install Refrigeration Measures Pilot Program

In grocery stores, refrigeration electricity consumption can be as much as 60% of the customer's total energy consumption. Refrigeration systems are vital pieces of equipment for every foodservice operator, but since these systems operate 24 hours per day, 7 days a week, all year long, the smallest amounts of energy waste resulting from poor maintenance or negligence can add up to substantial costs over time. As part of the energy efficiency auction, a third party contractor submitted a direct install project to reduce the energy consumption of refrigeration units by significantly decreasing the cold air leakage from these systems. Although the original proposal was not sufficiently developed to be accepted as part of the energy auction, Hawaii Energy continued to work with the contractor after the auction was closed to develop a pilot program to offer these refrigeration energy efficiency measures, specifically new refrigeration gaskets, strip curtains and automatic door closers. The pilot program was successful in savings 265,796 kWh per year for nine grocery stores on Oahu at a cost of $50,406 in incentive funds.

Small Business Direct Install Lighting (SBDIL)

This offer provided full-cost lighting retrofits to 570 small businesses and restaurants to achieve 78,370,461 kWh - Life in customer level savings. The $2,124,758 of PBFA funds invested into these projects is now producing over $2,547,824 in annual savings for these businesses. This is a 120% annual Internal Rate of Return (IRR) and will achieve over $35.7 M in lifetime cost savings. The number of participating contractors also doubled.

Overall Expenditures

The Hawaii Energy commercial team continued its focus beyond the BEEM and CBEEM Program in PY14, with the hard-to-reach sector (BHTR) and Business Energy Service and Maintenance (BESM).

See **Table 43** for the detailed expenditures.

Table 43
Business Program Expenditures

	Total Expenditures	PY14 Budget	Percent Spent	Unspent	Percent Unspent
Business (C&I) Programs					
Operations and Management					
BEEM	$ 1,145,534.76	$ 1,160,000.00	98.75%	$ 14,465.24	1.25%
CBEEM	$ 1,183,445.15	$ 1,220,000.00	97.00%	$ 36,554.85	3.00%
BESM	$ 498,397.56	$ 525,000.00	94.93%	$ 26,602.44	5.07%
BHTR	$ 610,986.36	$ 616,130.00	99.17%	$ 5,143.64	0.83%
Total Business Programs	$ 3,438,363.83	$ 3,521,130.00	97.65%	$ 82,766.17	2.35%
Business Evaluation	$ 210,430.20	$ 250,000.00	84.17%	$ 39,569.80	15.83%
Business Outreach	$ 678,511.44	$ 720,000.00	94.24%	$ 41,488.56	5.76%
Total Business Non-Incentives	**$ 4,327,305.47**	**$ 4,491,130.00**	**96.35%**	**$ 163,824.53**	**3.65%**
Business Incentives					
BEEM	$ 3,586,527.04	$ 4,159,550.00	86.22%	$ 573,022.96	13.78%
CBEEM	$ 5,557,198.04	$ 5,862,261.00	95.00%	$ 305,062.96	5.20%
BESM	$ 886,665.49	$ 1,107,500.00	80.06%	$ 220,834.51	19.94%
BHTR	$ 2,215,719.66	$ 2,390,270.00	92.70%	$ 174,550.34	7.30%
Subtotal Business Incentives	$ 12,246,110.23	$ 13,519,581.00	90.58%	$ 1,273,470.77	9.42%
Business Transformational	$ 1,990,261.28	$ 2,135,850.00	93.18%	$ 145,588.72	6.82%
Total Business Incentives	**$ 14,236,371.51**	**$ 15,655,431.00**	**90.94%**	**$ 1,419,059.49**	**9.06%**
Total Business Programs	**$ 18,563,676.98**	**$ 20,146,561.00**	**92.14%**	**$ 1,582,884.02**	**7.86%**

Business Trade Allies

Background

Trade allies include product manufacturers, wholesale and retail suppliers, equipment contractors, architects, engineers and electricians. These individuals and companies are those on the front lines directly responsible for energy efficiency measures being sold, designed, financed, installed, commissioned and maintained. By working with them, the Program is successful in uncovering opportunities to collaborate and support trade allies that leverage resources to promote energy conservation and efficiency.

Clean Energy Ally (CEA) Program

In PY14, Hawaii Energy launched its Clean Energy Ally Program as a means of formalizing its engagement with trade allies and providing additional value to these important individuals and companies responsible for making energy efficiency happen. For full details on the Clean Energy Ally Program, see *Clean Energy Ally (CEA) Program* in the Transformational Section.

Ongoing Training

To be on the cutting edge of the conservation and efficiency field, Hawaii Energy provides ongoing training and support for the trade allies. Over the years, Hawaii Energy has developed a strong training program for lighting and HVAC contractors, mechanical contractors, architects and engineers participating in its business incentive program. During PY14, we augmented these efforts with a number of training sessions specifically for the Clean Energy Allies.

Continuous Feedback

The Clean Energy Ally program has helped Hawaii Energy gain additional intelligence surrounding trade ally perspectives and concerns. We have incorporated this feedback into the program planning process to establish well-supported, effective strategies. Industry groups are another way Hawaii Energy incorporates the views of representatives from key sectors. By sharing insights and experiences on different technology and equipment performance with the trade allies, the Program's knowledge and awareness of different market segments are enhanced, thus helping to influence customer's energy-saving decisions.

See **Table 44** for performance by trade ally. Those trade allies that have signed on as Hawaii Energy's Clean Energy Allies are indicated with an *.

Table 44 Business Project Sources						
Trade Allies	**Measures**	**Customer Level Demand Savings (kW)**	**Customer Level Energy Savings (kWh 1st Yr)**	**Customer Level Energy Savings (kWh - Life)**	**Cumulative Customer Level Energy Savings**	**Incentives**
Direct From Applicants	*1,155*	*5,713*	*34,006,469*	*404,209,621*	*50.1 %*	*$ 6,014,621*
Johnson Controls	72	868	4,439,376	72,343,735	9.0 %	$ 800,917
Energy Industries*	544	578	4,379,439	70,478,757	8.7 %	$ 758,491
EMCC*	588	168	1,547,792	22,418,038	2.8 %	$ 537,831
Lend Lease	3	61	500,575	13,095,456	1.6 %	$122,146
Paradise Lighting*	449	111	885,759	12,649,945	1.6 %	$ 279,100
AMM Electrical & AE Solutions, LLC*	459	158	897,805	12,569,277	1.6 %	$ 395,484
Correa Electric, LLC*	309	80	741,201	10,376,808	1.3 %	$ 224,819
Sylvania Lighting Services*	40	115	732,839	10,166,072	1.3 %	$ 85,385
W Services, LLC	5,104	158	1,772,888	8,864,438	1.1 %	$ 131,280
Trane*	3	24	701,231	8,099,375	1.0 %	$ 125,724
InSynergy Engineering*	5	75	406,267	7,136,595	0.9 %	$ 40,121
Pono Energy Solutions*	370	30	504,259	7,059,624	0.9 %	$ 254,842
Clear Blue Energy Corp*	1	55	381,958	5,729,370	0.7 %	$ 64,107
Hawaii Energy	10	93	590,939	5,696,401	0.7 %	$ 105,442
Dorvin D. Leis	4	85	364,096	5,626,355	0.7 %	$ 57,322
21st Century Lighting*	24	50	451,608	5,562,216	0.7 %	$ 65,872
InnCom	3	83	624,750	5,281,500	0.7 %	$ 83,300
Loeb Lighting Services, Inc.	1	57	498,986	4,989,860	0.6 %	$ 81,981
M. Watanabe Electrical Contractor, Inc.*	8	59	347,181	4,810,951	0.6 %	$ 50,737
Melink Corporation*	8	53	310,694	4,660,410	0.6 %	$ 82,600
Nordic PCL	5	42	256,200	4,520,690	0.6 %	$ 28,205
Photonworks Engineering, LLP*	3	74	648,213	4,015,282	0.5 %	$ 106,538
E Solutions	1	46	398,992	3,989,920	0.5 %	$ 53,579
Chelsea Group*	3	20	209,255	3,956,218	0.5 %	$ 114,606
Pacific Rim Connections	1	32	279,006	3,348,072	0.4 %	$ 59,782
BTS LED*	6	26	219,336	3,290,046	0.4 %	$ 33,269
American LED & Energy*	7	15	153,481	3,222,966	0.4 %	$ 23,744
Gexpro*	1	23	205,552	3,083,280	0.4 %	$ 48,730
WSP Group	24	39	248,742	3,067,998	0.4 %	$ 42,078
Island Energy Systems	4	30	209,245	2,900,890	0.4 %	$ 14,376
Remaining Allies	*2,802*	*857*	*5,836,642*	*69,982,484*	*8.7 %*	*$ 1,359,080*
Totals	**12,017**	**9,877**	**63,750,776**	**807,202,647**	**100.0 %**	**$ 12,246,110**

Business Energy Efficiency Measures (BEEM)

Objectives

The objective of this program is to acquire electric energy and demand savings through customer installations of standard, known energy efficiency technologies by applying prescriptive incentives in a streamlined application process. Measures incentivized through BEEM include:

- High-Efficiency Lighting
- High-Efficiency HVAC such as water-cooled chiller, variable refrigerant flows (VRF) and packaged & split systems
- CEE Premium Efficiency Motors
- High-Efficiency Water Heating
- Variable Frequency Drives (VFDs) connecting to pool pumps, chilled water pumps, condenser water pumps and air handling units
- Window Tinting
- Cool Roof Technology

Hyatt Residence Club
Kaanapali, Maui, Hawaii

The Hyatt Residence Club is a 132-room time share facility in the Kaanapali resort area of Lahaina, Maui, completed on November 14, 2014. Club management became aware of potential energy efficiency upgrades from the engineering team at its sister property, Hyatt Regency Maui. The upgrades included high-efficiency chillers and lighting, heat pumps and a solar water heating system, pump VFDs, guest room EMS systems and more, earning them a $85,276.92 incentive with expected savings of 713, 450 kWh ($192,631) annually.

Accomplishments

ENERGY STAR® LED Lamps

Advancement in the number of LED products available and listed by ENERGY STAR® and an adjustment to the program this year to allow other listings such as DesignLights Consortium® and Lighting Facts® lead to the continued success of LED lamps installed in Program Year 2014. This LED offering achieved energy savings of 3,882,675 kWh this past year or 17.5% of the total BEEM program energy savings. In addition to increasing the usage of LEDs, the offering encouraged customers to upgrade their lighting controls by providing higher incentives for dimmable LED lamps. With dimmable LED lamps customers can achieve even more energy savings.

VFDs on Air Handlers and HVAC Pumps

As the energy efficiency market matures and energy savings get harder to find for a lot of customers, the obvious next path to energy savings is control systems. As such, Hawaii Energy saw an increase in the number VFDs installed and the energy savings they produced. In PY14 VFDs installed in HVAC systems produced energy savings of 3,634,976 kWh or 15.9% of the total BEEM program energy savings.

Impacts

For PY14, the BEEM Program achieved savings of 22,154,603 kWh (first year) and 3,821 kW savings with $3,586,527 in incentives.

In relative terms, the top three BEEM measures totaling 31.9 % of incentives captured a full 50.0% of the lifetime program energy, 43.1% first year kWh, and 37.4% kW of the demand savings.

Table 44a
BEEM Top Three Measures

	Program Demand (kW)	%	Program Energy (kWh First Year)	%	Program Energy (kWh - Life)	%	Incentive ($)	%
LED Lighting	543	14.21%	3,882,675	17.50%	57,891,722	18.74%	$ 291,263	8.10%
Chillers	441	11.54%	2,864,045	12.90%	57,280,892	18.54%	$ 472,280	13.20%
T12 To T8 Low Wattage	445	11.65%	2,808,289	12.70%	39,316,052	12.73%	$ 379,131	10.60%
Top Three Measures	1,429	37.40%	9,555,009	43.10%	154,488,666	50.01%	$ 1,142,674	31.90%
BEEM Total	3,821		22,154,603		308,911,319		$ 3,586,527	
% of Total	37.4%		43.1%		50.0%		31.9%	

Table 45 provides further details.

- **# 1 Contributor to BEEM – LED Lighting (20.4% Lifetime kWh)**
  LED lamps were the largest contributor to the BEEM Program savings with lifetime energy and demand savings of 57,891,722 kWh and 543 kW, respectively. (This includes LED Lighting, LED Exit Signs, LED Refrigerated Case Lighting and ENERGY STAR LED Dimmable with Controls)

- **# 2 Contributor to BEEM – Chillers (18.5% Lifetime kWh)**
  Chiller upgrades were the second largest contributor to the BEEM Program savings with lifetime energy and demand savings of 57,280,892 kWh and 441 kW, respectively.

- **# 3 Contributor to BEEM – T12 to T8 Low Wattage (12.7% Lifetime kWh)**
  There are still T12 upgrades available and they were the third largest contributor to the BEEM Program savings with lifetime energy and demand savings of 39,316,052 kWh and 445 kW.

Table 45 BEEM Program Impacts								
Category	Units	Program Demand (kW)	%	Program Energy (kWh First Year)	%	Program Energy (kWh - Life)	%	Average Measure Life (Years)
LED Lighting	38,778	543	14.2%	3,882,675	17.5%	57,891,722	18.7%	14.9
Chillers	38	441	11.5%	2,864,045	12.9%	57,280,892	18.5%	20.0
T12 To T8 Low Wattage	23,181	445	11.6%	2,808,289	12.7%	39,316,052	12.7%	14.0
VFD - AHU	182	732	19.2%	1,800,345	8.1%	27,005,169	8.7%	15.0
VFD - Chilled Water / Condenser Water	53	498	13.0%	1,834,631	8.3%	24,248,138	7.8%	13.2
Variable Refrigerant Flow Air Conditioners	585	138	3.6%	1,212,093	5.5%	18,181,399	5.9%	15.0
Package Units - 15% Better Than Code	278	182	4.8%	986,351	4.5%	14,795,267	4.8%	15.0
ECM	2,524	65	1.7%	580,126	2.6%	8,701,894	2.8%	15.0
Delamping With Reflectors	2,719	73	1.9%	560,552	2.5%	7,847,726	2.5%	14.0
Water Cooler Timers	8,760	131	3.4%	1,475,187	6.7%	7,375,935	2.4%	5.0
Window Tinting	28	163	4.3%	614,714	2.8%	6,147,139	2.0%	10.0
Submetering (Condo)	994	86	2.2%	626,454	2.8%	5,011,635	1.6%	8.0
Transformer	251	23	0.6%	203,198	0.9%	4,994,482	1.6%	24.6
LED Exit Signs	1,097	32	0.8%	280,519	1.3%	4,207,782	1.4%	15.0
Solar Water Heating	5	19	0.5%	269,965	1.2%	4,049,473	1.3%	15.0
Heat Pump	29	12	0.3%	392,149	1.8%	3,921,491	1.3%	10.0
Kitchen Ventilation	8	43	1.1%	254,466	1.1%	3,816,994	1.2%	15.0
Domestic Water Booster Packages	9	26	0.7%	247,424	1.1%	3,711,366	1.2%	15.0
Room Occupancy Sensors & Timers	1,305	36	0.9%	325,838	1.5%	1,821,022	0.6%	5.6
Refrigerator (With Recycling Of Old)	169	5	0.1%	115,420	0.5%	1,615,879	0.5%	14.0
Delamping	746	13	0.3%	85,082	0.4%	1,191,149	0.4%	14.0
Metal Halide	471	11	0.3%	79,647	0.4%	1,115,063	0.4%	14.0
LED Refrigerated Case Lighting	1,033	31	0.8%	191,122	0.9%	955,612	0.3%	5.0
CFL	1,928	28	0.7%	188,479	0.9%	611,275	0.2%	3.2
Clothes Washer	284	7	0.2%	48,682	0.2%	584,183	0.2%	12.0
T8 To T8 Low Wattage	300	7	0.2%	30,163	0.1%	452,452	0.1%	15.0
VFD Pool Pumps	13	2	0.1%	27,869	0.1%	410,670	0.1%	14.7
T12 To T8 Standard (2 Ft Lamps)	335	4	0.1%	28,990	0.1%	405,856	0.1%	14.0
Refrigerator - Bounty	31	1	0.0%	21,948	0.1%	307,268	0.1%	14.0
Cool Roof Technologies	5	10	0.3%	24,536	0.1%	245,364	0.1%	10.0
Advance Power Strips	364	3	0.1%	29,951	0.1%	149,756	0.0%	5.0
Ceiling Fans	207	3	0.1%	28,605	0.1%	143,023	0.0%	5.0

Table 45 BEEM Program Impacts								
Category	**Units**	**Program Demand (kW)**	**%**	**Program Energy (kWh First Year)**	**%**	**Program Energy (kWh - Life)**	**%**	**Average Measure Life (Years)**
Energy Star LED Dimmable w/Controls	43	1	0.0%	7,396	0.0%	88,756	0.0%	12.0
Bi-Level Lighting	1	1	0.0%	7,413	0.0%	74,131	0.0%	10.0
CEE Tier 1+ Motors	4	2	0.1%	3,482	0.0%	52,228	0.0%	15.0
Window AC	13	2	0.1%	4,036	0.0%	48,434	0.0%	12.0
Whole House Fan	2	1	0.0%	1,673	0.0%	33,451	0.0%	20.0
Freezer - Bounty	3	0	0.0%	2,135	0.0%	29,885	0.0%	14.0
Aerator	617	1	0.0%	3,709	0.0%	18,544	0.0%	5.0
T12 To T8 Standard (3 Foot Lamps)	22	0	0.0%	1,277	0.0%	17,878	0.0%	14.0
Refrigerator (Purchase New Only)	11	0	0.0%	957	0.0%	13,397	0.0%	14.0
Ice Machine (Add Size Range)	1	0	0.0%	921	0.0%	11,054	0.0%	12.0
Solar Attic Fan	3	0	0.0%	1,342	0.0%	6,710	0.0%	5.0
Showerhead	303	0	0.0%	744	0.0%	3,722	0.0%	5.0
Recycler App - Accounting	0	0	0.0%	0	0.0%	0	0.0%	0
Recycler App - Freezer	3	0	0.0%	0	0.0%	0	0.0%	0
Recycler App - Refrigerator	31	0	0.0%	0	0.0%	0	0.0%	0
Recycler App - Window AC	13	0	0.0%	0	0.0%	0	0.0%	0
Accounting	291	0	0.0%	0	0.0%	0	0.0%	0
Total	**88,071**	**3,821**	**100%**	**22,154,603**	**100%**	**308,911,319**	**100%**	**13.9**

Table 45 (cont'd) BEEM Program Impacts – *TRB, TRC & Incentives*							
Category	**TRB/TRC**	**Total Resource Benefit (TRB)**	**%**	**Total Resource Cost (TRC)**	**%**	**Incentives**	**%**
LED Lighting	4.6	$ 6,501,848	17.7%	$ 1,403,467	15.7%	$ 291,263	8.1%
Chillers	3.0	$ 5,981,784	16.3%	$ 1,961,964	21.9%	$ 472,280	13.2%
T12 To T8 Low Wattage	163.8	$ 4,557,122	12.4%	$ 27,817	0.3%	$ 379,131	10.6%
VFD - AHU	23.0	$ 4,877,760	13.3%	$ 211,934	2.4%	$ 133,713	3.7%
VFD - Chilled Water / Condenser Water	14.4	$ 2,983,869	8.1%	$ 207,825	2.3%	$ 195,600	5.5%
Variable Refrigerant Flow Air Conditioners	2.0	$ 1,917,482	5.2%	$ 943,782	10.5%	$ 585,318	16.3%
Package Units - 15% Better Than Code	6.4	$ 1,831,483	5.0%	$ 284,575	3.2%	$ 398,566	11.1%
ECM	1.7	$ 915,592	2.5%	$ 528,216	5.9%	$ 145,660	4.1%
Delamping With Reflectors	11.3	$ 881,249	2.4%	$ 78,220	0.9%	$ 38,705	1.1%
Water Cooler Timers	6.8	$ 899,424	2.4%	$ 131,400	1.5%	$ 131,400	3.7%
Window Tinting	6.5	$ 989,116	2.7%	$ 152,051	1.7%	$ 126,148	3.5%
Submetering (Condo)	1.3	$ 649,450	1.8%	$ 497,000	5.5%	$ 149,100	4.2%
Transformer	1.3	$ 387,262	1.1%	$ 291,111	3.2%	$ 62,300	1.7%
LED Exit Signs	13.4	$ 441,060	1.2%	$ 32,910	0.4%	$ 30,777	0.9%
Solar Water Heating	11.6	$ 381,955	1.0%	$ 33,000	0.4%	$ 73,017	2.0%
Heat Pump	0.3	$ 369,891	1.0%	$ 1,180,000	13.2%	$ 42,674	1.2%
Kitchen Ventilation	2.2	$ 458,638	1.2%	$ 212,400	2.4%	$ 82,600	2.3%
Domestic Water Booster Packages	2.0	$ 383,986	1.0%	$ 189,750	2.1%	$ 32,440	0.9%
Room Occupancy Sensors & Timers	12.2	$ 318,079	0.9%	$ 26,100	0.3%	$ 26,100	0.7%
Refrigerator (With Recycling Of Old)	2.4	$ 143,652	0.4%	$ 60,840	0.7%	$ 19,025	0.5%
Delamping	21.2	$ 138,100	0.4%	$ 6,504	0.1%	$ 4,065	0.1%
Metal Halide	9.3	$ 127,826	0.3%	$ 13,753	0.2%	$ 11,945	0.3%
LED Refrigerated Case Lighting	0.6	$ 137,951	0.4%	$ 250,140	2.8%	$ 62,535	1.7%
CFL	5.1	$ 87,079	0.2%	$ 17,015	0.2%	$ 5,456	0.2%
Clothes Washer	2.2	$ 69,442	0.2%	$ 31,240	0.3%	$ 14,200	0.4%
T8 To T8 Low Wattage	170.5	$ 61,380	0.2%	$ 360	0.0%	$ 5,115	0.1%
VFD Pool Pumps	2.7	$ 39,661	0.1%	$ 14,625	0.2%	$ 6,863	0.2%
T12 To T8 Standard (2 Ft Lamps)	89.2	$ 44,833	0.1%	$ 503	0.0%	$ 3,890	0.1%
Refrigerator - Bounty	14.7	$ 27,169	0.1%	$ 1,850	0.0%	$ 1,850	0.1%
Cool Roof Technologies	0.4	$ 48,956	0.1%	$ 117,712	1.3%	$ 23,542	0.7%
Advance Power Strips	2.4	$ 19,656	0.1%	$ 8,325	0.1%	$ 8,325	0.2%
Ceiling Fans	10.0	$ 18,633	0.1%	$ 1,863	0.0%	$ 7,245	0.2%

Table 45 (cont'd) **BEEM Program Impacts –** *TRB, TRC & Incentives*							
Category	**TRB/TRC**	**Total Resource Benefit (TRB)**	**%**	**Total Resource Cost (TRC)**	**%**	**Incentives**	**%**
ENERGY STAR LED Dimmable W/Controls	194.8	$ 10,052	0.0%	$ 52	0.0%	$ 430	0.0%
Bi-Level Lighting	0.4	$ 8,246	0.0%	$ 19,368	0.2%	$ 2,500	0.1%
CEE Tier 1+ Motors	14.8	$ 12,156	0.0%	$ 819	0.0%	$ 900	0.0%
Window AC	9.2	$ 10,707	0.0%	$ 1,170	0.0%	$ 650	0.0%
Whole House Fan	25.7	$ 6,166	0.0%	$ 240	0.0%	$ 150	0.0%
Freezer - Bounty	16.0	$ 2,643	0.0%	$ 165	0.0%	$ 165	0.0%
Aerator	0.9	$ 3,822	0.0%	$ 4,077	0.0%	$ 4,077	0.1%
T12 To T8 Standard (3 Foot Lamps)	62.9	$ 2,076	0.0%	$ 33	0.0%	$ 186	0.0%
Refrigerator (Purchase New Only)	0.9	$ 1,617	0.0%	$ 1,760	0.0%	$ 550	0.0%
Ice Machine (Add Size Range)	0.2	$ 1,249	0.0%	$ 5,277	0.1%	$ 100	0.0%
Solar Attic Fan	1.6	$ 711	0.0%	$ 450	0.0%	$ 150	0.0%
Showerhead	0.2	$ 1,092	0.0%	$ 5,846	0.1%	$ 5,846	0.2%
Recycler App - Accounting	0	$ 0	0.0%	$ 0	0.0%	$ 0	0.0%
Recycler App - Freezer	0	$ 0	0.0%	$ 0	0.0%	$ 90	0.0%
Recycler App - Refrigerator	0.0	$ 0	0.0%	$ 1,095	0.0%	$ 1,095	0.0%
Recycler App - Window AC	0.0	$ 0	0.0%	$ 365	0.0%	$ 365	0.0%
Accounting	0	$ 0	0.0%	$ 0	0.0%	$ -1,573	0.0%
Total	**4.1**	**$ 36,751,925**	**100%**	**$ 8,958,967**	**100%**	**$ 3,586,527**	**100%**

Expenditures

The Program distributed nearly all BEEM operation and incentive budgets due to the popularity and demand for the program's offerings. See **Table 46** for details.

Table 46
BEEM Program Expenditures

	Total Expenditures	PY14 Budget	Percent Spent	Unspent	Percent Unspent
BEEM Operations	$ 1,145,534.76	$ 1,160,000.00	98.75%	$ 14,465.24	1.25%
BEEM Incentives	$ 3,586,527.04	$ 4,159,550.00	86.22%	$ 573,022.96	13.78%
Total BEEM	**$ 4,732,061.80**	**$ 5,319,550.00**	**88.96%**	**$ 587,488.20**	**11.04%**

Customized Business Energy Efficiency Measures (CBEEM)

Objective

The objective of this program is to provide a custom application and approval process for participants to receive incentives for installing non-standard energy efficiency technologies. The commercial and industrial custom incentives enable customers to invest in energy efficiency opportunities related to manufacturing processes and other technology measures that may require calculations of energy savings on a case-by-case basis for specific, unique applications.

Custom incentives are available for all energy-savings opportunities that are not already covered by the prescribed incentives and are not limited to a certain list of measures. Some examples of custom technologies include, but are not limited to, energy management systems, exhaust ventilation control systems, high performance lighting, low-emissivity glass and HVAC controls.

Accomplishments

ENERGY STAR® LED Fixtures

Both the quality and availability of LED products continued to increase this program year. This lead to more products being listed by ENERGY STAR®, DesignLights Consortium® or Lighting Facts® and greatly increased the number and types of LED fixtures that could be installed through the CBEEM program. This contributed to the continued success of LED fixtures in the marketplace and resulted in customized LED lighting being the number one energy efficiency measure in the CBEEM program.

HVAC Equipment and Controls

In addition to LED lighting fixtures, the CBEEM program was also successful in promoting increased energy savings through advanced HVAC equipment and controls. As mentioned before, as the “low-hanging fruit” in energy efficiency is harvested it becomes increasingly difficult to produce additional savings for a facility. This is driving facility engineers to look beyond lighting to other measures that can continue improve the efficiency of their facilities. The next logical system to look at in most facilities is the mechanical HVAC system. This is leading to more advanced HVAC systems being installed when customers are looking to replace their mechanical systems. More sophisticated controls are being installed on these systems to further increase efficiency as well. The controls included Energy Management Systems that continuously monitor the performance of the system and dynamically adjust set points throughout the day to maintain optimum energy efficiency.

Impacts

For PY14, the CBEEM Program achieved savings of 25,366,309 kWh (first year) and 3,481 kW savings with $5,557,198 in incentives.

Table 47 provides a detailed breakout of the program.

- **#1 Contributor to CBEEM – LED Lighting (49.1% Lifetime kWh)**
  LED Commercial Lighting was the largest contributor to CBEEM Program savings with lifetime energy and demand savings of 143,978,318 kWh and 2,030 kW, respectively.

- **#2 Contributor to CBEEM – EMS Controls and Custom EMS Controls (22.3% Lifetime kWh)**
  Custom EMS controls were the second largest contributors to CBEEM Program savings with lifetime energy and demand savings of 65,473,723 kWh and 517 kW, respectively. (This includes EMS Controls and Custom EMS Controls.)

Table 47
CBEEM Program Impacts

Category	Units	Program Demand (kW)	%	Program Energy (kWh 1st Yr)	%	Program Energy (kWh – Life)	%	Average Measure Life (Yrs)	TRB/ TRC	Total Resource Benefit (TRB)	%	Total Resource Cost (TRC)	%	Incentives	%
LED Lighting	57,416	2,030	58.3%	14,676,354	57.9%	143,978,318	49.1%	9.8	1.1	$ 17,050,006	50.4%	$ 15,108,286	45.9%	$ 3,098,256	55.8%
EMS Controls	1,390	482	13.8%	3,883,525	15.3%	57,447,577	19.6%	14.8	1.1	$ 6,113,365	18.1%	$ 5,752,024	17.5%	$ 711,838	12.8%
Custom HVAC	640	494	14.2%	2,140,960	8.4%	32,114,393	11.0%	15.0	0.6	$ 4,352,613	12.9%	$ 7,123,483	21.6%	$ 532,813	9.6%
Chillers	2	117	3.4%	596,385	2.4%	9,616,436	3.3%	16.1	8.4	$ 1,209,238	3.6%	$ 144,000	0.4%	$ 148,071	2.7%
Building Envelope	1	40	1.2%	312,443	1.2%	9,373,290	3.2%	30.0	2.8	$ 705,510	2.1%	$ 255,362	0.8%	$ 80,962	1.5%
Custom EMS Controls	11	35	1.0%	806,282	3.2%	7,996,146	2.7%	9.9	0.4	$ 820,992	2.4%	$ 1,960,281	6.0%	$ 318,463	5.7%
Custom Controls	66	72	2.1%	742,826	2.9%	6,555,724	2.2%	8.8	1.6	$ 763,181	2.3%	$ 467,358	1.4%	$ 117,721	2.1%
Refrigeration	13	8	0.2%	582,355	2.3%	6,551,918	2.2%	11.3	1.7	$ 549,245	1.6%	$ 326,090	1.0%	$ 130,436	2.3%
Custom	5	56	1.6%	398,821	1.6%	5,444,917	1.9%	13.7	1.6	$ 623,326	1.8%	$ 386,460	1.2%	$ 80,206	1.4%
Data Centers	2	42	1.2%	364,098	1.4%	4,369,174	1.5%	12.0	1.7	$ 495,988	1.5%	$ 290,589	0.9%	$ 80,954	1.5%
Custom Lighting	6	20	0.6%	190,823	0.8%	2,584,559	0.9%	13.5	0	$ 274,925	0.8%	$ 0	0.0%	$ 37,387	0.7%
Custom VFD For Cooling Tower	4	27	0.8%	186,079	0.7%	2,462,942	0.8%	13.2	0.4	$ 293,399	0.9%	$ 726,265	2.2%	$ 48,737	0.9%
Bi-Level Lighting	3	17	0.5%	173,785	0.7%	2,114,878	0.7%	12.2	1.4	$ 226,474	0.7%	$ 158,872	0.5%	$ 33,881	0.6%
VFD Pump (Non-HVAC)	5	21	0.6%	160,846	0.6%	1,608,464	0.5%	10.0	1.9	$ 197,524	0.6%	$ 105,729	0.3%	$ 42,292	0.8%
Water Heating	634	18	0.5%	138,172	0.5%	764,630	0.3%	5.5	0.9	$ 102,987	0.3%	$ 114,064	0.3%	$ 93,209	1.7%
On-Demand Ventilation Control - AC	1	1	0.0%	12,554	0.0%	188,312	0.1%	15.0	0.7	$ 18,543	0.1%	$ 25,000	0.1%	$ 1,972	0.0%
Total	**60,199**	**3,481**	**100%**	**25,366,309**	**100%**	**293,171,679**	**100%**	**11.6**	**1.0**	**$ 33,797,316**	**100%**	**$ 32,943,863**	**100%**	**$ 5,557,198**	**100%**

Expenditures

The Program distributed nearly all CBEEM operation and incentive budgets due to the popularity and demand for the Program offerings, in particular the growth in LED lighting solutions. **See Table 48** for details.

Table 48
CBEEM Program Expenditures

	Total Expenditures	PY14 Budget	Percent Spent	Unspent	Percent Unspent
CBEEM Operations	$ 1,183,445.15	$ 1,220,000.00	97.00%	$ 36,554.85	3.00%
CBEEM Incentives	$ 5,557,198.04	$ 5,862,261.00	94.80%	$ 305,062.96	5.20%
Total CBEEM	**$ 6,740,643.19**	**$ 7,082,261.00**	**95.18%**	**$ 341,617.81**	**4.82%**

Honolulu International Airport
Honolulu, Hawaii

Working with energy performance contractor Johnson Controls, the State of Hawaii's Department of Transportation (DOT) has been making enormous upgrades to the Honolulu International Airport. For the project phases completed during PY14, DOT received $811,822 in incentives for several measures, including LED and lower-wattage lighting, chiller replacements, transformers and VFDs for pumps and air handling units.

Along with more than 5.4 million kWh in estimated annual savings, the new LEDs provide a fresh, updated look for airport parking and interior areas (pictured here) while enhancing the safety and security of the airport. The airport is also able to reinvest its incentives back to its maintenance projects for upcoming phases, like piping renewal.

Business Energy Services & Maintenance (BESM)

Objective

The objective of this program focuses on developing viable projects through collaboration, competition and direct support in the form of expertise and/or equipment (i.e. metering).

Accomplishments

Central Chiller Plant Benchmarking Program

The Central Chiller Plant Benchmarking Incentive continued in PY14. It was designed to encourage business customers to install a central chiller plant metering and data logging system that will provide real-time data and trend data. This data reflects actual tons of cooling and measured efficiency in kW per ton. Many large commercial facilities, such as hotels and multi-level office buildings, lack information to determine whether their chiller plant is running efficiently or not. The new metering equipment makes it possible for the customer to understand the current operational and performance metrics of their chiller plants and allows them to set meaningful energy efficiency goals and track progress towards those goals. Real-time and trend data is also available to engineers at Hawaii Energy via web interface, so that Hawaii Energy may increase its knowledge base and benchmark data related to typical chiller performance for various businesses on Oahu and the neighbor islands. Hawaii Energy incentivizes 100% of the equipment and installation and in turn has access to the data for five years after the project is complete. This will allow Hawaii Energy to not only benchmark performance but also track energy efficiency improvements directly influenced by data received from this program. Four projects were started and completed in PY14, with a total incentive expenditure of $285,199.

Water and Wastewater Facilities

Water and wastewater facilities are 24/7 facilities that have specific technical requirements, high capital costs and long procurement process. This targeted program continued practices started in PY13 to target water pumping systems in the plants for process improvements. The program was successful in installing comprehensive leak detection system throughout the entire water supply system on Hawaii Island that should substantially reduce the water lost through leaks, thereby reducing the combined pumping loads within the system. Lessons learned from PY13 and PY14, specifically the potentially long procurement cycle of these facilities, will be incorporated into the program in PY15 and Hawaii Energy will continue to pursue projects that we identified over the last two years.

Decision Maker: Real-Time Submeters

There are individuals within business organizations who have influence over a large number of employees whose behavior within the work environment drive unnecessary energy consumption (e.g., leaving on lights, additional electronic equipment, etc.). This offer is the direct installation of a web-based electrical metering device. This metering will be monitored by the decision maker(s) within the organization to identify usage patterns, areas of unexpected high usage and can be the basis energy efficiency upgrades, increased maintenance, or peer group competitions within the organization.

Impacts

For PY14, the BESM Program achieved energy savings of 1,205,115 lifetime kWh, from the leak detection system deployed on the Island of Hawaii. There was no demand savings for the program in PY14. Hawaii Energy expended $886,665 in incentives in this program mostly driven at encouraging future energy efficiency projects.

By the very nature of the BESM programs they do not always provide direct savings. The studies and actions are designed to set the groundwork for saving in the future. This year the one project happened to immediately catch a problem and provided saving in the first year. In relative terms, 7.2% of Hawaii Energy's business incentives ($886,665 out of $12,246,110) 2captured only 0.2% lifetime kWh, but this program reached customers that would not otherwise have participated in the energy efficiency programs. **Table 49** provides a detailed breakout of the program.

- **#1 Contributor to BESM – Water and Wastewater Facilities (100.0% Lifetime kWh)**
  The system wide leak detection system installed on the water supply system on the Island of Hawaii was the largest contributor to the BESM Program with lifetime energy savings of 1,205,115 kWh.

Table 49
BESM Program Impacts

Category	Units	Program Demand (kW)	%	Program Energy (kWh 1st Yr)	%	Program Energy (kWh – Life)	%	Average Measure Life (Years)	TRB/ TRC	Total Resource Benefit (TRB)	%	Total Resource Cost (TRC)	%	Incentives	%
Water Pumping	1	0	0%	241,023	100.0%	1,205,115	100.0%	5.0	0.3	$ 113,582	100.0%	$ 334,741	32.1%	$ 135,000	15.2%
Central Plant Benchmarking	4	0	0%	0	0.0%	0	0.0%	0	0.0	$ 0	0.0%	$ 285,199	27.3%	$ 285,199	32.2%
Custom	3	0	0%	0	0.0%	0	0.0%	0	0.0	$ 0	0.0%	$ 30,000	2.9%	$ 30,000	3.4%
Custom Controls	26	0	0%	0	0.0%	0	0.0%	0	0.0	$ 0	0.0%	$ 228,310	21.9%	$ 219,127	24.7%
Energy Study	33	0	0%	0	0.0%	0	0.0%	0	0.0	$ 0	0.0%	$ 165,000	15.8%	$ 235,489	26.6%
Accounting*	2	0	0%	0	0.0%	0	0.0%	0	0	$ 0	0.0%	$ 0	0.0%	$ -18,150	-2.0%
Total	**69**	**0**	**100%**	**241,023**	**100%**	**1,205,115**	**100%**	**5.0**	**0.1**	**$ 113,582**	**100%**	**$ 1,043,250**	**100%**	**$ 886,665**	**100%**
*Credit memos															

Expenditures

The Program had a slight surplus in the BESM incentive budget due to some BESM project completed later than expect and subsequently paid in PY15.

See **Table 50** for details.

Table 50
BESM Program Expenditures

	Total Expenditures	PY14 Budget	Percent Spent	Unspent	Percent Unspent
BESM Operations	$ 498,397.56	$ 525,000.00	94.93%	$ 26,602.44	5.07%
BESM Incentives	$ 886,665.49	$ 1,107,500.00	80.06%	$ 220,834.51	19.94%
Total BESM	**$ 1,385,063.05**	**$ 1,632,500.00**	**84.84%**	**$ 247,436.95**	**15.16%**

Business Hard-To-Reach (BHTR)

Objective

The objective of this program was to help targeted geographies and demographics that have been traditionally underserved such as retail, restaurants and other small businesses. Additionally, this program conducted more aggressive outreach to lighting and electrical contractors with training, promotional materials and frequent communications on program updates.

Accomplishments

Direct Install Restaurant Lighting Retrofit

This offering targeted restaurants and small businesses that have limited time and expertise to research lighting technology options, secure financing and hire contractors to replace their older, less efficient lighting technologies. This offering provided full energy-efficient lighting retrofits to restaurants and small businesses in Hawaii, Honolulu and Maui counties at no cost to the customer. Trade allies recruited small businesses to participate, performed audits and executed the retrofits.

This direct installation approach achieved customer level energy and demand savings of 78,370,461 lifetime energy and 717 kW, assisted by a 15% contractor bonus that Hawaii Energy instituted in the latter half of the program year to raise the importance of these projects in the Contractor's priority list. At $0.35 per kWh this is a $27,428,407 in lifetime energy cost reduction for the businesses!

Earlier in the program year it was determined that a substantial number of very large lighting projects, such as the Honolulu International Airport, had inundated local lighting contractors. Electrical contractors that traditionally focus on lighting projects were all busy with very large lighting projects, leaving only electrical contractors that use lighting projects as "fill" work when they are not working on other electrical jobs. This was causing a lag in the SBDIL program. To counteract this lag, Hawaii Energy introduced a 15% contractor bonus for any SBDIL project initiated and completed in the latter half of the year. This bonus was successful in getting the attention of some of the contractors that were less busy and allowed the program to reach its goal.

Eggs 'N Things
Honolulu, Hawaii

Popular Waikiki breakfast joint Eggs 'N Things was one of many businesses that received a free lighting retrofit through the Hawaii Energy Small Business Direct Install Lighting program this year. Eggs 'N Things upgraded to LEDs throughout their two-story dining and retail area as well as in their offices and restrooms. In addition to saving more than $3,400 in energy costs over the first year, the new lighting provides better visibility and a cooler ambiance for their customers and staff.

Impacts

For PY14, the BHTR Program achieved savings of 89,446,256 lifetime kWh and 1,112 kW savings with $2,215,720 in incentives. **Table 51** provides the detailed measures contributing to this program.

Table 51
BHTR Program Impacts

Category	Units	Program Demand (kW)	%	Program Energy (kWh 1st Yr)	%	Program Energy (kWh – Life)	%	Average Measure Life (Years)	TRB/ TRC	Total Resource Benefit (TRB)	%	Total Resource Cost (TRC)	%	Incentives	%
T12 To T8 Low Wattage	15,832	468	42.1%	3,385,075	49.4%	47,391,056	53.0%	14.0	4.0	$ 5,414,212	51.9%	$ 1,338,688	62.5%	$ 1,338,688	60.4%
LED Lighting	11,034	253	22.8%	1,863,121	27.2%	26,083,692	29.2%	14.0	5.8	$ 2,964,686	28.4%	$ 510,340	23.8%	$ 510,340	23.0%
Custom Lighting	2,436	33	2.9%	618,551	9.0%	8,659,709	9.7%	14.0	5.7	$ 795,291	7.6%	$ 140,757	6.6%	$ 140,757	6.4%
Low-Flow Spray Rinse Nozzles	381	326	29.4%	715,864	10.5%	3,579,318	4.0%	5.0	88.6	$ 844,353	8.1%	$ 9,525	0.4%	$ 10,530	0.5%
T12 To T8 Standard (2 Ft Lamps)	829	13	1.2%	149,666	2.2%	2,095,319	2.3%	14.0	2.8	$ 211,536	2.0%	$ 74,633	3.5%	$ 74,633	3.4%
CFL	424	13	1.1%	83,098	1.2%	1,163,368	1.3%	14.0	24.4	$ 136,673	1.3%	$ 5,603	0.3%	$ 5,603	0.3%
LED Refrigerated Case Lighting	149	5	0.4%	23,283	0.3%	325,955	0.4%	14.0	1.0	$ 42,075	0.4%	$ 42,541	2.0%	$ 42,541	1.9%
LED Exit Signs	34	1	0.1%	9,341	0.1%	130,768	0.1%	14.0	15.4	$ 13,767	0.1%	$ 894	0.0%	$ 894	0.0%
Reach-In Refrigerator Solid Door	3	0	0.0%	1,423	0.0%	17,072	0.0%	12.0	0.2	$ 1,929	0.0%	$ 9,217	0.4%	$ 850	0.0%
Accounting	22	0	0.0%	0	0.0%	0	0.0%	0	0	$ 0	0.0%	$ 0	0.0%	$ 2,100	0.1%
Contractor Reward (SBDIL)	0	0	0.0%	0	0.0%	0	0.0%	0	0	$ 0	0.0%	$ 0	0.0%	$ 77,727	3.5%
Installation Cost - Ladders	2,191	0	0.0%	0	0.0%	0	0.0%	0	0.0	$ 0	0.0%	$ 11,058	0.5%	$ 11,058	0.5%
Total	**33,335**	**1,112**	**100%**	**6,849,420**	**100%**	**89,446,256**	**100%**	**13.1**	**4.9**	**$ 10,424,522**	**100%**	**$ 2,143,255**	**100%**	**$ 2,215,720**	**100%**

Small Business Direct Install Lighting Program – Customer-Level Impacts

Customers participating in the SBDIL program should save over $1,959,172 in operating expenses per year. Over the life of the lighting measures installed, the customers are expected to save $27,428,407. This is money that they can invest into their business, driving more job growth and profitability. See **Table 52** for further details.

Table 52
SBDIL Customer Level Impacts by Island

	Hawaii	Lanai	Maui	Molokai	Oahu	Total	Program Cost/ kWh
SBDIL – Lighting Retrofits							
Customers	55	2	51	0	350	458	
Measures	320	16	234	0	1,527	2,097	
kW Reduction	118	0	37	0	361	515	
kWh - First Year	890,006	26,221	346,745	0	2,886,775	4,149,748	**$ 0.408**
kWh - Life	12,460,087	367,100	4,854,435	0	40,414,852	58,096,474	**$ 0.029**
Incentives	$ 271,292	$ 27,808	$ 129,532	$ 0	$ 1,265,157	$ 1,693,789	
SBDIL – Restaurant Lighting							
Customers	13	0	4	0	95	112	
Measures	80	0	34	0	467	581	
kW Reduction	32	0	9	0	161	202	
kWh - First Year	188,278	0	89,569	0	1,170,295	1,448,142	**$ 0.298**
kWh - Life	2,635,890	0	1,253,962	0	16,384,135	20,273,986	**$ 0.021**
Incentives	$ 46,668	$ 0	$ 24,124	$ 0	$ 360,177	$ 430,969	
Total							
Customers	68	2	55	0	445	570	
Measures	400	16	268	0	1,994	2,678	
kW Reduction	150	0	46	0	522	717	
kWh - First Year	1,078,284	26,221	436,314	0	4,057,071	5,597,890	**$ 0.380**
kWh - Life	15,095,976	367,100	6,108,397	0	56,798,987	78,370,461	**$ 0.027**
Incentives	$ 317,960	$ 27,808	$ 153,656	$ 0	$ 1,625,334	$ 2,124,758	
Financial Benefits							
Average "G" Rate	$ 0.478	$ 0.530	$ 0.403	$ 0.000	$ 0.338	$ 0.350	
Annual Savings	$ 515,948	$ 13,885	$ 176,044	$ 0	$ 1,373,075	$ 1,959,172	
Lifetime Savings	$ 7,223,274	$ 194,383	$ 2,464,616	$ 0	$ 19,223,049	$ 27,428,407	
Simple Payback (years)	0.6	2.0	0.9	0	1.2	1.1	
IRR	162%	50%	115%	0%	84%	92%	

Expenditures

The Program distributed nearly all BHTR operation and incentive funds due to the popularity and demand for the Program offerings, in particular the limited time Contractor Bonus contributed significantly to the success of the program in PY14.

See **Table 53** for details.

Table 53
BHTR Program Expenditures

	Total Expenditures	PY14 Budget	Percent Spent	Unspent	Percent Unspent
BHTR Operations	$ 610,986.36	$ 616,130.00	99.17%	$ 5,143.64	0.83%
BHTR Incentives	$ 2,215,719.66	$ 2,390,270.00	92.70%	$ 174,550.34	7.30%
Total BHTR	**$ 2,826,706.02**	**$ 3,006,400.00**	**94.02%**	**$ 179,693.98**	**5.98%**

RESIDENTIAL PROGRAM

Overall Impacts

Impacts

For PY14, Hawaii Energy's Residential program achieved savings of 61,971,862 kWh (first year), 499,037,203 lifetime kWh energy savings and 10,083 kW savings with $9,978,127 in incentives. In relative terms, 45% of Hawaii Energy's incentives ($9,978,127 out of $22,224,237 in direct incentives) captured 42% of lifetime kWh (499,037,203 out of 1,191,771,572) and 10,083 kW savings, respectively. See **Table 54**.

Table 54
Residential Program Impacts Summary

Category	Units	Program Demand (kW)	%	Program Energy (kWh 1st Year)	%	Program Energy (kWh - Life)	%	Average Measure Life (Years)	TRB/ TRC	Total Resource Benefit (TRB)	%	Total Resource Cost (TRC)	%	Incentives	%
REEM	3,358,298	9,874	97.9%	60,733,605	98.0%	489,452,081	98.1%	8.1	2.7	$ 62,521,017	98.1%	$ 23,034,782	95.0%	$ 9,011,161	90.3%
RESM	1,775	50	0.5%	631,896	1.0%	5,169,866	1.0%	8.2	0.9	$ 512,543	0.8%	$ 555,900	2.3%	$ 301,350	3.0%
RHTR	21,200	159	1.6%	606,361	1.0%	4,415,256	0.9%	7.3	1.1	$ 699,700	1.1%	$ 661,866	2.7%	$ 664,297	6.7%
CESH	1	0	0.0%	0	0.0%	0	0.0%	0	0.0	$ 0	0.0%	$ 1,319	0.0%	$ 1,319	0.0%
Total	**3,381,274**	**10,083**	**100%**	**61,971,862**	**100%**	**499,037,203**	**100%**	**8.1**	**2.6**	**$ 63,733,260**	**100%**	**$ 24,253,867**	**100%**	**$ 9,978,127**	**100%**

Highlights

Hawaii Energy launched an online store and the Multifamily Direct Install Program as part of its continued efforts to make simple energy-efficient products more readily accessible to residential utility customers. Both these programs sought to overcome longstanding barriers to install by providing customers with new purchase and delivery mechanisms.

The EnerNOC Potential Study identified residential water heating as the highest potential area for future PBFA investment. This year, the Program implemented water measures like low-flow showerheads and faucet aerators as we sought to address additional energy saving opportunities. Through these initiatives, Hawaii Energy was also able to collect key occupancy and water heating data in order to better evaluate overall energy savings impact. Additional details are highlighted below.

Hawaii Energy Online Store: Energy-Saving Kits

In April 2015, Hawaii Energy launched its first-ever online store. Customers were able to order one basic energy-saving kit and one advanced energy saving kit, with direct delivery to their home. The basic kit was free to customers and included one CFL lamp, one LED lamp, one low-flow showerhead and one faucet aerator. The advanced kit had a $10 customer co-pay and included two LED lamps and one advanced power strip. The advanced kit was offered to provide interested customers with additional energy saving technologies. Through this effort, Hawaii Energy also collected specific water heating and occupancy data in order to more accurately calculate the energy savings potential.

The online sale lasted six weeks, during which time a total of 4,953 kits were ordered. The success of this pilot far surpassed initial expectations by almost doubling the original target of 2,500 kits. The program initiated some key online marketing initiatives that we believe helped drive customer traffic to the store. In particular, our social media campaign resulted in 339 conversions, approximately 10% of 3,394 unique orders.

Basic Kit Sales		
Island	**# of Kits**	**% of Total Basic**
Oahu	2,160	63.6%
Hawaii Island	935	27.5%
Maui	285	8.4%
Molokai	11	0.3%
Lanai	3	0.1%
Total Kits	**3,394**	**100%**

Advanced Kit Sales		
Island	**# of Kits**	**% of Total Advanced**
Oahu	949	60.9%
Hawaii Island	473	30.3%
Maui	131	8.4%
Molokai	5	0.3%
Lanai	1	0.1%
Total Kits	**1,559**	**100%**

Multifamily Direct Install Program

PY14 marked the expansion into another facet of direct install opportunities through the introduction of the Energy $mart 4 Homes (E$4H) program for multifamily residential properties. E$4H targeted an underserved portion of the multifamily market, including master-metered and rental units. E$4H provided turnkey delivery of in-unit energy-saving measures, including high-efficiency lighting, high-efficiency showerheads, faucet aerators and advanced power strips. Thirty-three multifamily properties participated during PY14 with a total of 1,524 tenant units serviced. This total was comprised of 1,150 tenant units that fell under residential rate codes and 374 units that were part of commercial master-metered buildings.

The Energy $mart 4 Homes program delivers energy-efficient equipment, free of charge, directly to customers' homes and eliminates the need for self-installation. Many of the homes serviced in in PY14 were rental units (pictured above), a type of home where energy-saving improvements can typically be limited.

Overall Expenditures

Expenditures

In PY14 the program successfully distributed 90.2% of residential incentive funds reaching 87.6% of the first year kWh target and savings target. The year ended with a total incentive spend of $9,978,127 leaving a surplus of $1,083,348. The surplus was due in part to unspent funds originally allocated for the PY14 Energy Efficiency Auction and the Residential Hard-to-Reach direct install efforts.

Residential Energy Efficiency Measures (REEM), which represents the backbone of the residential portfolio, utilized 96.8% of its budget.* Residential Energy Services & Maintenance (RESM) was also particularly successful this year as the Solar Water Heating Tune-Up program once again surpassed initial targets. This year the budget for Customized Energy Solutions for the Home (CESH) was reserved for the Energy Efficiency Auction project, which faced limitations in execution due to timing constraints. Thus, CESH played a minimal role in overall expenditures.

As previously mentioned, the Residential Hard-to-Reach program saw an exciting expansion with the implementation of the Multifamily Direct Install program. Additionally, Hawaii Energy funded the direct install of 70 solar water heating (SWH) systems on Hawaii Island. Despite a year of significant program activity, the Residential Hard-to-Reach budget closed PY14 with a $397k or 37% surplus. This was largely due to lower costs associated with the SWH direct install efforts. See **Table 55** for final budget allocations and spend details.

**Percent spent based on final budget allocations.*

Table 55 Residential Program Expenditures					
	Total Expenditures	**PY14 Budget**	**Percent Spent**	**Unspent**	**Percent Unspent**
Residential Programs					
Operations and Management					
REEM	$ 2,325,000.47	$ 2,326,000.00	99.96%	$ 999.53	0.04%
CESH	$ 52,086.66	$ 53,000.00	98.28%	$ 913.34	1.72%
RESM	$ 48,953.55	$ 49,000.00	99.91%	$ 46.45	0.09%
RHTR	$ 407,446.45	$ 408,000.00	99.86%	$ 553.55	0.14%
Total Residential Programs	$ 2,833,487.13	$ 2,836,000.00	99.91%	$ 2,512.87	0.09%
Residential Evaluation	$ 160,747.08	$ 163,561.00	98.28%	$ 2,813.92	1.72%
Residential Outreach	$ 670,442.17	$ 675,000.00	99.32%	$ 4,557.83	0.68%
Total Residential Non-Incentives	**$ 3,664,676.38**	**$ 3,674,561.00**	**99.73%**	**$ 9,884.62**	**0.27%**
Residential Incentives					
REEM	$ 9,011,160.99	$ 9,312,683.00	96.76%	$ 301,522.01	3.24%
CESH	$ 1,319.08	$ 277,542.00	0.48%	$ 276,222.92	99.52%
RESM	$ 301,350.00	$ 410,000.00	73.50%	$ 108,650.00	26.50%
RHTR	$ 664,296.93	$ 1,061,250.00	62.60%	$ 396,953.07	37.40%
Subtotal Residential Incentives	$ 9,978,127.00	$ 11,061,475.00	90.21%	$ 1,083,348.00	9.79%
Residential Transformational	$ 1,684,719.01	$ 1,747,514.00	96.41%	$ 62,794.99	3.59%
Total Residential Incentives	**$ 11,662,846.01**	**$ 12,808,989.00**	**91.05%**	**$ 1,146,142.99**	**8.95%**
Total Residential Programs	**$ 15,327,522.39**	**$ 16,483,550.00**	**92.99%**	**$ 1,156,027.61**	**7.01%**

Residential Trade Allies

Background

The residential trade allies include product manufacturers, wholesalers, retailers and contractors. These companies range from global entities to local proprietorships and all play a vital role in the Program's success. Some are on the front lines selling energy-efficient products, while others are behind the scenes delivering appliances and recycling those which have been replaced. In all, Hawaii Energy continued to enjoy the support of almost 200 unique companies that play a role in driving energy efficiency in the residential market. Moreover, a number of these trade allies have furthered their participation with Hawaii Energy by signing on as Clean Energy Allies, a program initiated in PY14 (see Transformational section, pg. 146). See **Table 56** for additional details on trade ally activity.

Trade Ally Program Outreach and Feedback

Hawaii Energy solicits feedback on a daily basis when contractors call in for work orders, or when the Program delivers applications to retailers. Program communications continue to expand through tailored delivery methods for participants, in order to reach the target recipient in the most effective manner. The launch of Hawaii Energy's Web 3.0 and the Clean Energy Ally program further encourages participant self-service and the use of web tools. In addition, the Program continues to send direct emails, utilize standard USPS letter mailings, and reach out to authorized principals/points of contact via phone. In PY14, Program representatives engaged in multiple retail and commercial events with our partners in order to spread the word about Hawaii Energy offerings. This multifaceted approach ensures we can modify programs proactively and respond to ally needs without delays.

Ongoing Quality Assistance

In PY14, the Residential program continued to enhance the quality of programs offered through trade allies. In particular, the Program presented performance summaries to managers of key retail stores participating in the ENERGY STAR® appliance programs. These presentations encouraged feedback and helped staff better understand their overall performance compared to previous years. Feedback collected during these sessions was utilized to implement updates to both the Refrigerator and Window AC trade-up programs in order to better serve customer needs.

Table 56 Residential Trade Ally Projects						
Trade Allies	**Measures**	**Customer Level Demand Savings (kW)**	**Customer Level Energy Savings (kWh 1st Yr.)**	**Customer Level Energy Savings (kWh - Life)**	**Cumulative Customer Level Energy Savings (%)**	**Incentives**
Costco	666,629	2,372	17,322,289	156,778,053	27.5 %	$ 1,789,963
Home Depot	585,020	2,266	17,337,491	134,010,115	23.5 %	$ 1,441,658
Longs/Cvs	285,796	1,143	8,802,517	52,815,101	9.3 %	$ 493,890
City Mill	131,923	497	3,673,818	28,739,758	5.0 %	$ 334,136
Sears	2,649	107	1,376,971	18,386,754	3.2 %	$ 214,975
Lowes	27,549	166	1,440,605	16,118,500	2.8 %	$ 220,048
Other	18,812	115	1,443,694	14,082,603	2.5 %	$ 1,379,354
Walmart	55,642	223	1,713,774	10,282,642	1.8 %	$ 52,860
Island Cooling LLC	389	194	389,241	7,768,620	1.4 %	$ 29,125
Opower	1,476,250	2,242	6,595,222	6,595,222	1.2 %	$ 505,276
Alternate Energy - Oahu	212	96	431,585	6,473,775	1.1 %	$ 208,700
The Light Bulb Source	20,793	62	413,781	6,206,711	1.1 %	$ 126,358
Sams Club	29,947	117	888,872	5,883,606	1.0 %	$ 44,732
Alternate Energy	643	187	378,167	5,610,990	1.0 %	$ 108,700
Ponchos Solar Service - Oahu	163	75	336,595	5,048,925	0.9 %	$ 163,000
Techniart Inc	12	277	658,897	4,819,232	0.8 %	$ 128,348
Solar Help Hawaii	155	69	310,385	4,628,775	0.8 %	$ 149,150
Remaining Allies	78,690	1,334	7,331,561	86,130,749	15.1 %	$ 2,587,854
Residential Program Totals	**3,381,274**	**11,541**	**70,845,465**	**570,380,130**	**100.0 %**	**$ 9,978,127**

Residential Energy Efficiency Measures (REEM)

Objectives

This program consisted of five major initiatives including:

- High-Efficiency Water Heating
- High-Efficiency Lighting
- High-Efficiency Air Conditioning
- High-Efficiency Appliances
- Energy Efficiency Equipment Kits
- Energy Awareness, Measurement and Controls Systems

Rounding out the top three initiatives for first year kWh savings were CFLs, LEDs and Peer Group Comparisons. The largest offer, CFLs, was administered through indirect upstream incentives to customers via lighting distributors and manufacturers. Second to the CFL offering was LEDs, also administered through upstream incentives, which saw a unit increase of over 183% from PY13. The Peer Group Comparison program was the third largest offer in PY14, delivering Home Energy Reports to a total of 132,500 households on Oahu, Maui and Hawaii Island.

Although the top three initiatives for PY14 are similar to those in PY13, there was a noticeable increase in LED counts, moving up from #3 in PY13 to #2 this year. We expect this will continue to gain momentum in the following program years as well. LED technology has moved to the forefront of the Program with the number of LED product SKU's on the market more than tripling over the last program year. New products have reduced wattages with higher lumen output and we are continuing to see falling price points, allowing LEDs to be more cost competitive. Moreover, there have been product enhancements to the A-line omnidirectional bulbs which allow the full feature and benefit of a true 360-degree light output.

Impacts

For PY14, the REEM program achieved savings of 489,452,081 lifetime kWh and 9,874 kW savings with $9,011,161 in incentives.

As for many years the CFL and now LED programs dominate the program savings. In relative terms, three measures (CFLs, LEDs and Solar Water Heating) totaling 67% of REEM program incentives captured 79% first year kWh and 68% kW savings. See **Table 57** for details.

The three largest contributors to REEM program savings were:

- **#1 Contributor to REEM – CFLs (43.8% Lifetime kWh)**

  CFLs were the largest contributor to the REEM Program savings with lifetime energy and demand savings of 214,598,569 kWh and 4,645 kW, respectively. Much like PY13, reliance on CFLs continues to drop. CFLs accounted for 58.9% of REEM first year energy savings, down from 70.7% in PY13. The overall unit count of CFLs decreased by 170,000 from PY13 and was also coupled with a reduction in deemed savings per unit.

- **#2 Contributor to REEM – LEDs (28.1% Lifetime kWh)**

  LEDs were the second largest contributor to the REEM Program savings with lifetime energy and demand savings of 137,557,116 kWh and 1,382 kW, respectively. This performance was an increase in first year savings of over 220% from PY13. Moreover, with a measure life of 15 years, LEDs contribute over 28% of REEM lifetime energy savings.

- **#3 Contributor to REEM – Solar Water Heating (9.3% Lifetime kWh)**

  The Solar Water Heating program was the third largest contributor to the REEM Program savings with lifetime energy and demand savings of 45,732,046 kWh and 679 kW, respectively. In PY14, there were a total of 1,776 systems installed through the program.

Table 57 REEM Program Impacts															
Category	**Units**	**Program Demand (kW)**	**%**	**Program Energy (kWh 1st Year)**	**%**	**Program Energy (kWh - Life)**	**%**	**Average Measure Life (Yrs)**	**TRB/ TRC**	**Total Resource Benefit (TRB)**	**%**	**Total Resource Cost (TRC)**	**%**	**Incentives**	**%**
CFL*	1,328,146	4,645	47.0%	35,766,428	58.9%	214,598,569	43.8%	6.0	14.3	$ 28,454,247	45.5%	$ 1,992,219	8.6%	$ 1,694,358	18.8%
LED Lighting	527,905	1,382	14.0%	9,170,478	15.1%	137,557,166	28.1%	15.0	3.1	$ 15,820,407	25.3%	$ 5,147,074	22.3%	$ 2,689,028	29.8%
Solar Water Heating	1,689	679	6.9%	3,048,803	5.0%	45,732,046	9.3%	15.0	0.5	$ 6,103,915	9.8%	$ 11,147,400	48.4%	$ 1,680,200	18.6%
Refrigerator (With Recycling Of Old)	3,482	104	1.0%	2,503,345	4.1%	35,046,834	7.2%	14.0	2.5	$ 3,114,549	5.0%	$ 1,253,520	5.4%	$ 386,900	4.3%
Variable Refrigerant Flow Air Conditioners	1,636	422	4.3%	844,897	1.4%	12,673,455	2.6%	15.0	4.4	$ 2,592,225	4.1%	$ 582,993	2.5%	$ 290,900	3.2%
Clothes Washer	3,816	93	0.9%	687,720	1.1%	8,252,645	1.7%	12.0	2.3	$ 980,685	1.6%	$ 419,760	1.8%	$ 190,800	2.1%
Refrigerator - Bounty	755	22	0.2%	565,682	0.9%	7,919,548	1.6%	14.0	16.5	$ 700,408	1.1%	$ 42,355	0.2%	$ 42,355	0.5%
Whole House Fan	399	175	1.8%	351,384	0.6%	7,027,685	1.4%	20.0	27.1	$ 1,295,220	2.1%	$ 47,880	0.2%	$ 29,925	0.3%
Peer Group Comparison - Phase 1/2/3	1,476,265	1,957	19.8%	5,756,406	9.5%	5,756,406	1.2%	1.0	0.9	$ 1,351,980	2.2%	$ 1,507,538	6.5%	$ 1,507,538	16.7%
Home Energy-Saving Kits-Online Fulfillment	12	242	2.4%	574,934	0.9%	4,205,051	0.9%	7.3	6.1	$ 785,128	1.3%	$ 128,348	0.6%	$ 128,348	1.4%
Heat Pump	185	34	0.3%	243,108	0.4%	2,431,083	0.5%	10.0	0.9	$ 304,228	0.5%	$ 333,000	1.4%	$ 37,000	0.4%
Ceiling Fans	2,901	48	0.5%	423,400	0.7%	2,117,000	0.4%	5.0	10.6	$ 276,355	0.4%	$ 26,109	0.1%	$ 101,535	1.1%
Water Cooler Timers	6,296	0	0.0%	281,310	0.5%	1,406,552	0.3%	5.0	1.5	$ 137,299	0.2%	$ 94,440	0.4%	$ 94,440	1.0%
Freezer - Bounty	109	3	0.0%	81,682	0.1%	1,143,551	0.2%	14.0	16.6	$ 101,136	0.2%	$ 6,095	0.0%	$ 6,095	0.1%
Window AC	282	47	0.5%	92,284	0.2%	1,107,409	0.2%	12.0	9.6	$ 244,794	0.4%	$ 25,380	0.1%	$ 14,100	0.2%
VFD Pool Pumps	209	1	0.0%	109,178	0.2%	1,091,783	0.2%	10.0	0.8	$ 96,204	0.2%	$ 125,400	0.5%	$ 31,350	0.3%
Solar Attic Fan	265	5	0.0%	125,421	0.2%	627,106	0.1%	5.0	1.7	$ 66,381	0.1%	$ 39,750	0.2%	$ 13,250	0.1%
Advance Power Strips	2,413	9	0.1%	82,189	0.1%	410,946	0.1%	5.0	2.6	$ 53,892	0.1%	$ 20,502	0.1%	$ 20,565	0.2%
Refrigerator (Purchase New Only)	269	4	0.0%	24,720	0.0%	346,080	0.1%	14.0	1.0	$ 41,811	0.1%	$ 43,040	0.2%	$ 13,450	0.1%
Solar Water Heating Tune-Up	1	0	0.0%	233	0.0%	1,165	0.0%	5.0	0.5	$ 153	0.0%	$ 300	0.0%	$ 150	0.0%
Recycler App - Freezer	111	0	0.0%	0	0.0%	0	0.0%	0	0.0	$ 0	0.0%	$ 16,320	0.1%	$ 3,515	0.0%
Recycler App - Refrigerator	750	0	0.0%	0	0.0%	0	0.0%	0	0.0	$ 0	0.0%	$ 23,765	0.1%	$ 23,765	0.3%
Recycler App - Window AC	303	0	0.0%	0	0.0%	0	0.0%	0	0.0	$ 0	0.0%	$ 8,095	0.0%	$ 8,095	0.1%
Custom Water Heater	7	0	0.0%	0	0.0%	0	0.0%	0	0.0	$ 0	0.0%	$ 3,500	0.0%	$ 3,500	0.0%
Recycler App - Accounting	0	0	0.0%	0	0.0%	0	0.0%	0	0	$ 0	0.0%	$ 0	0.0%	$ 0	0.0%
Accounting	5	0	0.0%	0	0.0%	0	0.0%	0	0	$ 0	0.0%	$ 0	0.0%	$ 0	0.0%
Total	**3,358,211**	**9,874**	**100%**	**60,733,605**	**100%**	**489,452,081**	**100%**	**8.1**	**2.7**	**$ 62,521,017**	**100%**	**$ 23,034,782**	**100%**	**$ 9,011,161**	**100%**

*Includes 50 unit (lamps) over-count from single distributor across two counties

Expenditures

In PY14, the Program utilized 96.8% of available incentive funds, realizing a small surplus of $301,522.* See **Table 58** for details.

*Percent spent based on final budget allocations.

Table 58
REEM Program Expenditures

	Total Expenditures	PY14 Budget	Percent Spent	Unspent	Percent Unspent
REEM Operations	$ 2,325,000.47	$ 2,326,000.00	99.96%	$ 999.53	0.04%
REEM Incentives	$ 9,011,160.99	$ 9,312,683.00	96.76%	$ 301,522.01	3.24%
Total REEM	**$ 11,336,161.46**	**$ 11,638,683.00**	**97.40%**	**$ 302,521.54**	**2.60%**

Accomplishments

Popular Offerings

Figure 7 summarizes the participation of REEM incentives by measure.

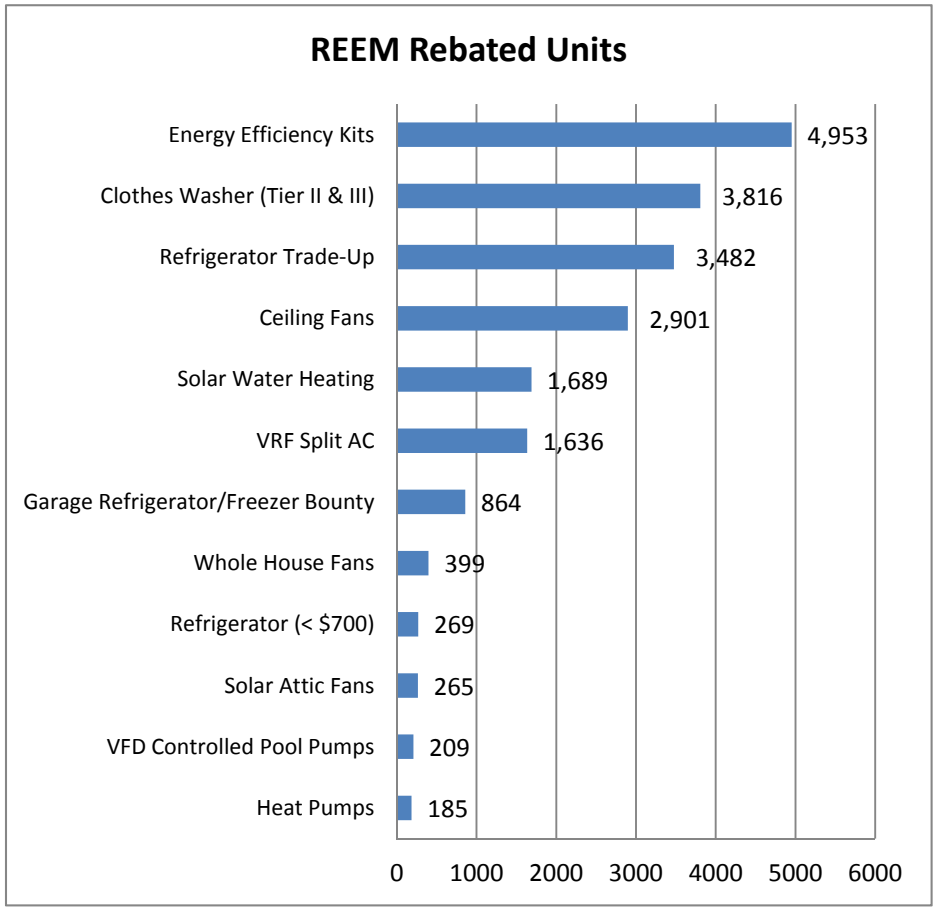
Quality Customer Support

During PY14, Hawaii Energy's residential call center handled over 14,649 customer calls ranging from, "What kind of refrigerator should I buy?" to, "What is the difference in solar technologies offered to heat to my water?" and "What can we do to lower our monthly utility bill?" We saw that 670 of the customers who called were concerned about their energy usage related to the Peer Group Comparison Report. Less than 1% opted out of the report and most were pleased and very interested in looking at decreasing their usage. The call center team was able to manage the coverage of these calls while maintaining an eight-second average answer rate with less than a 1.1% abandonment rate for all customer calls.

Customer Experience Management

The Program continued to successfully utilize its Customer Experience Management tool, Medallia, for a fifth year. This software generates an automated customer email survey for the ENERGY STAR® rebate and Solar Water Heating program participants. In PY14, the Program sent out over 7,865 surveys to gauge customer experience with Hawaii Energy. With a response rate of over 33%, the overall satisfaction rating averaged 9.1 out of 10 in the areas of field service, rebate satisfaction and willingness to recommend Hawaii Energy offerings. In PY14, Hawaii Energy logged only nine complaints, which is up slightly from six complaints in PY13. For the most part, complaints revolved around customer perception issues and at the end of the calls the customers left with a better understanding of the Program's value.

Figure 7



Accomplishments by Measure Offering

High-Efficiency Water Heating (HEWH)

For PY14, the HEWH program achieved a savings of 48,163,130 lifetime kWh and 713 kW savings with $1,717,200 in incentives.

- Solar Water Heating (SWH) Instant Rebate and Interest Buy-Down Program – With 1,689 solar thermal systems installed and incentivized either directly or through participating lenders, the Program saw a steady performance in PY14. Solar water heating was the fourth largest contributor to the REEM Program savings with lifetime energy and demand savings of 45,732,046 kWh and 679 kW, respectively. At the close of the year, the Program had 71 participating contractors.

  The solar interest buy-down option, known as "Hot Water, Cool Rates," continued to remain a selling tool for the Program's participating contractors, however, when given the option, customers typically opt for a no-financing solution. Additionally, the popularity of photovoltaics (PV), despite the recommended loading order (i.e., solar water heating first, PV second), continues to overshadow the potential of solar water heating.

- Solar Water Heating Inspections – 85% of installations were inspected in PY14. The Program uses an algorithm to select systems to be inspected based on a number of factors including first-pass rates, although inspections were also conducted on an as-requested basis. This has helped to lower administration costs, while not sacrificing quality.

- Heat Pump Water Heaters reached 62% of target with 185 units rebated. Although this represents a slight decrease from PY13, this technology still represents as a viable option for smaller households. Hawaii Energy is working with retail locations to increase the availability of heat pumps and will also be piloting a new heat pump program specifically for multifamily properties during PY15. See **Table 59** for details of the High-Efficiency Water Heating offers.

- Participating Contractor Meetings – Hawaii Energy continued to meet with its network of Participating Contractors on Oahu, Maui and Hawaii islands. These half-day sessions provided a forum to update contractors on program results, review offerings like the Solar Water Heating Tune-Up and give an opportunity for honest and open dialogue aimed to improve the Program. This year, the agenda included all of the Program's residential offerings and the upcoming On-Bill Financing programs.

Table 59
REEM High Efficiency Water Heating Program Impacts

Category	Units	Program Demand (kW)	%	Program Energy (kWh 1st Yr.)	%	Program Energy (kWh - Life)	%	Average Measure Life (Yrs)	TRB/ TRC	Total Resource Benefit	%	Total Resource Cost ($)	%	Incentives	%
Solar Water Heating	1,689	679	95.2%	3,048,803	92.6%	45,732,046	95.0%	15.0	0.5	$ 6,103,915	95.3%	$ 11,147,400	97.1%	$ 1,680,200	97.8%
Heat Pump	185	34	4.8%	243,108	7.4%	2,431,083	5.0%	10.0	0.9	$ 304,228	4.7%	$ 333,000	2.9%	$ 37,000	2.2%
Total	**1,874**	**713**	**100%**	**3,291,911**	**100%**	**48,163,130**	**100%**	**14.6**	**0.6**	**$ 6,408,143**	**100%**	**$ 11,480,400**	**100%**	**$ 1,717,200**	**100%**

See **Table 60** for details on solar water heating systems installed by island and **Table 61** for solar water heating system installations listed by participating contractor.

Table 60 Solar Water Heating System Installations by County									
Category	**Units**	**Program Demand (kW)**	**%**	**Program Energy (kWh 1st yr.)**	**%**	**Lifetime Energy (kWh)**	**%**	**Incentives $**	**%**
Hawaii	235	118	16%	535,451	16%	8,031,768	16%	759,324	32%
Lanai	3	1	0%	5,362	0%	80,429	0%	3,000	0%
Maui	300	133	18%	612,273	18%	9,184,102	18%	373,802	16%
Oahu	1,151	473	65%	2,288,706	66%	34,330,594	66%	1,205,566	51%
Total	**1,689**	**726**	**100%**	**3,441,793**	**100%**	**51,626,893**	**100%**	**2,341,692**	**100%**

Table 61 Solar Water Heating System Installations by Participating Contractor					
	Contractor	**% Total**		**Contractor**	**% Total**
1	Alternate Energy – Oahu	13.37%	26	Hawaiian Energy Systems, Inc.	0.60%
2	Poncho's Solar Service – Oahu	9.53%	27	Apollo Solar	0.54%
3	Solar Help Hawaii	8.87%	28	Hawaiian Island Solar, Inc.	0.54%
4	Haleakala Solar – Oahu	7.73%	29	Solar Aide Company	0.42%
5	Haleakala Solar, Inc. – Maui	6.18%	30	Commercial Plumbing, Inc.	0.36%
6	Hawaiian Solar & Plumbing	5.28%	31	Risource Energy Renewable Systems, LLC	0.36%
7	C&J Solar Solutions	4.50%	32	Perrin Plumbing, LLC	0.24%
8	Drainpipe Plumbing & Solar	4.26%	33	Poncho's Solar Service – Maui	0.24%
9	HI-Power Solar, LLC	4.26%	34	Built to Last Plumbing	0.18%
10	Sonshine Solar Corp.	3.78%	35	Giant Solar, LLC DBA Giant Energy	0.18%
11	Maui Pacific Solar, Inc.	3.54%	36	Knight's Plumbing, Inc.	0.18%
12	Keith Shigehara Plumbing, Inc.	3.42%	37	Sedna Aire Hawaii	0.18%
13	Energy Unlimited, Inc.	2.88%	38	21st Century Technologies HI – Oahu	0.12%
14	Affordable Solar Contracting	2.52%	39	Allen's Plumbing – Oahu	0.12%
15	True Green Solar, LLC	2.28%	40	Alternate Energy – Maui	0.12%
16	Grand Solar	2.22%	41	Calvin's Plumbing	0.12%
17	Island Solar Service, Inc. – Oahu	2.10%	42	Hawaiian Isle Electric, LLC	0.12%
18	Sun King – Maui	1.80%	43	HI-TECH Plumbing Corporation	0.12%
19	RT's Plumbing, Inc.	1.20%	44	M. Torigoe Plumbing, Inc.	0.12%
20	Solar Services Hawaii	1.08%	45	South Pacific Plumbing, LLC	0.12%
21	Kona Solar Service, LLC	1.02%	46	Best Plumbing & Electric, LLC	0.06%
22	Sun King – Oahu	0.84%	47	Faith Plumbing	0.06%
23	Qualified Plumbing	0.78%	48	Poncho's Solar Service – Big Island	0.06%
24	Royal Flush Plumbing	0.72%	49	Tamura Plumbing	0.06%
25	Allen's Plumbing – Maui	0.66%	**TOTAL**		**100.00%**

High-Efficiency Lighting

For PY14, the High-Efficiency Lighting Program achieved savings of 352,155,735 lifetime kWh energy, and 6,027 kW savings with $4,383,386 in incentives.

As mentioned previously, PY14 saw the LED market make even greater strides in qualifying products for the residential market. The 527,905 rebated units reflect an increase of 83% over PY13. Additionally, the Program moderated the volume of CFLs to a level of 1.3M (down from 1.5M) with an average incentive of $1.27 per unit.

Much effort was spent maintaining program participation with both manufacturers and retailers gained in PY13. The larger manufacturers included Cree, Westinghouse, Osram/Sylvania, GE, FEIT, Westinghouse, TCP and Phillips. The Program also recruited some smaller niche manufacturers such as Acuity, ETI, LSG, Green Light, and Batteries Plus, along with a few other distributors/retailers that work in the hardware, grocery and direct-to-consumer lighting markets. In PY14, the Program shifted focus away from big box stores, targeting CFL promotions with smaller retailer outlets in order to increase access to rebated products in more rural areas. Notably, we worked with Longs/CVS locally to distribute lighting in over 40 stores. This collaboration supported the local shopping model and provided high-efficiency lighting education. Feedback indicates that increased retailer education along with the proper selection of lighting products significantly drives customer adoption.

See **Table 62** for details.

*Includes 50 units (lamp) over-count from single distributor across two counties

Table 62
REEM High Efficiency Lighting Program Impacts

Category	Units	Program Demand (kW)	%	Program Energy (kWh 1st Yr)	%	Program Energy (kWh - Life)	%	Average Measure Life (Yrs)	TRB/ TRC	Total Resource Benefit	%	Total Resource Cost	%	Incentives	%
CFL	1,328,146*	4,645	77.1%	35,766,428	79.6%	214,598,569	60.9%	6.0	14.3	$ 28,454,247	64.3%	$ 1,992,219	27.9%	$ 1,694,358	38.7%
LED Lighting	527,905	1,382	22.9%	9,170,478	20.4%	137,557,166	39.1%	15.0	3.1	$ 15,820,407	35.7%	$ 5,147,074	72.1%	$ 2,689,028	61.3%
Total	**1,856,051**	**6,027**	**100%**	**44,936,906**	**100%**	**352,155,735**	**100%**	**7.8**	**6.2**	**$ 44,274,654**	**100%**	**$ 7,139,293**	**100%**	**$ 4,383,386**	**100%**

High-Efficiency Air Conditioning

For PY14, the High-Efficiency Air Conditioning Program achieved savings of 23,552,656 lifetime kWh energy and 697 kW savings with $449,710 in incentives. This represents a 163% increase in lifetime kWh savings from PY13.

Notably, Hawaii Energy launched its Window Air Conditioner (AC) Trade-Up program which offers residents a $50 rebate for the purchase of a qualified window AC when surrendering an old working unit for pick-up and recycling. 282 rebates were issued for units purchased through 10 participating retailers in PY14, achieving savings of 92,284 kWh (first year) and 47 kW with $14,100 in incentives. Although this fell short of the 1,000 unit target, we anticipate the program will be fully subscribed in PY15, as we are now well-positioned to maximize participation during the hot summer months.

The Program promoted the Window AC Trade-Up offer in a residential utility customer bill insert, distributed by Hawaiian Electric to over 300,000 customers in all three counties.

In PY14, Hawaii Energy also updated its residential Variable Refrigerant Flow Air Conditioner program requirements to simplify the application process and better align with the commercial program design. These updates were based on feedback from manufacturers and distributors regarding their experience with current and historical Hawaii Energy rebate offerings. This information gathering provided an opportunity for dialogue regarding the deemed savings for applications in residential air conditioning, thus allowing better analysis of program cost effectiveness.

Solar attic fans and whole house fans, introduced in PY10, continued to show steady demand.

See **Table 63** for details.

Table 63
REEM High Efficiency Air Conditioning Program Impacts

Category	Units	Program Demand (kW)	%	Program Energy (kWh 1st Yr)	%	Program Energy (kWh - Life)	%	Average Measure Life (Yrs)	TRB/ TRC	Total Resource Benefit	%	Total Resource Cost	%	Incentives	%
Variable Refrigerant Flow Air Conditioners	1,636	422	60.6%	844,897	46.0%	12,673,455	53.8%	15.0	4.4	$ 2,592,225	57.9%	$ 582,993	80.7%	$ 290,900	64.7%
Whole House Fan	399	175	25.1%	351,384	19.1%	7,027,685	29.8%	20.0	27.1	$ 1,295,220	28.9%	$ 47,880	6.6%	$ 29,925	6.7%
Ceiling Fans	2,901	48	6.9%	423,400	23.0%	2,117,000	9.0%	5.0	10.6	$ 276,355	6.2%	$ 26,109	3.6%	$ 101,535	22.6%
Window AC	282	47	6.7%	92,284	5.0%	1,107,409	4.7%	12.0	9.6	$ 244,794	5.5%	$ 25,380	3.5%	$ 14,100	3.1%
Solar Attic Fan	265	5	0.7%	125,421	6.8%	627,106	2.7%	5.0	1.7	$ 66,381	1.5%	$ 39,750	5.5%	$ 13,250	2.9%
Total	**5,483**	**697**	**100%**	**1,837,387**	**100%**	**23,552,656**	**100%**	**12.8**	**6.2**	**$ 4,474,975**	**100%**	**$ 722,112**	**100%**	**$ 449,710**	**100%**

High-Efficiency Appliances
For PY14, the High-Efficiency Appliances program achieved savings of 58,416,438 lifetime kWh energy and 479 kW savings with $855,238 in incentives.

Since PY09, Hawaii Energy has continued to expand its retail community to Hawaii and Maui counties, with a current total of over 200 retail participants. This includes many new independently owned retailers along with all of the "big box" retailers in the state. Hawaii Energy staff regularly visited all retailers throughout the program year to keep them updated on current rebate levels, promotions and to ensure proper display of Hawaii Energy's Point-of-Purchase (POP) collateral. Throughout the program year, retailers were regularly updated via emails and phone calls.

- The ENERGY STAR® Clothes Washer and VFD Controlled Pool Pump offers held steady in PY14 with 3,816 and 209 units, respectively.

- Refrigerator Trade-Up – In order to moderate demand and manage the available PBF funds, the Program continued to offer the Refrigerator Trade-Up program in four batches throughout PY14, while reducing the rebate amount from $125 to $100. Overall, program performance was slower than previous years in both scale and contribution to the REEM portfolio. Participation fell this year by 35% to 3,482 units, achieving 2,503,345 kWh savings from this offer and, reflecting 60% of the cost of the lifetime energy savings for the High-Efficiency Appliance Program. Despite the slower performance, the Trade-Up program continues to be a big contributor in getting newer energy efficient refrigerators on the grid and, most importantly, it ensures the older refrigerators are recycled and off the grid or decommissioned. The average age of refrigerators pulled off of the grid in PY14 was 11.67 years old, with the oldest refrigerators being 50 years old.

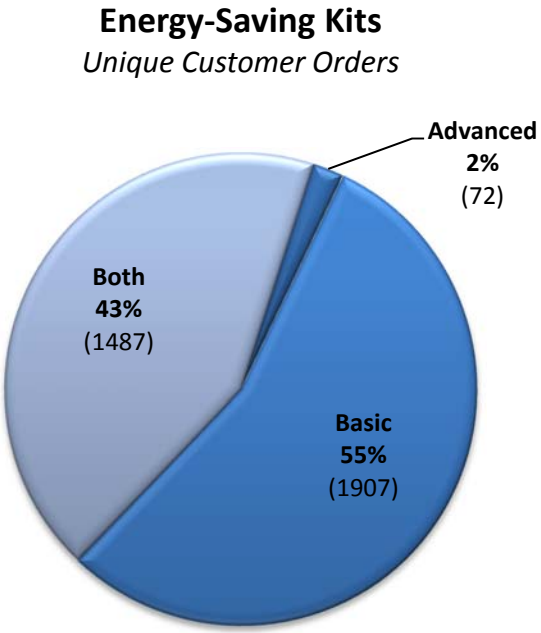
- Garage Refrigerator/Freezer Bounty Program – In PY14, the Refrigerator/Freezer Bounty Program continued as *Rid-A-Fridge to Fight Hunger*, a partnership between Hawaii Energy and local food banks. As an enhancement to the original Bounty program, which offers a rebate to customers who unplug and recycle a working refrigerator and/or freezer, *Rid-A-Fridge* allows customers to donate their rebate directly to their local food bank, by simply checking a box on their application. Participation in PY14 more than doubled that of PY13, with a total of 864 units surrendered for recycling. Additionally, at the conclusion of this year a total of $7,035 had been donated to Hawaii's food banks. This included $3,850 on Oahu, $1,170 on Maui and $2,015 on Hawaii Island.

- Energy Efficiency Equipment Kits – In PY14, Hawaii Energy introduced the Home Energy-Saving Kits – Online Fulfillment pilot program. As highlighted earlier, this pilot was Hawaii Energy's first-ever online store. Customers were able to order one basic energy saving kit and one advanced energy saving kit with direct delivery to their home, free of charge. The basic kit was free to customers and included one CFL lamp, one LED lamp, one low-flow showerhead and one faucet aerator. The advanced kit had a $10 customer co-pay and included two LED lamps and an advanced power strip.

  The success of this pilot far surpassed initial expectations by almost doubling the original target of 2,500 kits. The online store ran for six weeks, during which time a total of 4,953 kits were ordered. This included 3,394 basic kits and 1,559 advanced kits. It was particularly encouraging to see that of 3,466 unique customer orders approximately 43% (1,487 customers) ordered both kits. The program initiated some key online marketing initiatives that we believe helped drive customer traffic to the site. In particular, our online advertising campaign resulted in 339 conversions, approximately 10% of total unique orders.

Through this effort, Hawaii Energy also collected specific water heating and occupancy data in order to more accurately calculate energy savings potential. The program found that 48% of participant households indicated they had electric water heating and 37% indicated solar water heating. Participant households had an average of three occupants. Overall, the Home Energy-Saving Kits program achieved savings of 4,205,051 lifetime kWh energy and 242 kW savings with $128,348 in incentives. In PY15, Hawaii Energy will expand the provision of energy-saving devices in our online store. We also plan to incorporate additional web-based marketplace services for customers.

See **Table 64** for details.



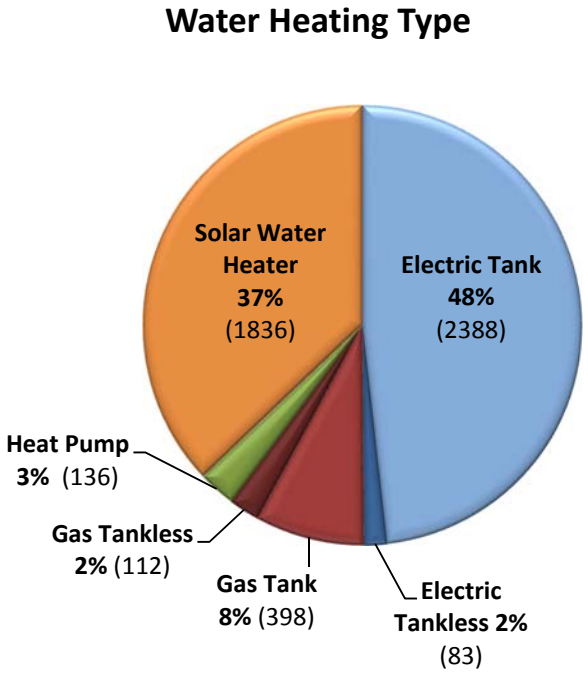


Table 64 REEM High-Efficiency Appliances Program Impacts															
Category	**Units**	**Program Demand (kW)**	**%**	**Program Energy (kWh 1st Yr.)**	**%**	**Program Energy (kWh - Life)**	**%**	**Average Measure Life (Years)**	**TRB/ TRC**	**Total Resource Benefit**	**%**	**Total Resource Cost**	**%**	**Incentives**	**%**
Refrigerator (With Recycling Of Old)	3,482	104	21.6%	2,503,345	54.1%	35,046,834	60.0%	14.0	0.7	$ 3,114,549	53.0%	$ 4,178,400	60.0%	$ 386,900	45.2%
Clothes Washer	3,816	93	19.5%	687,720	14.9%	8,252,645	14.1%	12.0	0.5	$ 980,685	16.7%	$ 2,098,800	30.2%	$ 190,800	22.3%
Refrigerator - Bounty	755	22	4.7%	565,682	12.2%	7,919,548	13.6%	14.0	16.5	$ 700,408	11.9%	$ 42,355	0.6%	$ 42,355	5.0%
Home Energy-Saving Kits-Online Fulfillment*	12	242	50.5%	574,934	12.4%	4,205,051	7.2%	7.3	6.1	$ 785,128	13.4%	$ 128,348	1.8%	$ 128,348	15.0%
Freezer - Bounty	109	3	0.7%	81,682	1.8%	1,143,551	2.0%	14.0	16.6	$ 101,136	1.7%	$ 6,095	0.1%	$ 6,095	0.7%
VFD Pool Pumps	209	1	0.2%	109,178	2.4%	1,091,783	1.9%	10.0	0.6	$ 96,204	1.6%	$ 156,750	2.3%	$ 31,350	3.7%
Advance Power Strips	2,413	9	2.0%	82,189	1.8%	410,946	0.7%	5.0	2.6	$ 53,892	0.9%	$ 20,502	0.3%	$ 20,565	2.4%
Refrigerator (Purchase New Only)	269	4	0.8%	24,720	0.5%	346,080	0.6%	14.0	0.2	$ 41,811	0.7%	$ 215,200	3.1%	$ 13,450	1.6%
Recycler App - Accounting	0	0	0.0%	0	0.0%	0	0.0%	0	0	$ 0	0.0%	$ 0	0.0%	$ 0	0.0%
Recycler App - Freezer	111	0	0.0%	0	0.0%	0	0.0%	0	0.0	$ 0	0.0%	$ 81,600	1.2%	$ 3,515	0.4%
Recycler App - Refrigerator	750	0	0.0%	0	0.0%	0	0.0%	0	0.0	$ 0	0.0%	$ 23,765	0.3%	$ 23,765	2.8%
Recycler App - Window AC	303	0	0.0%	0	0.0%	0	0.0%	0	0.0	$ 0	0.0%	$ 8,095	0.1%	$ 8,095	0.9%
Total	**12,229**	**479**	**100%**	**4,629,452**	**100%**	**58,416,438**	**100%**	**12.6**	**0.8**	**$ 5,873,813**	**100%**	**$ 6,959,910**	**100%**	**$ 855,238**	**100%**
*Unit number reflects the number of vendor transactions. The total number of kits ordered by customers was 4,953 as mentioned above.															

The Program used a mix of methods to promote the Home Energy-Saving Kits, including a postcard distributed at several outreach events (at right). The Program also leveraged the kit into an opportunity to 1) collect household water heating data and 2) promote additional rebates by including a copy of our Residential tri-fold brochure with every mailed kit.

Energy Awareness, Measurement and Control Systems

For PY14, the Energy Awareness, Measurement and Control Systems Program achieved savings of 7,162,958 lifetime kWh energy and 1,957 kW savings with $1,601,978 in incentives.

- Peer Group Comparison – In PY14, Hawaii Energy continued with the Peer Group Comparison Home Energy Report (HER) program. The Home Energy Report consists of an outbound mailer measuring a home's energy use against 100 homes in their peer group (i.e., similar sized home and demographics). Calls from customers responding to mailings range from general inquiries about the program to anger (e.g., save paper, privacy, low ranking). This is the expected outcome of the mailers, which are designed to elicit a strong response followed by behavioral changes. Customers are shown how to log in to their account and enter information specific to their home, followed by a discussion of how they could save money. Typically during the call, customers decide to continue their participation in the program. Hawaii Energy continues to maintain one of the lowest attrition rates nationwide for the Peer Group Comparison report. In all, 5,756,406 kWh savings came from this offer, reflecting 80% of the lifetime energy for the Energy Awareness and Control System program.

  In PY14, HERs were enhanced to include customized marketing modules designed using market segmentation analysis. For example, during one promotion, customers were segmented based on their energy usage characteristics and previous participation in the Hawaii Energy Solar Water Heating program. Depending on a customer's market segment, different messages were utilized to promote either the standard program offer, the Solar Water Heating tune-up program or encourage sign-ups for Hawaii Energy's e-newsletter. These tailored messages are designed to create a more personalized experience for customers by identifying programs that are better suited to their needs. We will continue more detailed data analysis in PY15 in order to enhance the effectiveness of these market segmentation efforts.

- Water Cooler Timers – In PY14, Hawaii Energy expanded its water cooler timer offer to include residential customers (in PY13 the offer was only available for businesses). The Program worked with a vendor to engage water delivery companies in order to distribute timers to their residential customers. The vendor also distributed directly to customers at community events. A total of 6,296 timers were delivered to residents, achieving a lifetime kWh savings of 1,406,552.

See **Table 65** for details.

Table 65
Energy Awareness Measurement and Control Systems Program Impacts

Category	Units	Program Demand (kW)	%	Program Energy (kWh 1st Yr.)	%	Program Energy (kWh - Life)	%	Average Measure Life (Years)	TRB/ TRC	Total Resource Benefit	%	Total Resource Cost	%	Incentives	%
Peer Group Comparison - Phase 1/2/3	1,476,265	1,957	100.0%	5,756,406	95.3%	5,756,406	80.4%	1.0	0.9	$ 1,351,980	90.8%	$ 1,507,538	94.1%	$ 1,507,538	94.1%
Water Cooler Timers	6,296	0	0.0%	281,310	4.7%	1,406,552	19.6%	5.0	1.5	$ 137,299	9.2%	$ 94,440	5.9%	$ 94,440	5.9%
Total	**1,482,561**	**1,957**	**100%**	**6,037,717**	**100%**	**7,162,958**	**100%**	**1.2**	**0.9**	**$ 1,489,279**	**100%**	**$ 1,601,978**	**100%**	**$ 1,601,978**	**100%**

Custom Energy Solutions for the Home (CESH)

Objectives

This incentive category provided a measure of flexibility within the prescriptive portfolio to accommodate unforeseen market opportunities with budgetary and unit cost targets that provide financial efficacy guidance to the Program and allies who champion these opportunities.

Impacts

Energy Efficiency Auction

The majority of the CESH operations expenditures took place during the first half of the year in the design and implementation of Hawaii Energy's first-ever Energy Efficiency Auction. This initiative invited contractors, energy vendors, property managers and developers to compete for funding of their independent, cost effective projects that focus on high energy consumption or hard-to-reach residential sectors. Projects eligible for the auction were any commercially available energy efficiency technology, mass installation opportunity, hard-to-reach market segment or offering either not currently served by existing Hawaii Energy programs or that contractors were able to accomplish in a more cost effective manner. Selected projects had to be completed by May 30th, 2015.

The Residential program received proposals for five different projects as a result of this Energy Efficiency Auction. From this pool, Hawaii Energy selected one proposal to fund: *Honeywell Smart Grid Solutions – Green Neighborhood Program.* The Green Neighborhood Program proposed the direct install of energy efficient technologies for approximately 1,800 homes in the "Phase 0" neighborhoods of Moanalua and Pearl City. Plans included the installation of high-efficiency showerheads, faucet aerators, advanced power strips and CFLs, with an added effort to address water heating insulation, air conditioning filters and refrigerator coil cleaning. All measures were designed to be free to the customer. In order to generate maximum participation, these efforts also included a comprehensive marketing strategy to enroll residents during an outreach and education campaign in their neighborhood.

Because of the tight timeline for completion before program year end, the Green Neighborhood Program faced constraints in execution as originally proposed. Thus, the CESH program closed out the year with minimal incentive expenditures and no claimed savings. In PY15 the Program will revisit the project to determine whether feasible to implement.

See **Table 66 and 67** for details.

Table 66 CESH Program Impacts															
Category	**Units**	**Program Demand (kW)**	**%**	**Program Energy (kWh 1st Yr.)**	**%**	**Program Energy (kWh - Life)**	**%**	**Average Measure Life (Years)**	**TRB/ TRC**	**Total Resource Benefit**	**%**	**Total Resource Cost**	**%**	**Incentives**	**%**
Efficiency Project Auction	1	0	0%	0	0%	0	0%	0	0.0	$ 0	0%	$ 1,319	100.0%	$ 1,319	100.0%
Total	**1**	**0**	**100%**	**0**	**100%**	**0**	**100%**	**0**	**0.0**	**$ 0**	**100%**	**$ 1,319**	**100%**	**$ 1,319**	**100%**

Expenditures

Table 67 CESH Program Expenditures					
	Total Expenditures	**PY14 Budget**	**Percent Spent**	**Unspent**	**Percent Unspent**
CESH Operations	$ 52,086.66	$ 53,000.00	98.28%	$ 913.34	1.72%
CESH Incentives	$ 1,319.08	$ 277,542.00	0.48%	$ 276,222.92	99.52%
Total CESH	**$ 53,405.74**	**$ 330,542.00**	**16.16%**	**$ 277,136.26**	**83.84%**

Residential Energy Services & Maintenance (RESM)

Objectives

The Residential Energy Services and Maintenance program targets ally-driven service offerings to enhance energy savings persistence and bootstrap fledgling energy services businesses trying to secure a toehold in Hawaii. For PY14, the RESM Program was comprised of the Solar Water Heating Tune-Up offering and Efficiency Inside Home Design Program. Overall the RESM Program achieved lifetime savings of 5,169,866 kWh and 50 kW with a total incentive of $301,350.

Accomplishments

Solar Water Heating Tune-Up Program

The Solar Water Heating Tune-Up program offered a $150 rebate to help offset the cost of maintenance for existing solar hot water systems. The Tune-Up program requires contractors to follow a key maintenance checklist to address system performance and longevity. The Program proved successful once again this year, exceeding the initial target of 1,000 tune-ups and finishing the year with a final count of 1,697 tune-ups performed. This work remains popular with contractors who see it as both an additional source of income and a means to build rapport with customers for future business.

In terms of system demographics, the program serviced a greater number of older systems during PY14. The average age of systems serviced in the Tune-Up program was 9.3 years old, which is 3.3 years older than the average system serviced in PY13. The oldest participant system was 38 years old. Additionally, there were 68 systems over 20 years old, and 20 systems over 30 years old. This represents a significant shift toward service of longer lifecycle systems as there were only six systems over 30 years old participating in PY13. We can interpret this data to mean that customers are eager to maintain systems beyond half-life and speaks to the longevity of all systems state-wide. We also saw a concentration of systems serviced in hotter sunshine zones during PY14 with 63% systems in the 400-450 zones and 24% in 500 zones.

Overall system condition once again ranked high, with approximately 70% of all systems rated as “Good” by the Contractors. However, several key performance indicators suggested that although the systems are visually sound, the effectiveness and necessity for the Tune-Up program is crucial to system longevity. For instance, 48% of system timers were not operational at the time of the Tune-Up. Since timer functionality is a key component for maximum system performance, we can infer that almost of half of the participant systems were not functioning at capacity before their tune-up. Furthermore, 38% of all anode rods replaced were in fair to poor condition. Again, we can infer that these systems were operating well below capacity as the deterioration of anode rods is the greatest threat to tank longevity and performance.

Overall, the PY14 Solar Tune-Up Program was highly successful for Hawaii Energy, Contractors, and Customers alike. We not only exceeded our original rebate targets, but also created an atmosphere for sustained business for Contractors and increased system longevity for Customers. We will continue to use data collected through the Tune-Up program to improve the SWH program design. In particular, in PY15 we will perform a more detailed analysis surrounding solar fraction and sizing requirements in the hotter sunshine zones. Hawaii Energy will also continue with the design and implementation of an educational campaign surrounding proper use of timers and promote the use of digital timers with contractors in order to increase program penetration.

Residential Design and Audit Programs – Efficiency Inside Home Design

Introduced in PY10, this program requires energy modeling to make comparisons between energy code-compliant designs and enhanced designs. Since this program's inception, Efficiency Inside has given Hawaii Energy the unprecedented opportunity to dive into the key characteristics of home energy use in Hawaii. Hawaii Energy has also established and maintained a productive relationship with a number of developers, modeling and testing consulting firms. PY14 served as the final year of our Efficiency Inside program, during which we incentivized 78 homes for energy modeling to close out the data collection.

In this final year, Hawaii Energy compared modeled energy consumption from past years with actual energy consumption data in a 400-home development, once the homes were occupied for 12 months. The analysis compared actual energy consumption to both the code-baseline and the as-designed Efficiency Inside models. On average, the homes as lived-in consumed 25% less energy than the code-baseline, and 15% less energy than the model predicted they would use as-designed. The Efficiency Inside incentives allowed the Program to identify the sources of these large savings over code. These include high Seasonal Energy Efficiency Ratio (SEER) air conditioning, improved roof insulation and attic cooling methods, tighter construction, an above-code window solar heat gain coefficient (SHGC), and a significantly decreased U-value of 0.31 due to the use of double-pane windows. The incremental improvements leading to decreased energy consumption are shown in **Figure 8** below.

The Program plans to use the data gathered over the last five years to work more closely with developers and residents, sharing data in a way that encourages behavioral changes in energy usage. In PY15, the Program will also work with the Hawaii State Energy Office by providing support for County building officials. As of this writing, the IECC 2015 energy code is being presented to the state and counties for adoption. Read more about Hawaii Energy's Codes Compliance study, creating energy code checklists, and the exploration of an incentive for early-implementation of energy codes in the Codes & Standards section (pg. 154).

Figure 8
Modeled vs. Actual Energy Consumption in Hawaii Residential New Construction

	IECC 2006	IECC 2006 - Hawaii	As-Constructed	Next Level of Performance	Actual home
kWh/Year	12,294	10,228 (2006-SWH)	8,968	8,675	7,656
Water Heating	Electric	Solar	Solar	Solar	Solar
A/C SEER	13	14	16	18	24.5
Ceiling Insulation	R-30	HI Amendment Options	(roof only)	(roof only)	(roof only)
Roof Insulation	HI Amendment Options	Attic R-19 / No Attic R-15 above roof or R-19 between frame	R-19.8	R-19.8	R-19.8
Construction Tightness SLA	0.00036	0.00036	0.00019	0.00019	0.00019
SHGC	0.4	0.3	0.22	0.22	0.22
Window U-value	1.2	1.2	0.31	0.31	0.31

Impacts

For details, see **Table 68**.

Table 68 RESM Program Impacts															
Category	**Units**	**Program Demand (kW)**	**%**	**Program Energy (kWh 1st Yr.)**	**%**	**Program Energy (kWh - Life)**	**%**	**Average Measure Life (Years)**	**TRB/ TRC**	**Total Resource Benefit**	**%**	**Total Resource Cost**	**%**	**Incentives**	**%**
Efficiency Inside Home Design	78	0	0.0%	201,039	31.8%	3,015,579	58.3%	15.0	4.9	$ 230,167	44.9%	$ 46,800	8.4%	$ 46,800	15.5%
Solar Water Heating Tune-Up	1,697	50	100.0%	430,857	68.2%	2,154,287	41.7%	5.0	0.6	$ 282,376	55.1%	$ 509,100	91.6%	$ 254,550	84.5%
Total	**1,775**	**50**	**100%**	**631,896**	**100%**	**5,169,866**	**100%**	**8.2**	**0.9**	**$ 512,543**	**100%**	**$ 555,900**	**100%**	**$ 301,350**	**100%**

Expenditures

In PY14, the RESM program spent $301,350, or 73.5% of the incentive budget.*

See **Table 69** for details.

Table 69 RESM Program Expenditures					
	Total Expenditures	**PY14 Budget**	**Percent Spent**	**Unspent**	**Percent Unspent**
RESM	$ 48,953.55	$ 49,000.00	99.91%	$ 46.45	0.09%
RESM	$ 301,350.00	$ 410,000.00	73.50%	$ 108,650.00	26.50%
Total RESM	**$ 350,303.55**	**$ 459,000.00**	**76.32%**	**$ 108,696.45**	**23.68%**

**Percent spent based on final budget allocations.*

Residential Hard-To-Reach (RHTR)

Objectives

The Residential Hard-To-Reach program seeks to secure various projects among geographies and demographics that have been traditionally underserved. This incentive category specifically addresses landlord/tenant barriers through direct installation of energy saving technologies.

Accomplishments

Multifamily Direct Installation – Energy $mart 4 Homes (E$4H)

PY14 marked the expansion into another facet of direct install opportunities through the introduction of the Energy $mart 4 Homes (E$4H) program for multifamily residential properties. E$4H targets an underserved portion of the multifamily market including master-metered and rental units, which account for approximately 20% of total residential energy use in Hawaii (Figure ES-3, *2014 Energy Efficiency Potential Study*). This scope of work includes marketing analysis and segmentation of multifamily properties with direct outreach of the program to property management companies, housing associations, housing communities, and building owners. The initial geographic focus is only on Oahu with the expansion to the neighbor islands as an option in a future phase.

Properties that sign on to E$4H receive replacement technologies for all units, which include the following four energy efficient measures:
1) Compact fluorescent lamps (CFLs), 2) high-efficiency showerheads, 3) high-efficiency faucet aerators and 4) advanced power strips. All measures are provided at no-cost to the property owner or residents. Installation technicians are assigned to remove and replace existing incandescent light bulbs, and higher-flow bath and kitchen fixture attachments for each residential unit as needed. Technicians also offer basic energy efficiency tips and information to tenants during the time of installation.

Since the launching of the program in Q3, 33 multifamily properties with a total of 1,524 residential units were retrofitted in four months. Of these, 1,150 units fell under a residential rate code and 374 units were part of commercial master-metered buildings. The E$4H program was particularly successful engaging senior living residential properties, subsidized housing and single-party owned properties.

E$4H has provided a valuable service to properties and individuals that otherwise might not have had the means, opportunity, or motivation to improve and upgrade those units to a greater level of overall energy efficiency. One of the greatest lessons learned during PY14 was the importance of proper market segmentation for this type of program as we streamlined the targeting and better aligned the program with the needs of key stakeholders. We have also gained a great deal of insight into consumer behavior and perception surrounding energy efficiency. From these experiences we have found that continued education and engagement with residents in the home is vital to gaining trust and support from both multifamily building owners and the individual occupants.

In PY15 we will expand the reach of the program with a target of 4,000 units and will also diversify measures to include decorative globe and small base LED lighting in order to address ceiling fan and sconce applications that we were not able to retrofit in the initial program stage.

Solar Water Heater – Direct Install

In PY14 the Program worked with Hawaii County Economic Opportunity Council (HCEOC) to install 70 solar water heating systems for "in need" families. It was determined that by collaborating on this project, with the Program providing funding for solar water heating systems, HCEOC could extend its grant to help more families in other ways.

CFL Exchange

Carried over from PY13, Hawaii Energy finalized its CFL exchange in PY14. This final exchange effort targeted multifamily properties and community organizations serving a diverse population of residents. Groups were incentivized to exchange old incandescent bulbs for ENERGY STAR® CFLs provided by Hawaii Energy. For each bulb exchanged the participating organization received a $.50 bonus. Additionally, the Program offered free pick up and disposal of the incandescent bulbs collected. In all, 10 properties and 3 community organizations participated, exchanging over 5,000 bulbs.

Impacts

During PY14 Hawaii Energy built on PY13 successes and continued to provide Residential Hard-to-reach (RHTR) resources to traditionally underserved demographics. For PY14, the Residential Hard-To-Reach program achieved lifetime savings of 4,415,256 kWh (first year) and 159 kW savings with $664,297 in incentives.

See **Table 70** for details.

Table 70
RHTR Program Impacts

Category	Units	Program Demand (kW)	%	Program Energy (kWh 1st Yr)	%	Program Energy (kWh - Life)	%	Average Measure Life (Years)	TRB/ TRC	Total Resource Benefit	%	Total Resource Cost	%	Incentives	%
Solar Water Heating	70	27	17.3%	123,387	20.3%	1,850,802	41.9%	15.0	0.4	$ 247,031	35.3%	$ 579,675	87.6%	$ 579,675	87.3%
CFL Exchange	12,636	21	13.0%	149,583	24.7%	897,500	20.3%	6.0	8.3	$ 121,140	17.3%	$ 14,549	2.2%	$ 14,549	2.2%
CFL	4,902	22	13.6%	151,124	24.9%	755,622	17.1%	5.0	5.3	$ 105,209	15.0%	$ 19,682	3.0%	$ 19,682	3.0%
Showerhead	868	62	38.9%	77,200	12.7%	386,001	8.7%	5.0	8.4	$ 133,047	19.0%	$ 15,827	2.4%	$ 15,827	2.4%
Advance Power Strips	875	8	5.0%	70,100	11.6%	350,501	7.9%	5.0	2.3	$ 45,520	6.5%	$ 20,011	3.0%	$ 20,011	3.0%
Aerator	1,835	19	12.2%	34,966	5.8%	174,831	4.0%	5.0	3.9	$ 47,753	6.8%	$ 12,122	1.8%	$ 12,122	1.8%
Accounting	14	0	0.0%	0	0.0%	0	0.0%	0	0	$ 0	0.0%	$ 0	0.0%	$ 2,431	0.4%
Total	**21,200**	**159**	**100%**	**606,361**	**100%**	**4,415,256**	**100%**	**7.3**	**1.1**	**$ 699,700**	**100%**	**$ 661,866**	**100%**	**$ 664,297**	**100%**

Expenditures

See **Table 71** for detailed expenditures and unspent funds.

Table 71
RHTR Program Expenditures

	Total Expenditures	PY14 Budget	Percent Spent	Unspent	Percent Unspent
RHTR Operations	$ 407,446.45	$ 408,000.00	99.86%	$ 553.55	0.14%
RHTR Incentives	$ 664,296.93	$ 1,061,250.00	62.60%	$ 396,953.07	37.40%
Total RHTR	**$ 1,071,743.38**	**$ 1,469,250.00**	**72.94%**	**$ 397,506.62**	**27.06%**

TRANSFORMATIONAL PROGRAM

Introduction

Market transformation seeks to identify, assess, and help overcome market barriers that inhibit residents and businesses from adopting energy efficient technologies and practices. Hawaii Energy facilitates:

- People being aware and informed about their energy use to allow them to consciously use energy at home and work,
- Professionals being effective at educating others and selling efficiency,
- Technical experts gaining the knowledge and skills required to buy and operate efficient equipment, and
- Decision makers incorporating comprehensive energy management strategies into their organizations.

This is accomplished through education, training, targeted behavior change campaigns, pilot projects, and research efforts to better understand the markets we serve. We foster relationships across the energy sector and engage multiple partners and stakeholders to build successful energy management systems. As it matures, the Market Transformation program is developing metrics and tracking systems to help link outcomes more directly to energy savings. Through the expertise and collaboration of Hawaii Energy staff and subcontractors throughout PY14, the Transformational program met and exceeded nearly all of its goals and addressed some additional priorities that were recognized throughout the Program Year. See **Table 72** for details on Transformational achievements.

Table 72 Transformational Achievements			
	Participants		
Category	**Achieved**	**Minimum**	**Target**
*Behavior Modification**	71,176*	12,600	18,000
Helen Wai – Sharing the Aloha	4,201		
BPF – WEfficiency	4		
Kanu Training Curriculum	905		
Kanu – Social Media & Devices	64,866		
Professional Development	1,828	700	1,000
The NEED Project	332		
Kupu Hawaii – RISE Program	6		
IFMA – Conference & Expo	1		
EEFG – Training	1,199		
University of Hawaii	268		
HPU – Green Office Program	22		
Technical Training	584	175	250
ASWB Workshop	384		
CEM - AEE	39		
BOC - UHMOC & SLIM	67		
W/WW Systems Trainings	49		
Fisher-Nickel	45		
Clean Energy Ally Program	226	n/a	200
Pilot Projects	**Actions**		
Benchmarking	428	200	500
Codes and Standards	Market Survey & 1 Action	Market Survey & 1 Action	Market Survey & 2 Actions
Demand Response	Market Survey & 3 Actions	Market Survey & 1 Action	Market Survey & 2 Actions
Smart Grid	Market Survey & 2 Actions	Market Survey & 1 Action	Market Survey & 2 Actions
Electric Vehicle	Market Survey & 3 Actions	Market Survey & 1 Action	Market Survey & 2 Actions

**Behavior modification participation numbers can be divided into two broad types of engagement: social/electronic media and education/training/other. 64,866 "participants" represent engagement through social media and email communication including "liking, sharing, or commenting" on social media posts, viewing energy efficiency education videos, and opening educational emails. The remaining 6,310 "participants" represent participation in trainings, events, projects, or energy saving competitions.*

Hawaii Energy's Market Transformational program seeks to ensure that activities will have a direct impact on energy savings within a five year time horizon and has a special focus on "hard-to-reach" ratepayers who are traditionally underserved by energy efficiency and conservation programs. In PY14 the Program continued to build on successful projects from previous years by deepening and broadening engagement and adapting programs based on lessons learned and recommendations from the PY12 EM&V report. For example, Hawaii Energy began developing logic models to articulate project outcomes, rationale, and support the development of metrics to track progress over time. Additionally, the Transformational program explored new pilot projects including community-based social marketing and technical training to support energy efficiency in the food service industry. We also began to explore how to provide Strategic Energy Management (SEM) services to large institutional energy users, primarily through work with the University of Hawaii.

New this year, Hawaii Energy launched five pilot projects related to various aspects of demand side management. The topics were: smart grid, codes and standards, benchmarking, electric vehicles, and demand response. The primary objectives were to demonstrate proof-of-concept on a small scale and to identify issues that must be resolved before expansion. Details and lessons learned are described in the "Energy Systems Integration Pilots" section below.

Behavior Modification

Behavior modification programs help people make daily decisions that reduce energy use. In PY14, we continued our focus on building energy literacy with "hard-to-reach" residential and business customers and those in underserved communities. We achieved noticeable increases in social media reach through an ongoing collaboration with Kanu Hawaii. We also expanded our program to include an energy-saving competition for residents and a community-based social marketing pilot focused on the AOAO market.

Energy Literacy in Hard-to-Reach Communities

For a fourth program year, Hawaii Energy offered free "Sharing the Aloha" energy efficiency workshops to residential ratepayers across Honolulu, Hawaii and Maui counties. These workshops target "hard-to-reach", who are typically residents with more than one job, extended families residing in geographically-isolated areas, or others who, for a variety of reasons, have been challenging for the Program to engage with and may have had little exposure to energy education. Workshops blend financial and energy literacy to connect energy-saving behaviors to reducing the cost of a household's electric bill. Attendees are also given a workbook and a simple energy-saving item to use in their home during the one-hour training. In PY14, 4,201 participants from all three counties attended a total of 164 workshops. Since beginning the workshops, the Program has seen a total of more than 12,000 participants in 438 workshops with wide island equity distribution (56% in the Honolulu County, 23% in Hawaii County and 21% in Maui County).

Community educator Helen Wai uses her "local-style" delivery and personal experiences to shed light on the often challenging concepts of energy efficiency and conservation. Helen has presented on behalf of the Program to all kinds of audiences, from corporate functions with 100+ attendees to small family groups in rural communities.

Trainings are led by longtime community educator Helen Wai and hosted by community organizations, housing and condo associations, government agencies, and local employers. Helen, who was born and raised in Nanakuli, has been training Hawaii residents in financial literacy, homebuyer education, foreclosure prevention, lease cancellation and energy efficiency in Hawaii for over 16 years.

Over the past four years, Hawaii Energy has received a number of positive testimonials about Helen's down-to-earth nature, engaging storytelling style and her ability to help people easily understand their energy use. This year at the 7th Annual Hawaii Clean Energy Day, Governor David Ige and the Hawaii Energy Policy Forum presented the "Transformational Achievements in Clean Energy" award to Helen and Hawaii Energy for the "Sharing the Aloha" workshops.

Each year, Helen expands the program's reach into new geographical areas and builds new connections with community partners. Notably, Helen was able to work with the Public Housing Authority to engage over 1,200 primarily low-income participants in the workshops this year. This represents a significant breakthrough with this target audience. Additionally, Helen continued to collaborate with non-profit service and employee union organizations bringing in over 2,600 participants in PY14, twice the number achieved with these groups last year.

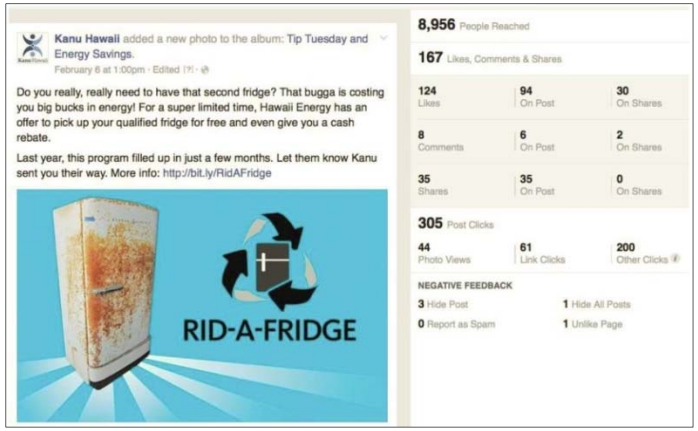
Hawaii Energy continues to work with Helen to refine the "Sharing the Aloha" curriculum based on participant feedback. A logic model was developed this year to better articulate the project's goals and move towards establishing measurable indicators of progress to help improve project design over time. The Program anticipates continued improvement to the content and an emphasis on reaching larger audiences in PY15.

Kanu Hawaii

Kanu Hawaii (Kanu) is a locally-based 501(c)(3) nonprofit that empowers people to build more environmentally-sustainable, compassionate, and self-reliant communities through demonstrations of *kuleana,* or responsibility. Members of Kanu commit to "being the change" they seek - taking specific actions that preserve and protect Hawaii's unique way of life. Over its five-year history, Kanu has attracted nearly 20,000 members spread across every zip code in the Hawaiian Islands, using grassroots community organizing, unique Kanu-developed online tools and bold social media outreach, reaching well over 100,000 people annually online. Kanu's communication style is different from other energy groups and organizations – they intentionally use a "local-style" of language and intersperse energy-focused messages with other creative and interesting messages to keep their community engaged. It has proven extremely effective in connecting with Hawaii's residents to build awareness about energy efficiency.

Catalyzing Energy Efficiency Dialogue through Social Media

Social media is a powerful, cost-effective tool for reaching the community with energy-saving information and offerings. Over the past three years, Hawaii Energy has collaborated with Kanu to raise energy efficiency awareness levels in the public arena via social media, using specialized content designed to engage customers, yet provide technically-accurate information. This year's work with Kanu focused on improving the design and distribution methods for their previously-developed energy tip memes (an image, video, phrase, etc. spread through the internet) and general energy-saving messages, as well as the promotion of specific Hawaii Energy residential rebate programs.



Kanu Hawaii used posts like the above on their Facebook page to encourage their followers to take advantage of Hawaii Energy rebates.

Kanu established four channels of content distribution this program year:

- *Energy Efficiency Icebreakers*: memes published through Facebook posts
- Targeted promotion of Hawaii Energy offerings published through Facebook posts
- "*Tip Tuesday*," a weekly opt-in email message service that people could choose to enroll in to receive energy saving tips.
- Promotion of the Advanced Power Strip (APS) Distribution Project via social media (see the "Pay-It-Forward" section below for more information on the deployment of APS devices).

Each of these channels offered a different level of commitment and action from participants, which included basic viewing and sharing of content, signing up for Hawaii Energy newsletters, subscribing to weekly "Tip-Tuesday" emails and taking advantage of Hawaii Energy rebates (i.e. Rid-A-Fridge or Solar Water Heating).

Reach to Hawaii's residents was expanded through social media "sharing, commenting and liking", and this year, the Hawaii Energy messages received a total of 64,866 engagements over a six-month time period as indicated below.

Key Findings
Kanu reported the following summarized results:

Social Media Strategy	Reach/ View*	Engagement**	Sticky %***
Energy Efficiency Icebreakers	661,557	46,045	6.96%
Promotion of Hawaii Energy Offerings	103,559	5,232	5.05%
Advanced Power Strip Promotion	168,058	12,371	7.36%
Tip Tuesdays	3,672	1,218	33.17%
Totals	936,846	64,866	6.92%

*Reach/View refers to the number of times a post is viewed
**Engagement refers to a verifiable interaction including viewing a video; signing up for a service; liking, sharing, or commenting on a post; or clicking through to another a website
***Sticky % refers to the percentage of people that convert from a viewer to someone who engages with the information presented as defined above

We have seen that Kanu Hawaii is particularly effective at reaching customers through social and electronic media, extending the reach of Hawaii Energy into households that might not otherwise engage with energy efficiency. Using local images and language continues to be an effective way to reach people across the state at scale. Kanu received multiple comments on how the content resonated with people. For instance, a woman commented and shared an energy post saying, "Any tip that includes the Hawaiian word "Pilau" is worth sharing!" Overall, there are many lessons learned that can be applied as we continue to refine this work. See below for a summary by initiative.

Energy Efficiency Icebreakers:

- The most viral (largest reach) post was a tip about cooking more efficiently in the rice cooker than in the oven and included advice to, "Make Ono Banana Bread in your Rice Cooker." One government staff commented in a meeting, "Oh! That was you guys… I ran off to Umeke Market to buy some bananas." These types of special interest pieces encourage action and sharing.
- Positive comments about "Will the Cat," the character used in the energy saving memes, came from people across the state. People may not know that the cat is connected to Kanu or Hawaii Energy, but they do know the cat is connected to saving energy. Characters like the cat can help people engage with energy efficiency; though, as in the anecdotal evidence, it may not be well suited for connecting to a brand name.

Targeted Promotion of Hawaii Energy Offerings:

- Some of the promotions such as Rid-A-Fridge and the Solar Water Heater Tune-Up had high engagement rates despite the fact that the specific offers did not apply to all viewers.
- Future projects would benefit from having systems in place to track actions taken by people who click through. The online advertising industry has been moving towards this type of "pay per action."

- The Dare to Compare post (see image at right) was our "stickiest" post meaning that 16% of people who saw it, engaged with it, compared with 7% average stickiness overall.

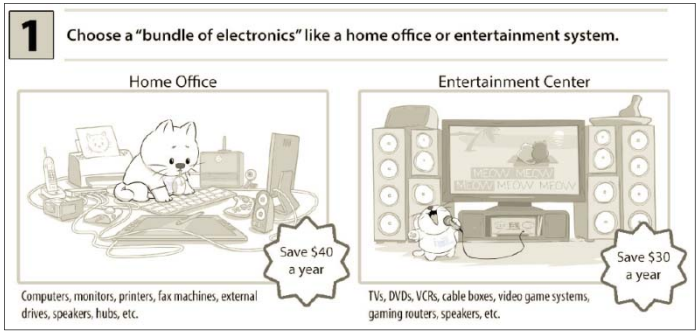
Tip Tuesday:

- 542 participants chose to enroll in the 26-week curriculum of emails to be received weekly on Tuesdays in their inbox (exceeding the goal of 500).
- 12% of enrollees chose to complete the pre-program "welcome" survey. Of those:
    - More than half of respondents knew 5 or fewer ways to reduce electricity use in the home.
    - Approximately 56% reported prior awareness of Hawaii Energy, which is consistent with market research completed this Program Year.
    - 46% of them were renters.
- Of the 46 people who took the follow-up survey more than 56% (22 respondents) scored it 1 or 2 (on a scale of 1 to 5, with 1 being best) in helpfulness for learning how to save energy.
- In future pilots it would be helpful to design the survey methodology to evaluate how effective the program is in raising awareness about Hawaii Energy and energy efficiency and conservation.

During the next Program Year, Hawaii Energy will work with Kanu to refine the messages and continue to engage ratepayers with energy efficiency through social media. We will look for new, creative ways to use the memes to reach our customers and develop survey methods to measure effectiveness and customer energy savings.

Pay-It-Forward – Creating Value for Simple Energy-Saving Devices

Many residential ratepayers lack the understanding of the value of such equipment and the standard instructions that accompany these devices are often difficult to understand, leading to incorrect or no use at all. Last year the Market Transformation program worked with Kanu Hawaii to pilot a distribution and education process for simple energy-saving devices. Their "pay-it-forward" model encourages participants to share a second device with families and friends, thus expanding the reach of the program. This year, Kanu Hawaii expanded efforts and distributed 1,200 advanced power strips through the pay-it-forward model. With the findings, Hawaii Energy plans to develop subsequent offers that would be well-designed to succeed, especially among hard-to-reach sectors.



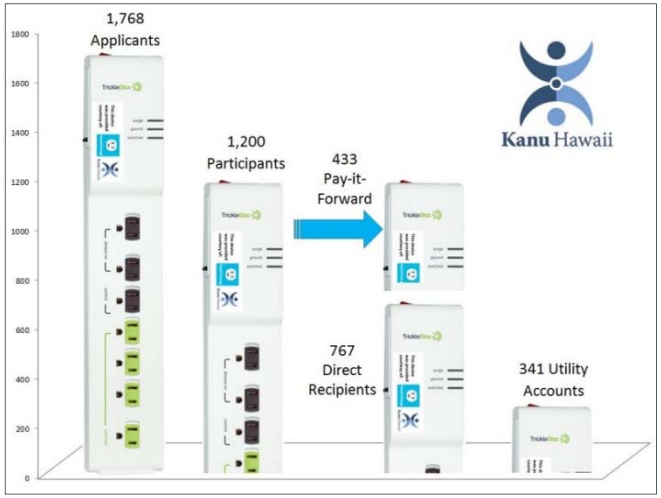
Kanu refined the "Pay-it-Forward" distribution method this program year and chose advanced power strips as the designated item.
Over 1,200 Kanu members utilized an online portal (left) as well as paper instructions included with the mailed power strips (right) to setup, use and share their devices.

Kanu developed an online portal for people to sign up in order to manage this multi-step project that required repeated participant engagement. Participants agreed to: fill out the application for themselves and a friend (they could also choose to send to multiple friends), set up the device for themselves and teach their friend(s) how to use it, upload pictures of the setup devices and fill out a survey at the end. The project involved both a social media outreach stage (results described above) and the device distribution phase to the 1,200 qualified, enrolled applicants.

Key Findings

The results of the distribution phase were reported by Kanu as follows:

- A total of 1,200 participants were recruited from 1,768 who signed up or were added as friends by others who had signed up.
- 767 received the APS directly from Kanu and 433 received through the pay-it-forward mechanism from a friend or family member.
- 70% of participants were home owners. 30% of participants were renters.
- 859 (71%) did not offer account information, 341 (29%) of the participants were able to verify their utility account number.
- 14% of participants completed a follow-up survey. Of those, over 87% felt that the power strip was easy or very easy to set up following Kanu's version of the setup instructions with only four people asking for additional help. 43 people said they made some other energy change along with setting up the power strip. The percentage of people who knew fewer than three ways to save energy decreased from approximately 28% to less than 16%.



A total of 1,200 residents received an advanced power strip through the Pay-It-Forward offer. 767 received their strip directly from Kanu and an additional 433 residents reported receiving their device through the Pay-It-Forward mechanism. Hawaii Energy was able to collect utility account information from 341 participants.

The distribution process has been refined through two years of piloting and has proven successful at delivering energy saving devices with instructions that make them easy to use but the customer intake process continues to present significant challenges. Specifically,

collection of utility account data is a barrier, particularly for renters. There is some indication that receiving the device may lead to reductions in energy use, but more analysis is needed to determine whether this is a cost-effective method for achieving the goals of raising awareness and lasting energy savings. Some participants reported implementing additional changes to save energy, along with installing the APS device, indicating there may be additional energy saving benefits to the program that could be further explored in future pilots.

60 Day Energy Challenge

Kanu Hawaii piloted the use of employer- and community-based energy contests as a way to reduce household energy consumption. The long-term goal is to develop a "turn-key" solution for self-managed energy-saving competitions. For this pilot, Kanu recruited five employers and community organizations to co-sponsor an "Energy Challenge" – a 60-day competition among employees of the company or members of community organizations (e.g., church, school, and neighborhood association). In addition to the group contest, a "Self-Service" energy course was also available for any individuals wishing to participate.

During the two month period, participants competed to see who could achieve the largest percent reduction in household electricity use, compared to the two months prior to the Challenge. All participants received weekly emailed tips and encouragement. Participants had access to an online course delivered through 19 entertaining, five-minute video clips of energy-saving tips. The program created an environment of friendly competition between colleagues, providing the incentive, inspiration and information needed to cut electric bills and help reduce Hawaii's dependence on imported oil. Participants' energy use was tracked and reported when utility bill information was available. Kanu worked with Hawaii Energy to recognize and award winners.

Key Findings

Overall, there were no significant savings by the participants generated by this initiative. There were dramatic results seen in the winners' energy reductions, though many took on short-term sacrifices in order to receive the prizes. One particular action, however, that provided good results for participants was turning off of the stand-by element in water heaters – a method that has the potential to provide persistent savings and is easily repeatable by others.

Specifically, Kanu reported that for the group contests:

- 5 companies enrolled with a total of 365 participants, exceeding the minimum target of 250 participants.
- 38% provided their electric account information.
- 59% of the participants were renters, a higher percentage than is found in the general population (44% in Honolulu County).
- Emails had a 36% open rate with 12% of them clicking-through to view the video course. (Note that there may have been additional views not captured by the system.)

Hawaii Prince Hotel was the largest employer group with 202 participants in the 60-Day Energy Challenge. Winners were surprised at work by Kanu and Hawaii Energy team members and presented with a prize bag for their efforts.

For the Self-Service course:

- 540 participants enrolled, exceeding the minimum target of 500 participants.
- 8% enrolled with their electric account information.
- 36% of participants were renters.
- Emails had a 40% open rate with 8% of them clicking-through to view the video course.

Kanu identified the following barriers to participation:

- Requiring and verifying electric utility account numbers.
- Company policy restricting the viewing of web content.
- Falling engagement rates throughout the course of the email drip message campaign.
- Limited ability to analyze behavior changes for homes with photovoltaic (PV) systems installed.
- Participants rating "prizes and recognition" as the most effective element in getting them to save energy.

Many lessons were also learned about how to implement an employer-based home energy saving competition. Based on PY14 findings, offering a turn-key group energy challenge that can be implemented without Hawaii Energy involvement may not be feasible. It will likely require a minimum "light touch" of support. If employers take on the task of internal promotion, recruitment, and registration and Hawaii Energy provides support for data management, analysis, and troubleshooting, this might be viable and cost-effective as an outreach and awareness building tool. Nearly all employers saw benefits in the areas of employee morale, team-building and potential PR/communications value, and there are anecdotal indications that there may be ripple effects of participants sharing information within the businesses in which they work and with their peers and neighbors. For example, one company launched a series of lighting retrofits during the contest and the engineering team that advocated for the changes reported it would have been difficult to get the projects funded without the enthusiasm generated by the contest. This model was also successful in reaching participants with limited prior knowledge of energy efficiency in the hard-to-reach sector.

Using lessons learned from this pilot, Hawaii Energy will work with Kanu to continue to refine the self-service energy video curriculum distributed through an email drip message system. Also, it is clear that developing a more user-friendly mechanism to verify utility account information would have great value as it would allow for a better evaluation of energy savings.

Community Based Social Marketing (CBSM) Campaign for Energy Efficiency in the Association of Apartment Owners (AOAO) Market

The Program launched a new community-based social marketing (CBSM) pilot project to conduct effective campaigns to encourage energy-saving behavior changes. CBSM is a best practice methodology to achieve lasting, quantifiable changes through targeting specific actions that have a meaningful impact on energy use. It offers a proven research and metrics-based alternative to traditional education campaigns by bringing together principles of psychology with applied research methods into a practical and implementable framework to promote energy efficient choices. The goal is to develop scalable marketing campaigns that can be implemented broadly across Hawaii in future years, as well as to develop the local capacity to implement CBSM to promote energy efficiency and conservation.

To launch this effort, Hawaii Energy engaged experts from Action Research, a mainland-based consultancy that specializes in CBSM and includes some of the nation's foremost CBSM experts. Action Research partnered with Susty Pacific, a Hawaii-based company, to build local capacity and expertise to support future CBSM energy efficiency projects. Hawaii Energy hosted a training session on the fundamentals of CBSM for Susty Pacific, Kanu Hawaii, the University of Hawaii, Hawaii Pacific University, Kupu Hawaii and Hawaii Energy staff.

Since CBSM is designed to be highly-customized to meet the needs of specific communities, Action Research worked with Hawaii Energy staff to select a target audience for the pilot. Hawaii Energy selected the Association of Apartment Owners (AOAO) market sector partly due to the significant challenges previously faced in implementing energy efficiency in this market segment, with the target outcome of instituting energy-saving behaviors in multifamily properties.

The next step in PY15 is to hone in on the most impactful behaviors. Technical experts were surveyed through an online research tool and 20 property managers from selected AOAO buildings and complexes were interviewed by phone. Based on findings from the online survey and phone interviews, a mail survey was prepared in PY14 to be distributed to 1,000 residents in 30 properties during the next program year. Hawaii Energy plans to continue this collaboration with Action Research and Susty Pacific to complete the implementation of these energy-changing behavior campaigns.

Collaborative Projects and Sponsorships

Blue Planet Foundation & WEfficiency

Hawaii Energy supported Blue Planet Foundation's new program, WEfficiency, which is an online lending platform where community members can make a loan to support a non-profit's energy efficiency project. Hawaii Energy's intent was to understand the efficacy of this strategy to fund projects in the hard-to-reach, nonprofit sector.

Through the WEfficiency platform, the nonprofit collects pledges to pay for the project. Once the target amount is met, the project is funded. Thereafter, a portion of the nonprofit's monthly energy savings (80-90%) will be used to repay the lenders. The lenders can opt to "recycle" the funds into further energy projects, donate the funds, or withdraw the funds. Once the lending crowd is repaid, the nonprofit may keep the money generated through future energy savings to further their mission and work.

The campaigns were successful in fully funding three pilot projects and the overall concept was well received. However, broadening the scale and capacity of the platform will most likely require additional investment for development.

"Building a Community of Change Agents: Learning About and Responding to Climate Change" at Kapiolani Community College

Kapiolani Community College (KCC) has a track record of training their students to be advocates for positive change. At their request, the Transformational team at Hawaii Energy collaborated with KCC's Service & Sustainability Learning Program to engage students in the leadership initiative, "Building a Community of Change Agents: Learning About and Responding to Climate Change." The Program's purpose was to ensure that as students learn about climate change, they understand the importance of energy efficiency and conservation and can become informed leaders in their community. Approximately 20 student leaders were trained to deliver messages about behavior change to mitigate the impact of climate change and sea level rise in Hawaii, emphasizing the importance of energy efficiency to reduce Hawaii's reliance on petroleum. Focusing on the strong influence of peer-to-peer teachings, students were encouraged to reach out to their peers and start the conversation on energy efficiency informing them about actionable measures their communities can take to improve Hawaii's dependence on fossil fuels. Student evaluations reported that they gained knowledge and awareness on energy efficiency and reported sharing that information with their friends and families.

Aloha+ Challenge and Energy Dashboard

Hawaii Energy was a sponsor of the Aloha+ Challenge and the Sustainability Measures Dashboard project. The Aloha+ Challenge is a statewide commitment to six sustainability targets for 2030 signed by the Governor, four Mayors and leadership from the Office of Hawaiian Affairs and unanimously endorsed by the State Legislature last year. The dashboard was designed to be an easy-to-understand, on-line resource that features indicators to track progress on clean energy and solid waste reduction at state and county levels. It also provides links to "Learn More and Make a Difference", where energy conservation and Hawaii Energy are featured. Prior to launching the energy dashboard, Hawaii Energy provided consultation on the development of the energy section of the dashboard and participated in briefings on each of the islands in our service territory over the course of the year. Hawaii Energy plans to continue to engage with Hawaii Green Growth and the dashboard in the future.

Professional Development

Professional development offerings target those who are in positions of influence to affect energy decisions at home and in businesses. These include teachers, energy sales professionals, and those entering or currently in the energy workforce. The Market Transformation Program continued several successful projects educating K-12 students and energy salespeople and expanded internship offerings to include a new collaboration with Hawaii Pacific University. Also this year, the University of Hawaii West Oahu Facilities Management decree program was further supported and is set to officially launch in PY15.

Energy Education in the Schools

For the 4th consecutive year, Hawaii Energy continued its efforts in bringing energy education into the classroom and reaching households through educating students.

The National Energy Education Development (NEED) Project brings over 30 years of experience in energy education and tailors their lessons and materials to Hawaii education standards and climactic and energy conditions. NEED programs are designed to practice student peer-to-peer teaching and cooperative learning. More importantly, NEED's student-directed activities empower students to take active roles in educating their peers, families and communities about energy issues and in identifying and solving the problems unique to their communities.

The NEED Project workshops focus on developing a clear understanding of the science of energy and energy efficiency and conservation lessons to affect energy savings in the home. Hawaii Energy offers two types of workshops, the Basic Energy Workshop and the Building Science Workshop, to teachers from K-12 grade levels from all subjects. Workshops include training, sample curriculums and energy learning kits for teachers to use in their classrooms, along with professional development credit hours and reimbursement for a substitute teacher (or a stipend if the workshop falls on a weekend). Throughout PY14, 332 teachers across Honolulu, Hawaii and Maui counties participated in workshops, development meetings and hosted community events.

Energy Expos

Over 800 unique teachers have participated in the Hawaii Energy NEED offerings over the last four years, building a large group of engaged and informed teachers. Hawaii Energy's 2012 Evaluation, Measurement and Verification (EM&V) report recommended that these energy education efforts have a more direct connection to local residents, so the Program's PY14 efforts with The NEED Project focused on leveraging past participants to affect energy savings in the home. Hawaii Energy, NEED and teachers from the Hawaii Teacher Advisory Board (TAB) collaborated to pilot Energy Expos to engage the community. Energy Expos are student-led, teacher-hosted community events in which parents and community members learn about saving energy in the home. A total of seven Energy Expos with an estimated 600 attendees including parents, teachers, students, and local community members were held in PY14. These events also serve as a platform for students to showcase their learning and/or projects in energy education and to promote other Hawaii Energy offerings to ratepayers. The Expos received positive feedback from community members and school administrators.

Students and staff at Kalihi Waena Elementary played Energy Trivia at their Energy Expo this past May.

Teacher Advisory Board (TAB)

Hawaii Energy and The NEED Project staff convened the 3rd Annual Hawaii Teacher Advisory Board (TAB) meeting with seven motivated and experienced teachers. The purpose of the meeting was to evaluate progress in the last program year and generate ideas for future implementation. Hawaii Energy aims to develop more robust metrics and tracking systems and to directly tie teacher education to affecting Hawaii residents' home energy use. Therefore, the PY14 TAB meeting focused on mechanisms to deliver energy savings into students' homes. In addition to continuing to build on the successful Energy Expo model, during PY15 TAB teachers will pilot a project to distribute home energy saving kits through the classroom with an associated curriculum.

The Program selected and funded a teacher from Molokai to attend The NEED Project's annual National Energy Conference for Educators in July 2014 located in Long Beach, California. This teacher was able to delve deeper into the NEED curriculum with peers from across the country and learn from well-seasoned NEED teachers as facilitators, giving her the opportunity to bring her experience and lessons learned back to her school.

Hawaii Energy/RISE (Rewarding Internships for Sustainable Employment) Internship Program

The Program recognizes the need to prepare the next generation for jobs in the energy sector by having them provide meaningful work to organizations and to inspire them to enter the energy workforce. Therefore, Hawaii Energy teamed with the RISE Program operated by Kupu Hawaii to recruit, train and mentor 6 interns for energy workforce development. Through the RISE program, these college students and young professionals had paid internships working in energy conservation and efficiency in the Business, Residential and Transformational programs within Hawaii Energy. Each intern had energy industry professionals guiding them in their process. Their experiences were educational, inspiring, and they were able to contribute meaningful work that helped advance Hawaii Energy's goals.

Interns worked on a variety of initiatives including:

- Hawaii Energy's Small Business Direct Install Lighting (SBDIL) program, performing a total of 142 SBDIL post-inspections within Hawaii, Honolulu and Maui counties;
- Market research for Hawaii Energy's Residential Program to inform further program development;
- Support for Hawaii Energy's K-12 educational program, creating home and school assessment workbooks; and
- University of Hawaii energy efficiency project review and Green Revolving Loan Fund (GRF) research assistance in collaboration with the Sustainability Coordinator of the University of Hawaii System.

To close out the year, the interns gave final presentations and submitted final reports to summarize their experience, work performed and recommendations for how to expand programs to benefit Hawaii ratepayers.

Kupu RISE interns were required to assist with at least two community outreach events in order to practice handling customer inquiries and build public speaking skills. Above, Intern Ben Lillebridge assists Hawaii Energy Hawaii Island specialists at the Kona-Kohala Chamber of Commerce's Business Expo in April.

Interns reported,

"It was an absolute pleasure and incredibly educational. I have found passion in the industry that I will take with me and apply for the rest of my life. I'm deeply grateful."

"This internship has solidified my interest in furthering my knowledge in the energy efficiency industry."

"It's been an invaluable learning experience for me. I learned so much about the energy efficiency industry, and thoroughly enjoyed working alongside the intelligent and driven team at Hawaii Energy."

In the future Hawaii Energy will look for ways to cost-effectively expand the number of students who can participate and the diversity of projects that they support.

Facility Management Degree Program at the University of Hawaii West Oahu (UHWO)

As experienced professionals age out of the workforce and the responsibilities of facility managers continue to expands, ensuring that the workforce is educated and knowledgeable about energy efficiency and conservation is increasingly important. As such, Hawaii Energy continued to support the University of Hawaii – West Oahu (UHWO) and the International Facility Management Association (IFMA) development efforts for a new four-year Bachelor of Applied Science degree program in Facilities Management. The degree has been designed to appeal to full-time and working students interested in a career in facility management, primarily in the hospitality, government, office space, commercial retail and health industries. The degree program will also have credit and non-credit certificate options for existing facilities management professionals, including Building Operator Certification (BOC), Facility Management Professional and Certified Facility Manager® courses.

In PY14, Hawaii Energy provided funding to send a key University of Hawaii administrative leader to attend IFMA's World Workplace Conference & Expo for facility management in New Orleans. The conference was attended by faculty members from prestigious universities from across the nation as well as institutions in the Netherlands and Czech Republic. The valuable interaction with these institutions and the top IFMA executives helped to refine, reshape and accelerate the pace of the UHWO degree program development. Impressively, only three years after the first planning meeting in PY12, UHWO announced it will accept applications into the Facility Management degree program beginning in Fall 2015.

Hawaii Energy also co-sponsored two community outreach and fundraising events that were hosted by the Hawaii chapter of IFMA. The two events had a combined total of nearly 100 prominent Hawaii community and business leaders present. Participants represented diverse energy-related Hawaii industries including, but not limited to, engineers, contractors and property and facility managers. In PY15, Hawaii Energy will continue to provide support for the degree, in particular the integration of energy efficiency and conservation education into the curriculum.

Energy Efficiency Sales Professional Training

Educating professionals in energy efficiency sales and advocacy leads to greater end-user demand for efficiency projects because it draws the connection between energy efficiency and business profitability. It also allows sales professionals to be more effective at getting projects approved. Energy Efficiency Funding Group (EEFG)® is a training and education services firm based in California. Its principal, Mark Jewell, is a nationally-recognized expert on selling energy efficiency. In our fourth year working with Mark Jewell, the Program expanded the efficiency sales training offerings beyond in-person workshops to include new online courses and Hawaii Energy-organized special events.

In addition to his popular sales training courses, the Program presented Mark Jewell at a number of new events this year, including a C-level professional breakfast with Chamber of Commerce members and a special presentation for AOAO board members and property managers.

In-person trainings took place over two separate weeks throughout the year and included a variety of courses covering efficiency sales and financial analysis metrics. Overall, the in-person training series closed the year with a total participant count of 354. This included 235 unique individuals representing a diverse audience of 130 companies/organizations.

We also increased the number of courses available in the online library, including titles such as: *Financial Analysis of Energy Efficiency Projects, Communicating the Value of What You Are Selling,* and *Dispelling Myths and Objections to Build Rapport,*. The year closed with over 500 online course views by 103 unique individuals collectively representing a diverse audience of 80 companies/organizations.

To leverage Mark Jewell's extensive knowledge and industry experience, Hawaii Energy organized a series of special events during his in-person visits. Several hundred utility customers participated in the following events:

- Breakfast for business leaders sponsored by the Hawaii Chamber of Commerce on *Reframing Energy Efficiency as a High-Yield, Low-Risk Investment*
- Member luncheon organized by the HCCA (Hawaii Council of Community Associations)
- Specialized training with a large Clean Energy Ally's sales staff and key customers
- After-hours presentation and networking event for AOAO board members and property managers
- Networking event for past participants in Mark Jewell's training courses, the "Ninja Network"
- Briefing for University of Hawaii Foundation executives on investing in energy efficiency

In PY15, Hawaii Energy will continue to develop and refine our offerings for energy sales professionals and Clean Energy Allies.

Third Annual Hawaii Sustainability in Higher Education Summit

Hawaii Energy has continued to develop strong relationships with the University of Hawaii (UH) system in PY14. One aspect of this was continuing the financial and technical support for the Hawaii Sustainability in Higher Education Summit. The first event, held in PY12, exceeded its key intended outcomes and expectations, which included: (1) refining the draft UH System Sustainability Policy and (2) providing an opportunity for building cross campus collaborations by sharing insights and best practices.

At this year's Summit, UH President David Lassner released the UH Executive Sustainability Policy that set specific targets for energy efficiency and launched the UH System Office of Sustainability. Over three days, approximately 200 faculty, students, staff and community members to collaborated in work sessions and shared best practices on sustainability and energy. Hawaii Energy participated in panel discussions, co-facilitated breakout groups for facilities staff and arranged for energy expert Mark Jewell to deliver one of the keynote addresses. Hawaii Energy intends to continue to support this event and explore how to deliver additional technical trainings at this venue.

Green Office Program Development for Universities using Community Based Social Marketing (CBSM) Methodology

Hawaii Energy collaborated with Hawaii Pacific University (HPU) to design a Green Office Program to achieve energy savings through behavior change in universities using the CBSM methodology. HPU hired two interns to serve as "Energy Ambassadors" to perform research and develop a template for other Hawaii colleges and universities to use to achieve energy savings.

The project held the kick-off for their Green Office Program project at HPU's Hawaii Loa campus for 20 faculty and staff and two Energy Ambassadors on March 23rd. The kickoff event included two presentations by Hawaii Energy staff and generated interest and awareness about the importance of energy savings. Attendees had the opportunity to volunteer to become "Energy Champions" to help lead efforts for this campaign.

Hawaii Energy worked with a team that included two interns from Hawaii Pacific University to design and pilot the Green Office Program at HPU's Hawaii Loa campus in Kaneohe, Oahu.

During PY14, HPU Energy Ambassadors recorded energy usage observations during daytime and nighttime walkthroughs of the campus. These baseline observations helped inform the behavior selection process to improve energy efficiency in offices. Four behaviors were selected with the help of Action Research, the Hawaii Energy subcontractor for CBSM work. From this process, the HPU Energy Ambassadors created an initial template detailing how to implement an energy efficiency behavior change program. This document will be made available to share with other universities. In PY15, work will continue to complete the CBSM methodology and to finalize the guide in collaboration with Hawaii Energy.

Technical Training

Technical Training offerings target people who buy or operate equipment such as engineers, facility managers, architects, building operators and energy managers. These professionals have typically had experience in infrastructure and energy for a substantial portion of their career, but continue to benefit from enhanced technical skills.

Technical Workshops

Building Operator Certification (BOC©) Workshops

Hawaii Energy collaborated with the University of Hawaii at Manoa Outreach College (UHMOC) and Sustainable Living Institute of Maui (SLIM) to once again bring Level 1 Building Operator Certification (BOC®), the nationally-recognized energy efficiency training and certification program, to those working in commercial building operations and maintenance on Maui and Oahu. The workshops target the facility maintenance workforce to provide skills and knowledge to implement energy efficiency practices at their workplaces. 67 participants from resorts, the entertainment industry, and the University of Hawaii received their Building Operator Certification this year and these workshops have been well-received by the employers of the participants and demand for future sessions has increased. As such, the Program plans to expand the BOC offering to Hawaii County in PY15.

Hawaii Energy co-hosted a five-day seminar to prepare candidates for the Certified Energy Manager (CEM) certification test in May. More than 30 participants took advantage of the course, which included a study guide and built-in homework review sessions.

ASWB Engineering and Hawaiian Electric Companies (HECO)

Hawaii Energy co-sponsored a weeklong series of 10 technical training workshops with HECO for business customers, facilitated by David Wylie of ASWB Engineering, a California-based firm specializing in energy management consulting. Workshops covered a variety of topics, including HVAC, motors, demand response, power quality and energy efficiency surveys. The workshops had a total enrollment count of 384 participants including 96 unique individuals, collectively representing a technical audience of 64 companies/organizations.

Certified Energy Manager (CEM) and Energy Manager-in-Training

Hawaii Energy has worked with the Association of Energy Engineers (AEE) to hold training seminars and certification programs in Hawaii over the last four years. These programs continue to strengthen the workforce in Hawaii by improving skill sets and offering attendees the opportunity to gain the Certified Energy Manager (CEM) certification designation, which fosters their professional development.

In PY14, the Program hosted a five-day CEM Preparatory Seminar, which was a great success with 39 unique registrants, ranging from utility employees to state employees to military personnel. 22 participants went on to receive CEM certification and three received the Energy Manager-in-Training certification (and will be eligible for a CEM certificate once they have achieved requisite experience). Positive comments and feedback from the participants suggested that the course was very well-received. This year AEE added benefits to enhance the learning experience, including an additional hour each day to help participants with homework problems and questions, distributing study guides before the start of the training and a more interactive teaching style. The instructor was enthusiastic about the number of and caliber of questions the attendees asked and the course received positive evaluations from attendees.

Water and Wastewater Training

The Program continued its outreach and professional development efforts in support of the water and wastewater industry in PY14 by offering energy efficiency training to entry-level water and wastewater operators through the Sustainable Living Institute of Maui, as well as free training in Hilo for existing operators. Hawaii Energy organized the six-hour training in Hilo for 24 operators and engineers from both municipal and private water and wastewater systems. The training was presented by Rural Community Assistance Corporation's (RCAC) Kevin Baughman, a well-respected water circuit rider and former operator. The Department of Health approved valuable continuing education units for the full amount for the Hawaii Energy training material. In addition, peer group sessions were held in conjunction with RCAC on Molokai, Maui, and Kona for total participation of 48 individuals. These peer group sessions, while small in nature, gave private water operators an opportunity to "talk story" directly with Hawaii Energy and other state and federal entities that may be able to offer assistance. In addition, Hawaii Energy attended the Hawaii Water Works 53rd Annual Conference, the 2014 Water Reuse Conference, and presented at the American Water Works Association 2015 Pacific Water Conference. (For more information on other activities related to our water and wastewater initiative, see the "Energy Systems Integration Pilots" towards the end of the Transformational section.)

Food Service Trainings

Hawaii Energy brought in a team from Fisher-Nickel, Inc. ("Fisher-Nickel") to train professionals in Hawaii's foodservice industry on adopting energy efficient behaviors, techniques, and technology and to support the successful launch of our commercial ENERGY STAR® rebates for kitchen equipment. Fisher-Nickel, Inc. is a professional services firm with deep expertise in commercial kitchen energy efficiency and appliance performance testing. For nearly 30 years, they have provided the industry comprehensive and unbiased information about equipment energy use and performance through the development and execution of standardized test methods. Fisher-Nickel's team includes an experienced team of engineers, technicians, energy analysts and educators dedicated to helping the commercial food service industry better manage its utility costs through the utilization of energy and water efficient technologies.

Two of the four training sessions were co-hosted with the Chamber of Commerce of Hawaii, resulting in 45 participants. In addition, the Fisher-Nickel team conducted 10 commercial kitchen site visits (arranged by several training participants), which yielded additional inquiries about Hawaii Energy's business rebate offerings and the adoption of energy efficient behaviors.

Strategic Innovation for Energy Management

University of Hawaii

The University of Hawaii (UH) is one of the state's largest energy users. For the past three years, Hawaii Energy has strategically assisted in the design of a more comprehensive approach to energy management, which included support for planning, analysis, identification of priorities and helping overcome institutional barriers to getting projects implemented. The level of commitment from UH's senior administration and Board of Regents has increased with each year and more details in terms of design, funding, and staffing of such programs have been developed. Hawaii Energy support helps leverage the effort and enthusiasm of UH administrators, facilities staff, faculty, and students. With the passage of Act 99 this year, the University is now held accountable to the State Legislature for achieving net zero energy by 2035.

The Transformational program supported UH in the following ways:

- Sponsored a two-day energy efficiency training and site visit to the University of California San Diego, Irvine, and Los Angeles campuses for 24 University of Hawaii Facilities and Planning Department staff. Participants included mechanical and electrical engineers, project managers and architects. Training covered "right-sizing" projects, programmatic design for energy management, smart labs, submetering, monitoring-based commissioning, lighting and the Strategic Energy Partnership. Several attendees have since initiated projects based on what they learned.
- Provided technical support to review UH Manoa's campus energy use intensity (EUI) for buildings and to help identify next steps for energy efficiency planning.
- Hosted an executive breakfast in conjunction with the 3rd Annual Hawaii Sustainability in Higher Education for leaders from the UH System Office and the UH Foundation, community partners, and the Summit keynote speakers to explore energy efficiency as a low cost, high-yield investment and to determine next steps for establishing University-run green revolving loan funds. That breakfast resulted in unanimous agreement from participants to meet for a half-day work session to design the details of how such a fund would be launched and managed. The UH Office of Sustainability was charged with drafting a proposal and organizing the follow-up session.

The Energy Manager for the University of California Irvine discusses energy-saving strategies with facilities staff from the University of Hawaii on a site visit to their California campus.

- Supported the UH Manoa Office of Planning and Facilities and the Hawaii Natural Energy Institute in educating the university community about efficiency and developed recommended next steps toward achieving the University's energy reduction goals. This work included two educational workshops and a series of reports outlining the system's energy efficiency priorities, past actions, and milestones for energy initiatives. Additional reports provided summaries of the Hawaii Energy-sponsored site visit to the University of California and results of the 3rd Annual Sustainability in Higher Education Summit.

Out of this work a number of next steps have been identified for implementation in PY15, including the evaluation of pilot projects for the Green Revolving Fund, updates to the EUI technical review, and a community-based social marketing behavior change pilot.

Clean Energy Ally (CEA) Program

This year marked the introduction of the Clean Energy Ally (CEA) program, designed exclusively for industry professionals ("trade allies"). The CEA program was launched to identify and support those vendors, contractors, retailers, distributors, designers and installers who work closely with customers every day. The program objective is to recruit and motivate allies to become advocates of and active participants in Hawaii Energy programs, ultimately increasing the quantity of efficiency projects performed. PY14 successfully concluded with the recruiting, training and onboarding of 226 individual allies from 140 unique businesses.

In order to become a Clean Energy Ally, participants sign up through an online application process and attend Hawaii Energy Program training. Hawaii Energy offers specialized support to our Clean Energy Allies including professional development courses, technical assistance on complex and customized projects, training on Program practices and co-branded marketing opportunities. Professional development sales training courses led by Mark Jewell of EEFG, Inc. and technical trainings such as Building Operator Certification and Certified Energy Manager courses were a few of the opportunities that were offered to Clean Energy Allies in PY14.

This program year, Hawaii Energy hosted a number of networking events for our Clean Energy Allies. We designed these events so CEAs could mingle with utility customers and other vendors with whom they can partner to cross-sell and up-sell energy efficiency products and services. Highlights included a "Step into Spring" Chamber of Commerce business networking event and a specialized efficiency sales training for HVAC professionals.

As another benefit for the Clean Energy Allies, Hawaii Energy has designed an online vendor directory with their business information and links to their individual websites. This business directory makes it easy for utility customers to connect with Clean Energy Allies, as customers can filter their searches by technology, services, market sector or location to identify the right service provider to meet their needs.

As valued ambassadors in the field, we will continue to support CEA efforts. The program is expanding in PY15 with additional trainings, networking opportunities and ally assistance.

Energy System Integration Pilots

In Program Year 6, the Public Utilities Commission asked Hawaii Energy to expand the energy-efficiency box and tackle challenges of integrating demand side management with several complementary areas that are critical to achieving Hawaii's clean energy goals. This request spurred market research and five pilot projects that required the application of engineering and data analysis skill sets and break-through collaborations with Hawaiian Electric Company (HECO) and other groups. Pilot work focused on smart grid, codes and standards, electric vehicles (EV), demand response and benchmarking. Hawaii Energy is also investigating the intersections of these currently independent topics as we develop a more strategic approach to energy management in the Islands. More details about each of these pilots, as well as our continued efforts in the water/wastewater sector, follow in the section below.

Market Research

In PY14, Hawaii Energy conducted market research on a variety of topics in order to inform the design and development of our energy system integration pilots. The Program subcontracted with QMark, a local market research company, to perform both qualitative and quantitative market research through various methods, including surveys and focus groups, on Oahu, Maui, Kona, and Hilo (for additional information on the market research study, see the Marketing and Outreach section, pg. 163). Research topics included smart grid, demand response, Time-Of-Use (TOU), and electric vehicles. Hawaii Energy conducted its own market research surrounding codes and standards. A sampling of interesting findings is listed below:

QMark

- The awareness of smart grid technology is minimal and based on the term "smart grid" alone, participants could not guess what the idea entails. After the concept was explained, some participants understood how the technology could be beneficial in empowering people to manage their energy consumption.
- When the research study discussed the "Demand Response" concept, less than 12% of all respondents were familiar with the term. Across all counties that were polled, over half of the respondents expressed interest in the DR concept, citing their top reasoning due to openness to the concept, saving money on their electric bill, and their desire to lower their energy use. Many participants felt strongly that control over their appliances could eventually lead to further manipulation of their overall electrical usage.
- Nearly a third of respondents in the market study recognized the term, "Time-Of-Use rates" and over half expressed interest in the concept. Through the focus group, participants echoed the inconvenience of altering their lifestyle to avoid peak pricing. Some participants did note that they could see some changes to their daily habits in order to save money on their electrical rates.
- A vast majority of EV owners, primarily charge at home (72% overall) and interest in using public charging stations varied from county to county with the most positive feedback coming from Honolulu. Although the sample size was relatively small, EV owners noted that "helping the environment" and "overall cost savings" were perceived as positive characteristics of ownership. The expansion of charging stations was also noted by the group, but many still felt there were not enough to meet the current demand.

Codes and Standards Market Pulse

The Hawaii Energy market research for energy codes and standards was informed through meetings with diverse professionals at the State Building Codes Council (SBCC) and IECC 2015 Investigative Committee meetings. Attendees include county building officials, State Energy Office code officials, representatives from the American of Institute Architects, U.S. Green Building Council, Structural Engineers Association of Hawaii, home developers, building designers, and members of the public.

The Program presented findings that showed how new homes' energy consumption significantly exceeded the current energy code requirements. We learned from one home developer that energy efficient equipment was expected by buyers, though not favorable when it increased home cost. In the commercial sector, it seemed there was little conversation when it came to following energy code; yet standard practices often meet or exceed energy efficiency code by design.

The Program stayed abreast of the advancement of energy code and the industry's perspectives through the SBCC. The PY14 Codes Compliance Study has also identified challenges that designers face in knowing which performance information to include on plans, details of county amendments, specific sector concerns, and technical component intricacies.

Smart Grid Pilot

This year Hawaii Energy was tasked by the Public Utilities Commission to support the Smart Grid Initiative and collaborate with HECO on its initial smart meter project in Oahu. The goal was to provide demand side energy efficiency enhancements, utilize the smart meter data and accelerate the development of Home-Area-Networks (HAN) in smart grid homes so customers can benefit from smart meter technology. A Home-Area-Network is a network of energy management devices and applications within a home environment that enables two-way communication between residents and the electric utility. HAN not only plays a key role of customer engagement in implementing home energy management systems (HEMS) and DR, it can also provide more TOU and distributed generation (DG) capabilities.

The recent market survey conducted by QMark on behalf of Hawaii Energy has identified customer engagement as a significant challenge for smart grid in Hawaii's utility industry. The survey also noted that awareness of smart grid technology is almost non-existent among the general population in Hawaii. Therefore, the program decided to launch a small scale of HAN Pilot "Smart Home" to gain field experience of HAN applications with customers before HECO initiates the next phase of smart meter deployment.

Hawaii Energy subcontracted CEIVA Energy and selected its ZigBee-compliant In-Home Display (IHD) as the pilot device. CEIVA Energy has extensive experience in successfully deploying HAN devices such as IHDs, load controllers and smart thermostats in many projects across the country. CEIVA is also one of the few HEMS solution providers with the ISO 27001 Information Security certification, the highest form of security standards in the industry. CEIVA's IHD is a cloud-based smart picture frame that connects the smart meter to a Wi-Fi network and can provide energy information, energy conservation tips and utility messages all in near real-time (updated up to every six seconds). In addition, it supports over-the-air updates and can be deployed conveniently with no technical installation required from the customers. "Smart Home" was the first collaborative pilot project between HECO and Hawaii Energy. While Hawaii Energy was responsible for providing HAN devices, customer recruitment and engagement, HECO's DR team assisted in pre-testing and connecting HAN devices to the smart meter and coordinating its advanced metering infrastructure (AMI) vendor Silver Spring Networks to support the HAN communication.

Hawaii Energy mailed offers to participate in the pilot to 980 smart meter customers in the Kahala and Diamond Head areas – two neighborhoods chosen jointly by Hawaii Energy and HECO for recruitment. Of the 52 respondents, 44 qualified customers received a CEIVA IHD to monitor their energy usage so they could make informed decisions to lower their energy bill and experience HEMS during the pilot period. After two months, surveys were distributed to solicit feedback from participants.

Shown here is an example of CEIVA's Home-Area-Network capabilities. CEIVA's platform connects the smart meter information to the internet, providing near real-time energy information via in-home display, as well as a mobile app and web portal. It can also communicate with smart plugs, thermostats, load controllers, and even electric vehicles and PV systems, allowing customers to manage their energy consumption and generation conveniently. The Hawaii Energy pilot only deployed in-home displays due to time and budget limits.

Participants in Hawaii Energy's "Smart Home" Pilot received in-home displays, access to the CEIVA mobile app, HEMS service and energy saving tips from Hawaii Energy to manage their energy usage.

Some feedback from the Pilot participants:

"This is a great tool that has shown me a realistic breakdown of daily electricity usage."

"It's working great. Find myself moving the IHD from room to room, turning off and on stuff to determine the energy impact during my spare time."

"I can tell you that real-time energy information did change my thinking about energy."
– (Anonymous Hawaiian Electric employee)

"One night I had both split air units going, I was pedaling my bike and the IHD told me that my bill was projected to be $1,341. I almost fell off the bike. I thought I had an electrical leak somewhere...So I figured out the IHD was telling me if I used energy everyday like how I was using that night my monthly bill would end up to be that high!"

Key Findings

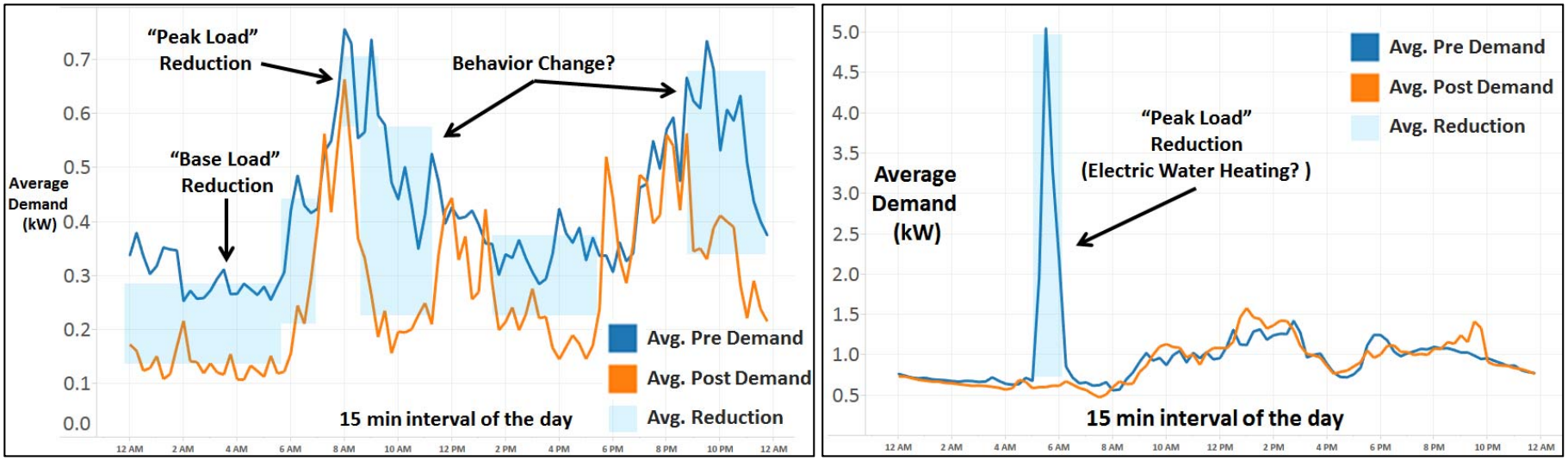
After two months with the IHDs in the home, the key findings of the initial EM&V analysis and survey are summarized here:

- As of PY14, 38 of the 44 participants have tried to connect their IHDs. For the 14 participants who never had any connection problems, the pre/post analysis showed an overall reduction of 4% relative to control neighbors.
- 86% of respondents prefer using IHDs over mobile apps to view their energy information and believe the real-time energy information is helping them to know their energy usage better. 14% of respondents prefer using mobile app and none prefer using web portal to view their energy information.
- The Program observed some significant changes among the participants by comparing the pre/post load profiles (see **Figure 9** for two examples). To evaluate the IHD impact and to gather more insights on user reactions to the real-time information, Hawaii Energy will engage with the participants and provide further long-term validation report in PY15.

In most cases from other utilities, Zigbee mesh network has shown to be a reliable technology for utility energy management solutions in the grid. However, after few weeks of IHDs deployment, Hawaii Energy began to see incidents where something was causing some of the IHDs to drop communication with the SSN meter. To investigate the problems, Hawaii Energy, CEIVA Energy, Silver Spring Networks and HECO formed a special task force to attempt to recreate the scenarios causing the incidents. After thirteen weeks of collaboration, the task force successfully solved the connection issues with CEIVA's dedicated support and continuous coordination from SSN. Lessons learned highlighted the importance of following proper HAN provision processes, understanding SSN's unique smart meter logic for HAN communication protocol, changing Zigbee channels to avoid the radio frequency interference in the home, having robust in-field testing and energy-service interface reboot impact.

In conclusion, although the pilot encountered several technical issues and it took some time for the Program to break through the barriers to conduct this first cross-party collaborative project, the field experience gained was invaluable and will be a stepping stone to help the Program, HECO and AMI/HAN vendor roll out smart grid and demand response programs smoothly in the future. The initial result was limited by the sample size but it demonstrated the benefits of in-home devices and mobile applications in getting customers involved in smart grid development. Building upon the lessons learned from PY14, Hawaii Energy will continue to collaborate with HECO Smart Grid/DR team to enhance HAN implementation of the smart grid benefits to customers.

Figure 9
Sample Pre/Post Customer Load Profiles During Smart Grid Pilot



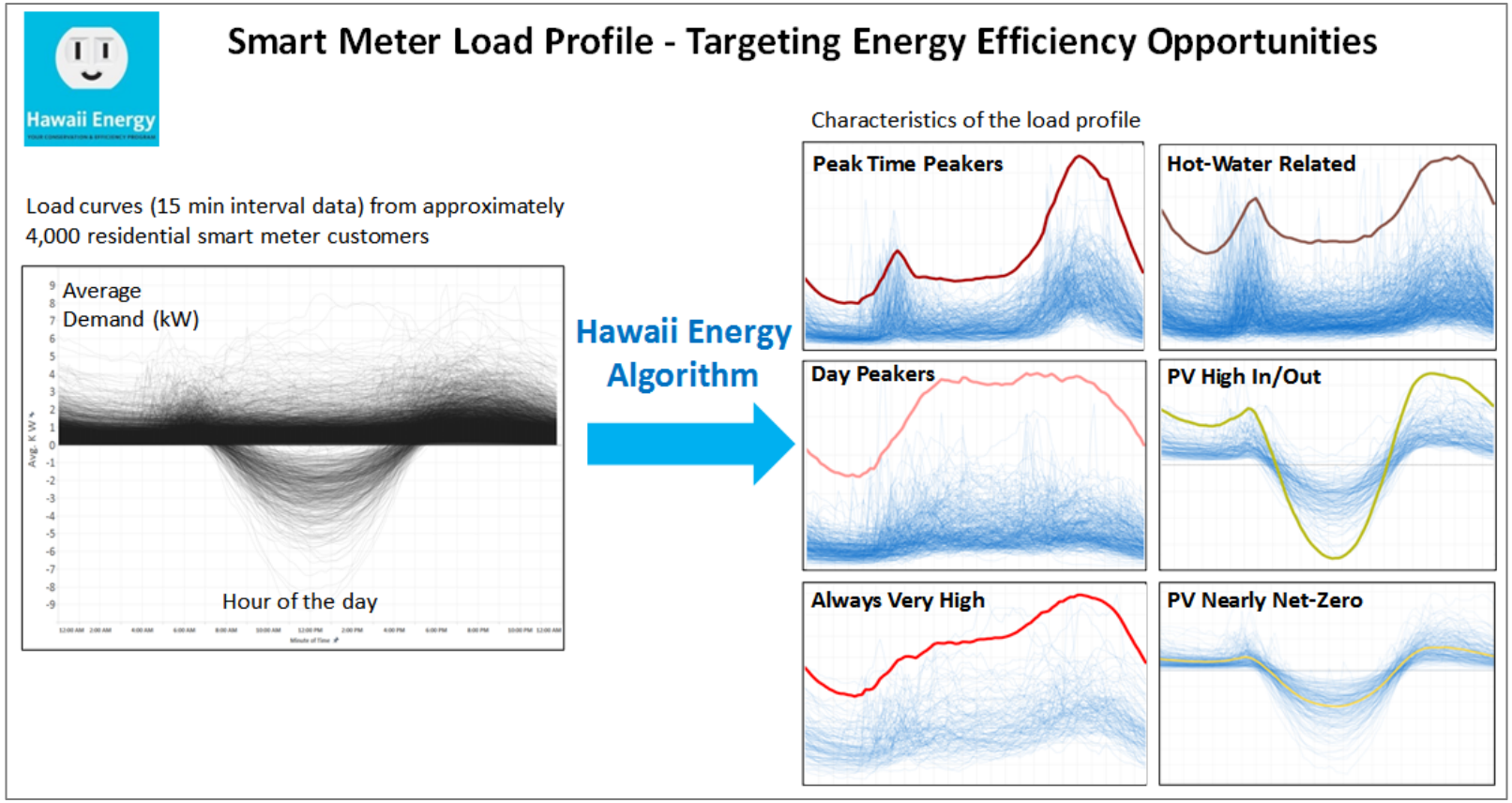
Above are two examples of average daily load profile change compared to the same period last year. Both customer profiles show reductions in energy usage; however, the profile on the right shows a drastic reduction during a short time frame, which could indicate a water heater replacement of some sort.

HECO Smart Grid Phase-0 Meter Data Review

In PY14, Hawaii Energy also developed the capacity to leverage the existing smart meter data and advanced analytics in a variety of ways. This included developing big data mining, cleansing, and interactive visualization techniques that allow Hawaii Energy to target customer segments, increase customer engagement, and dynamically measure savings to drive and evaluate energy efficiency actions. By utilizing 15-minute interval data in HECO's Smart Grid Phase 0 Pilot, the Hawaii Energy team has developed an analytic algorithm to identify the customer load profile characteristics in order to determine the potential for the Program to increase energy efficiency and renewable integration (see **Figure 10**). This load profile analysis can provide valuable insight for market segmentation and is essential when designing TOU rates.

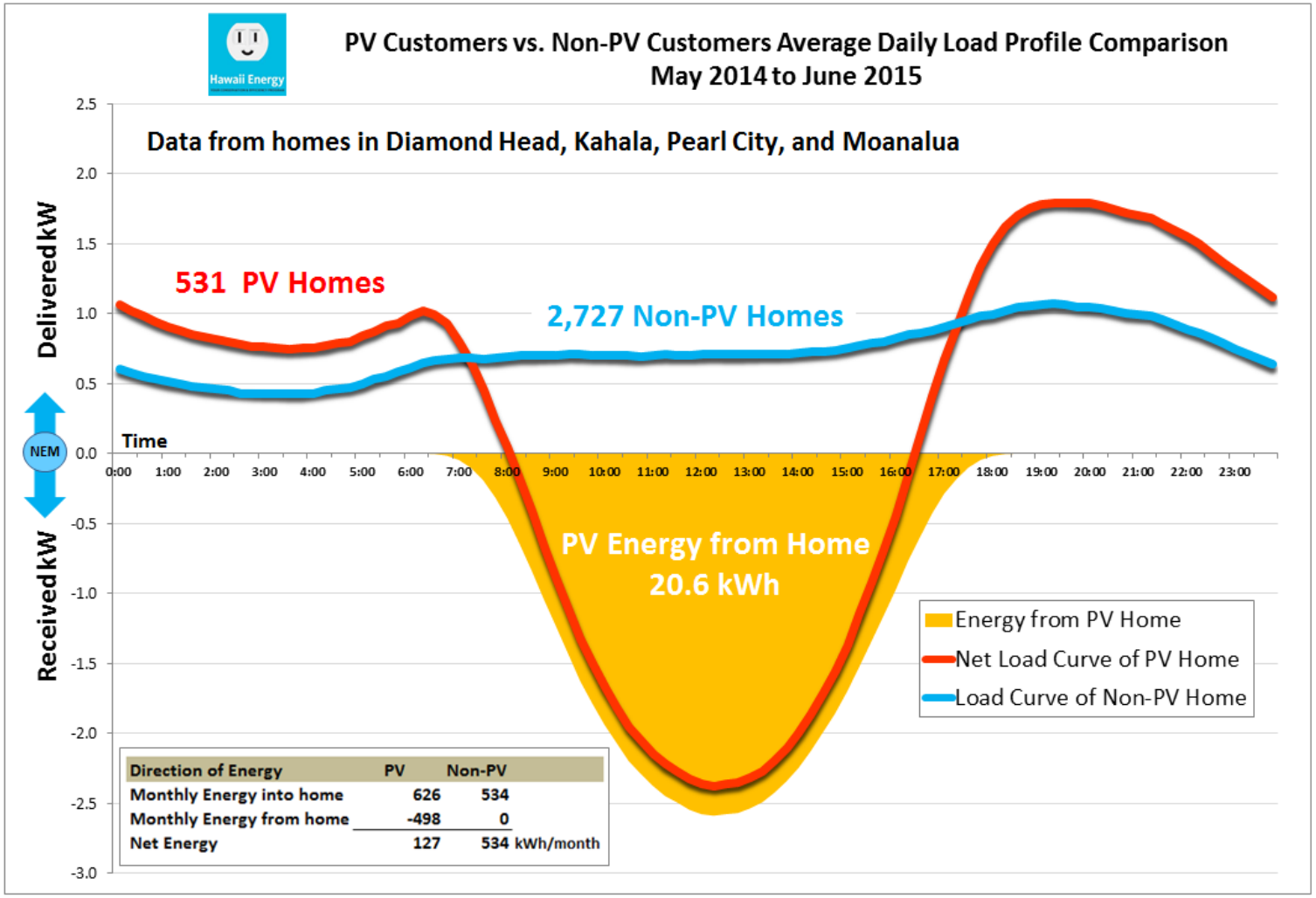
Capitalizing on these efforts, Hawaii Energy was able to assist the Division of Consumer Advocacy to better understand the consumption characteristics and behavior of PV customers. **Figure 11** shows the average daily load profile comparison for PV and Non-PV customers based on the available smart meter data in Diamond Head, Kahala, Pearl City and Moanalua. It appears PV customers are, on average, having higher demand in the evening and morning than non-PV customers.

Figure 10
Characteristic Identification of Smart Meter Customers Using Hawaii Energy Algorithm



Left: 4,000 average daily load curves from residential smart meters. Right: Characteristics identified by Hawaii Energy's algorithm.

Figure 11


PV Customers vs. Non-PV Customers Average Daily Load Profile Comparison
May 2014 to June 2015
Data from homes in Diamond Head, Kahala, Pearl City, and Moanalua
Delivered kW
Received kW
NEM
Time
531 PV Homes
2,727 Non-PV Homes
PV Energy from Home
20.6 kWh
Energy from PV Home
Net Load Curve of PV Home
Load Curve of Non-PV Home
Direction of Energy | PV | Non-PV
Monthly Energy into home | 626 | 534
Monthly Energy from home | -498 | 0
Net Energy | 127 | 534 kWh/month

Codes and Standards Pilot

The EnerNOC Potential Study identified energy codes and standards as a large factor in the future of energy efficiency in Hawaii. In addition, Hawaii Energy conducted a market review of current codes and standards conditions, which was informed through meetings with diverse professionals at the State Building Codes Council (SBCC) and IECC 2015 Investigative Committee meetings (refer to Market Research Section above for more information). In the PBFA territory of Hawaii, Honolulu, and Maui counties, all islands are currently bound by IECC 2006 standards, although many builders already build above minimum code requirements. In fact, each county in the state is currently exploring the possibility of adopting newer energy codes. In order to progress in terms of better buildings, Hawaii Energy believes that it is necessary to understand the current state of code compliance. The PY14 codes and standards pilot was created to accomplish these tasks. From this knowledge, the Program aims to create an incentive program for designers and builders to exceed minimum code requirements.

The PY14 codes compliance study was designed to build upon a 1999 DBEDT Codes Compliance study. Similar to the 32 plans reviewed at that time, 40 building plans across three counties were planned for the PY14 study. Kolderup Consulting was selected for the work, which consisted of three tasks:

1) Review commercial building plans from Honolulu, Maui and Hawaii counties for energy code compliance.
2) Conduct a field study comparing actual installed equipment with construction plans.
3) Create a form to assist designers and code examiners with codes compliance, and provide a method for Hawaii Energy to incentivize above-code achievement.

Key Findings

At the close of the year, we had successfully provided Hawaii and Maui counties with a report on the level of energy code compliance in planned commercial buildings. This report is the first step in assisting counties, and ultimately building designers, in meeting and exceeding Hawaii's building energy code. Designing the project, conducting the study, and finalizing the report within a single Program year was a challenge. Onboarding a new subcontractor, Kolderup Consulting, took more time than anticipated due to State documentation requirements. Once work was underway, the Program made key introductions to assist in gathering building plans from the three counties.

For Maui county, electronic copies were available and online access was provided to the consultant to review plans. For Hawaii County, hard-copy building plans were reviewed on-site at the county permitting office. The electronic approach was more effective, though both worked well and complete data was gathered from both counties. Honolulu County was unable to submit plans to the consultant for inclusion in the PY14 report and will be presented in a PY15 report. After multiple requests, the Honolulu Department of Planning and Permitting (DPP) did not provide a contact person to provide requested building plans. Several personnel were in communication with the consultant but ultimately no plans were delivered nor schedules coordinated for on-site review of plans. Tasks 2 and 3 will benefit from the information gleaned from Honolulu County and will also be included in the PY15 report.

Despite the challenges, several important lessons were learned through this pilot and key takeaways have been identified that lay the foundation for continued codes and standards work in PY15. The table below compares the 1999 and 2014 studies. Compliance has decreased in some areas primarily due to missing information on plans. Improvement in compliance can be attributed to industry practices leading code, for example in HVAC cooling efficiency where equipment that is currently available on the market will meet minimum 2006 IECC requirements.

Figure 12
Comparison of Energy Code Compliance Rates in 1999 vs. 2014

	1999 Study Compliance rates		Notes	2014 Study Compliance rates		Unknown	Notes
Lighting Power Compliance	87%	22/32		53%	10/19	5%	Track lighting & missing specifications
Lghting Controls	44%	14/32		-	-	-	
Exterior Lighting Power	-	-		75%	9/12	8%	
Roof Insulation Compliance	78%	14/18		33%	4/12	58%	Missing specifications
Wall Insulation Compliance	82%	14/17		83%	10/12	17%	
Fenestration	N/A	N/A		8%	1/13	85%	SHGC could not be verified: window specs not included on construction documents.
HVAC Cooling Efficiency	42%	11/26	Most non-compliance due to info missing from plans; excessive cooling capacity in restaurant & retail.	80%	12/15	20%	Currently available equipment will meet 2006 IECC.
Water Heating Compliance	39%	9/23	Specifics missing from plans (circulating systems, insulation, heat recovery, etc.)	53%	8/15	-	Specifics missing from plans (circulating systems, insulation, heat recovery, etc.)
Building Official Reports	Issue areas: Track Lighting and Cooling of unenclosed spaces			-	-	-	-
Design Professional Reports	Lighting power limits have greatest impact on design. HVAC design unaffected by IECC 2006 except for unenclosed spaces. Building officials provide few comments or feedback regarding energy code.			-	-	-	-
Areas of Concern	Small Retail Lighting			Small Retail Lighting			
	Lighting Controls			HVAC			
	HVAC			Insulation			
Recommendations	Training			Performance Information Guidelines for Plans			
	Staffing			Increase Awareness			
	Information Materials & Compliance Tools			Compliance Guidelines Incentives			
	Code Modifications			Guidance for window compliance			
	Plan Review Process Modifications						

The overall takeaway from this pilot is that current energy code compliance is mostly unknown due to a lack of information available on plans submitted. Key unknown areas include roof and wall insulation, window solar heat gain, HVAC cooling efficiency and duct insulation, and HVAC commissioning plan instructions. Interior lighting power has a high rate of non-compliance due to improper accounting for track lighting and missing specifications for lighting fixture input power. This was a previously unquantified issue that has been prioritized for action. Also, lack of awareness of county-specific energy code amendments was a recommended area to be addressed, including specific areas such as the commissioning-plan requirement.

As of this writing, the PY14 Codes Compliance study has been presented to the DBEDT energy codes team and to the SBCC. Copies of the report have been delivered to the county building officials and the Program will continue to work with codes officials and the industry to provide training and compliance forms.

The Program looks forward to completing the Honolulu study with the consultant in PY15, continuing with Honolulu building official contacts for the compliance and field studies, and utilizing Maui and Hawaii results for the compliance checklists. With the SBCC approved IECC 2015 for Hawaii, the Program could provide advice or an incentive for progressive buildings achieving IECC 2015 before the new code is adopted.

Electric Vehicle Pilot

Across the country and especially in Hawaii, electric vehicles (EVs) are growing in popularity. The addition of more and more EVs in the state will have a significant impact on the electric grid. Depending on financial incentives, consumer behavior and the development of infrastructure to provide charging capability outside of the home, EVs have the potential to become a valuable grid resource. Specifically, residential loads that correspond with peak demand could be decreased by shifting some EV charging loads to times of excessive PV and wind generation. Conversely, without deliberate planning and action, these vehicles could contribute to grid instability. For these reasons, Hawaii Energy created a pilot study to explore some of the issues related to EVs. The electric vehicle pilot had three main components: 1) a daytime charging study, 2) distribution of energy efficiency kits and 3) the development of an EV website to serve as a resource for potential purchasers.

Daytime Charging Study

The primary purpose of the study was to test technologies and rate tariffs that would encourage the use of EVs as a value proposition to potential vehicle owners and to support grid efficiency. Hawaii Energy collaborated with members of the EV Partnership group and Hydrogen Fuel Cell & Battery Electric Vehicle Stakeholder Charrette to determine the best course of action to improve integration of EVs as a grid resource. The working group represented EV dealerships, EVSE providers, EV owners, non-profit entities, the local utility, and government organizations. Ultimately, the Program developed and executed a daytime charging pilot that utilizes multiple charging stations throughout a network of locations to determine the feasibility and acceptance of day time charging as a load shifting mechanism. It was hypothesized that discounted charging rates could be used to encourage load shifting to times of high renewable energy penetration throughout the day. Hawaii Energy targeted EV owners that also had NEM accounts in order to promote daytime load-shifting awareness among PV system owners.

Key Findings

Findings from the study can be summarized with the following:

- Customer interest has been piqued, but was not reflective in discount charging sessions. Introducing the 40% discounted charging rate resulted in response rates that were slightly above the industry norm with 5.2% click-through rate for email marketing. Initially, 54 participants (from a pool of over 1400 members in the OpConnect charging station network) were eligible to receive the offered discount via an online registration form. Despite a quick uptake from OpConnect members for the introductory offer, the addition of the 60% discount resulted in no additional interest from members. Also, as the promotional discounts went live, a total of 38 discount sessions were logged during the three-month period, representing only 1% of all charging sessions that were eligible for discounts. Furthermore, the number of discounted sessions slightly decreased from March to May, depicting no significant increase in charging by participants receiving a higher discount rate.
- Customer feedback is essential. Feedback from participants cited the "inconvenience" of charging throughout the day as compared to at home. Additional confusion over the limited time period for charging left many potential and active participants perplexed by the discount promotion. Others lamented that the availability of charging locations was also prohibitive as well as the high cost (as compared to NEM credits and standard electricity rates). One OpConnect member contacted Hawaii Energy to clarify the discounted price, noting that with the cost still remaining slightly over the retail cost of electricity, the benefit to the consumer was unclear. A further discussion on the merit of grid efficiency and the role of EV charging result in the following response:

> *"I think getting folks to charge during PV peak times is an awesome idea! I wish there was a (utility) plan for that. Right now if I opt in to the (utility) EV plan, charging during peak would be way more expensive. This offer did make me think about my charging habits. Maybe I should charge our car at noon instead of 9pm."*

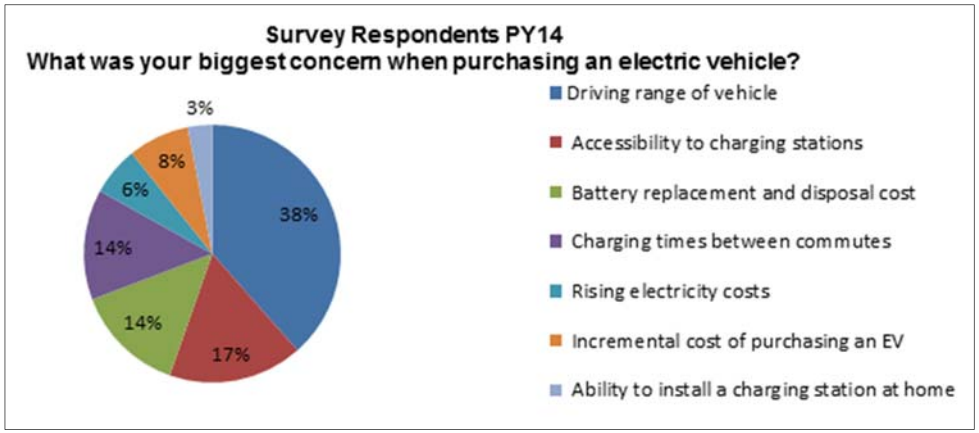
Many important lessons were learned as a result of this pilot project. Initially, Hawaii Energy planned infrastructure improvements such as installing charging stations or EVSE to encourage workplace charging in strategic locations. Upon further analysis it was determined that the inclusion of key stakeholders (building management, building owners, utility, contractor, and EVSE supplier) meant the time sensitive process of siting, designing, and constructing would be prohibitive for execution within the time allotted.[1] Moreover, national industry trends revealed that the effects on grid stability could become troublesome as EV adoption increased without considerations for optimal vehicle-grid integration (VGI).[2] Finally, revised rates for EV TOU rates are currently being proposed to incentivize daytime charging for EVs. Through efforts by the local utility, it is being developed in parallel with expanding the fast-charger network in the County of Honolulu.

Although response to the discounted EV charging pilot rates was not high, future pilot studies could explore the use of multichannel marketing to better reach EV owners. It was found that adjusting the pricing mechanisms to better reflect the market demand for daytime charging might be a challenge for customers who already see public charging as "inconvenient" and "costly." Augmenting off-peak charging will also require effective messaging and feedback, to express the value to targeted audiences and utilizing the communication forms they are most comfortable with. Lastly, advanced features such as throttling and vehicle-to-grid (V2G) services may be on the horizon, but incentivizing EV owners to participate will require careful consideration for the same barriers discussed above.

Energy-Saving Kits

An additional action that Hawaii Energy took as part of the EV pilot was to create home energy-saving kits for EV purchasers. From December 2014 to June 2015, Hawaii Energy offered free kits to help new EV owners offset the increase in energy consumption from charging their EVs by installing energy efficient devices in their homes. In order to receive their energy-saving kits, customers registered online or in person after purchasing or leasing a new plug-in EV from a participating dealership. It was requested that participants eligible for the EV kits complete a short survey in order to assist the program with providing useful information for potential EV owners. As a result, participants identified their top two biggest concerns with purchasing an EV as the "driving range of the vehicle" and "accessibility to charging stations" (See **Figure 13** for details). In a market study conducted in PY14 by Hawaii Energy, respondents who did not own a hybrid vehicle or EV perceived "initial vehicle cost", "cost to replace batteries", and "access to convenient charging stations" among the top three obstacles to ownership of an EV. Hawaii Energy plans to continue the success of the energy-saving kit offer for EV owners in PY15 with a new online storefront for fulfillment.

Figure 13
EV Participant Survey Sample Response



[1] *Plug-In Electric Vehicle Handbook for Workplace Charging Hosts.* NREL. U.S. Department of Energy, Clean Cities. August 2013. http://www.afdc.energy.gov/uploads/publication/pev_workplace_charging_hosts.pdf

[2] Martin, J. *Grid-Integrated Fleet & Workplace Charging for Plug-in Electric Vehicles.* SDG&E. Presented November 18, 2014. http://energy.gov/sites/prod/files/2014/12/f19/Session3B_Martin.pdf

Website

Finally, Hawaii Energy launched a new section within its website devoted to providing information about electric vehicles (https://hawaiienergy.com/for-homes/ev). The page includes a cost comparison of electric vehicles to conventional vehicles, descriptions of different types of electric vehicles, and factors to consider before purchasing an EV, as well as some frequently asked questions and additional resources. Hawaii Energy plans to continue its outreach efforts to raise awareness of energy efficiency as it pertains to electric vehicles in PY15.

Demand Response (DR) Pilot

In June of 2015 the landmark bill HB 623 set a path towards 100% renewable energy by 2045 for the State of Hawaii. With increasing levels of variable renewable energy integration on each island's grid, there is a greater need for coordinated efforts that provide load control to balance the grid. In PY14, Hawaii Energy studied the potential for integrated energy efficiency and DR solutions for the residential market. The purpose of the study was to assess the effectiveness of load control of a heat pump water heater (HPWH) as a means to support grid stability. Water heaters are the primary resource for residential demand response, since they are designed to heat water and then store it for later use.

Hawaii Energy reached out to Kanu Hawaii for collaboration. Kanu Hawaii is a local organization that boasts a large membership and a track record of collaborating with Hawaiian Electric Company as well as third-party research institutes. In fact, Kanu Hawaii already had experience in installing grid-interactive water heaters in residential settings. Their prior experience enabled them to offer field installation, providing seamless customer support when troubleshooting monitoring and communications equipment. Hawaii Energy staff acted as the project lead as well as afforded technical support and data analysis. Ten participating homes were chosen for the pilot. Each home had an existing standard electric resistance water heater (ERWH), which allowed Hawaii Energy to collect baseline data on water and energy consumption, as well as instantaneous power demand. A heat pump unit was added to the existing electric water heater, as well as low-flow faucet fixtures. Next, data was collected on the HPWH under normal operating conditions to demonstrate the relative efficiencies of the two technologies. The final phase of testing involved the addition of curtailment events, where the HPWH was disabled during peak demand periods, thereby shifting the load to non-peak periods. Curtailment events were initially scheduled for four hours (5-9 PM), and then extended to 13 hours (5 PM to 6 AM).

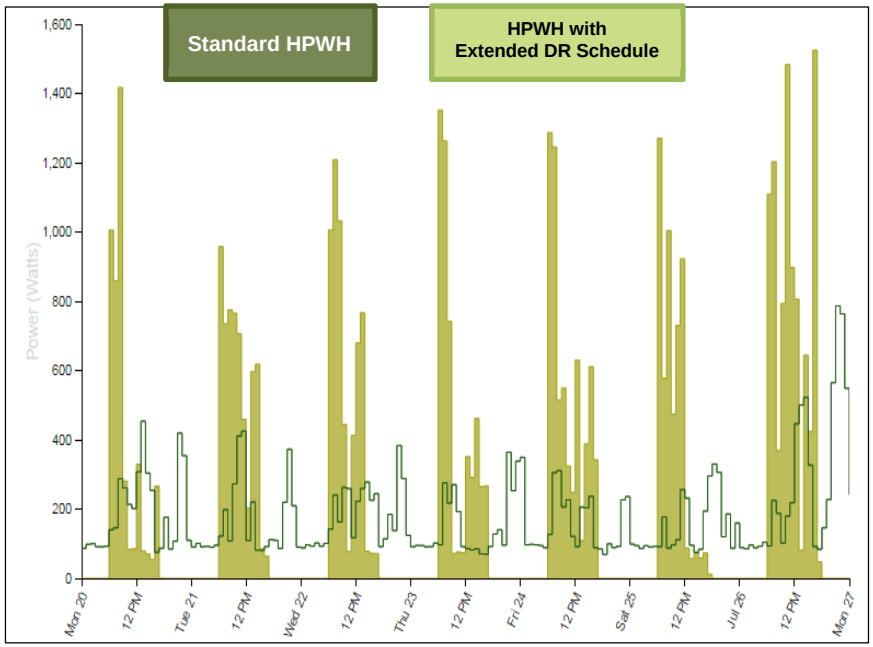
Key Findings

Evaluation of the pilot study resulted in energy and demand reductions for typical residential households when traditional ERWH was replaced with DR-enabled heat pump water heating. Installing the auxiliary HPWH and low-flow fixtures at four metered sites resulted in an estimated energy savings of around 2.7 kWh/day or 46% as compared to the 24-hour ERWH baseline. It was estimated that the electric demand changed from 4500W for the ERWH to an average of 844 W for HPWH across all sites. With the addition of the 5 P.M. to 6 A.M. curtailment schedule, HPWH DR load increased to average peak of 1166 W across four monitored locations. This recovery period was indicative of a snapback effect which should be considered if load control is implemented on a larger scale or on critical circuits. Also, due to the power reduction of the HPWH, longer runtimes were needed to meet the same hot water usage demand previously met by the ERWH. Standard ERWH high-demand heating elements would run for approximately 6% of the day, while the standard HPWH recovery rate would be active at least twice as long. Therefore a larger portion of the HPWH load coincided with the evening peak, but the addition of curtailment scheduling would shift this demand to the solar day, when renewable energy is plentiful.

This study concluded that load control was successfully demonstrated, but improving the energy efficiency by retrofitting the ERWH with HPWH reduced the magnitude of curtailable load. **Figure 14** demonstrates the extended curtailment schedule of shifting the water heating load for four participant households into the period of excess renewable energy.

There were many lessons learned from this pilot project and future areas of study. For example, additional energy savings from the cooling load (provided as a byproduct of the HPWH water heating process) was not determined, but should be investigated further for cases where existing or potential cooling is displaced. Interestingly, participants reported only two instances of water temperature fluctuations throughout a study period spanning 90 days of load shifting events with 4-hour and 13-hour durations. Thus, it was concluded the slower recovery rate of the HPWH is suitable for typical household water usage. It is advised that the long term effects be examined in order to determine if the HPWH units continue to achieve similar energy savings throughout all months of the year.

Figure 14
Ibis Networks' Online Dashboard Reporting Heat Pump Loads



Curtailment schedules through an IntelliSocket and gateway allowed load shifting away from peak demand periods of 5 P.M. to 9 P.M and an extended period of 5 P.M. to 6 A.M. The HPWH baseline indicated by lower demand profile outlined in dark green and the HPWH with the extended DR scheduling indicated in light green.

A customer education program was determined to be beneficial to programs considering DR-enabled HPWHs for the residential sector, as added maintenance requirements and slower recovery rates are inherent to most units. Participants in the pilot study were not notified of the precise timing of when units were scheduled to be "off", but feedback remained relatively positive throughout the duration of the pilot study. As with other existing residential direct load control programs, hot water service disruption has such a drastic impact on household activities. It should be carefully weighed what level of compensation is fair for the customer and the local utility. If considering long-term participation in a residential direct load control program, infrequent feedback following an event may potentially act as a deterrent for continued customer engagement.[3] Ultimately, participants were allowed to keep the HPWH, but no additional compensation was provided to the households for their demand reduction during peak periods. Therefore the impact of appropriate customer compensation was excluded from our study, but should be explored for DR participation in the future.

Moving forward in PY15, Hawaii Energy has committed to a demand response initiative for a new construction project in leeward Oahu consisting of 499 rental apartments, each with electric water heating. This is in support of efforts by Shifted Energy, HECO and the developer to coordinate the installation of grid-interactive water heaters.

[3] Faruqui, A. *The impact of informational feedback on energy consumption -- A survey of the experimental evidence.* http://www.uvm.edu/sustain/sites/default/files/faruqui2010_impactoffeedback.pdf

Benchmarking Pilot

The high cost of energy coupled with an increased awareness of energy efficiency and conservation often leads to building owners recognizing the need to reduce their energy costs. Benchmarking – measuring and analyzing a building's current energy consumption – helps building owners see where energy is being wasted, prioritize their future projects and make informed decisions about how to lower their costs.

The goal of the Hawaii Energy benchmarking pilot was to benchmark 500 commercial buildings during PY14 and the Program was able to complete benchmarking for 428 properties. 108 of these properties were analyzed using the ENERGY STAR® Portfolio Manager® and 320 properties were benchmarked using energy use intensity (EUI).

Key Findings

Initially, Hawaii Energy set out to benchmark 500 facilities via ENERGY STAR Portfolio Manager. Hawaii Energy hired a subcontractor to identify qualified candidates for free-of-charge benchmarking services, perform site visits, interview key facility personnel, and input data into the Portfolio Manager database. Despite marketing efforts by the subcontractor and Hawaii Energy, the subcontractor reported difficulty in generating participation and obtaining accurate and complete data required for benchmarking purposes. In response, Hawaii Energy conducted EUI comparisons by sector. This alternative method was used as a way to show various property types the value of benchmarking, prompt them to participate, and ask them to provide the necessary information for their property so that they could be benchmarked more thoroughly. Market sector comparisons included hotels, retail stores, supermarkets and restaurants statewide.

An example of this sector comparison is shown in **Figure 15.** Hawaii Energy has divided the population of office buildings into four groups: top 25%, low, average, and high EUI. Buildings in the top 25% group may be used as examples of how to operate a building efficiently, while buildings in the high group are the first place to look for potential energy-savings projects. Interestingly, it was observed that buildings with recent ENERGY STAR certification labels range from lowest to highest EUI. For this reason, Hawaii Energy has reached out to colleagues at the U.S. Environmental Protection Agency to determine how Hawaii-specific energy consumption data can be used to improve the Portfolio Manager® tool.

Figure 15

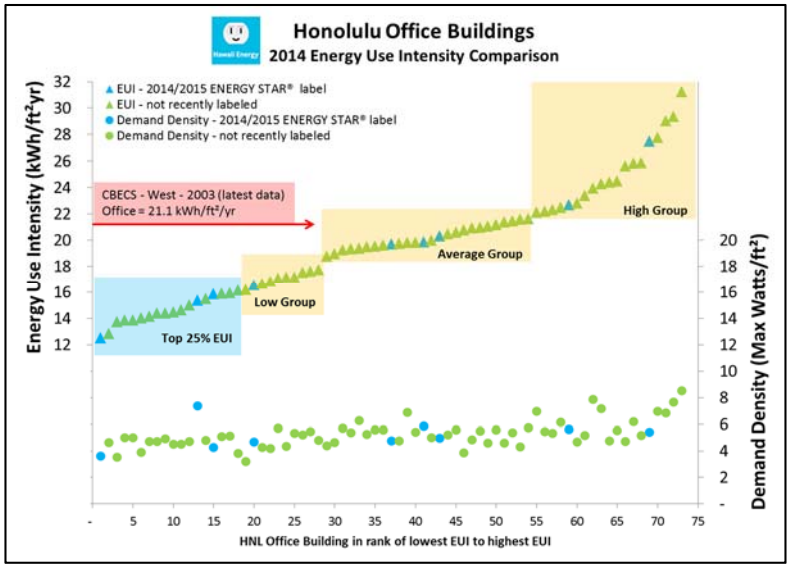
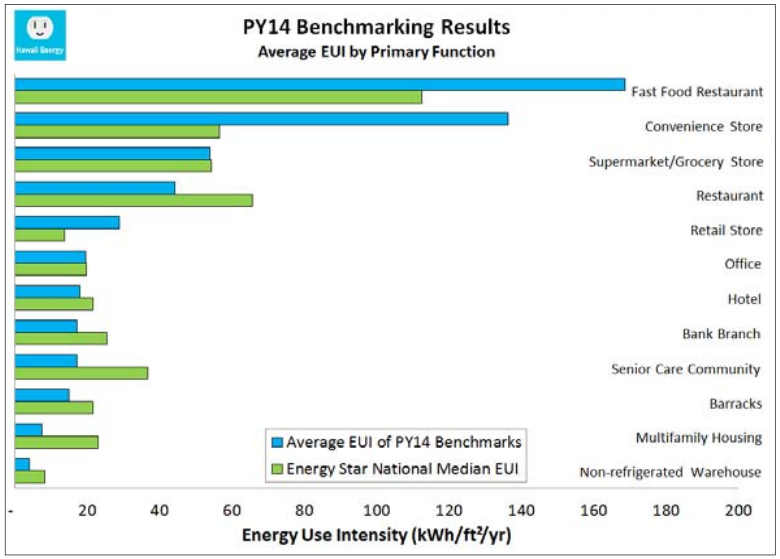


Figure 16



The average EUI results of the PY14 benchmarks can be found in **Figure 16** where they are compared to the ENERGY STAR national median values. Although these properties can be categorized together, it does not always serve as an apples-to-apples comparison. A successful benchmark is tailored to the structure and operational characteristics of each specific organization, not just a broad category, which could explain why there are differences between the Hawaii Energy and ENERGY STAR values.

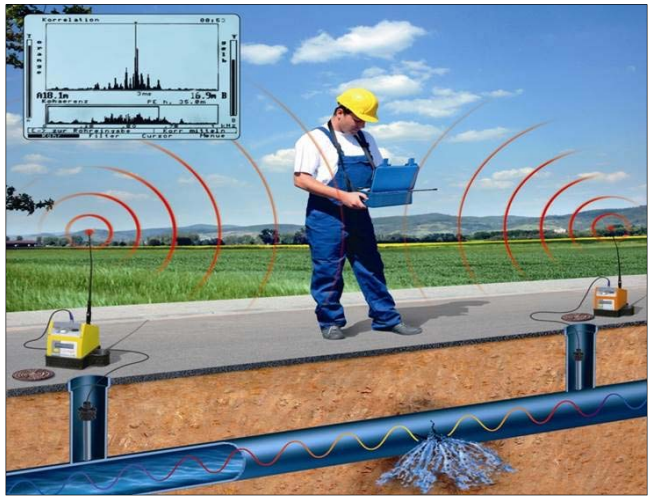
Benchmarking is not just an opportunity for buildings owners to seek out energy efficiency opportunities, but it also provides recognition for top energy efficiency performers. In PY14, nine buildings earned an ENERGY STAR label while participating in our benchmarking program for being identified as one of the top energy performers according to ENERGY STAR® PortfolioManager®. These buildings include offices, hotels, and multifamily housing.

In Program Year 2015, along with continuing to add more buildings to the Hawaii Energy portfolio, the next step for the benchmarking initiative is to target the properties with high EUIs. It is important for the Program to follow up with the benchmarked properties to help identify specific energy efficiency opportunities.

Water and Wastewater Initiative

Under the PUC's guidance, Hawaii Energy began a water and wastewater initiative in PY12 and remains committed to educating utility customers on the water-energy nexus. The primary goal of this initiative is to engage professionals in the sector and to inform them about the Program's financial offerings and other assistance. In this respect, great progress was made in Program Year 2014. In previous years, the Program searched out interested parties at both municipal and private water systems. In the most recent year, water and wastewater facility personnel began to seek out information directly from Hawaii Energy. This change can be attributed to the connections that have been made over the years with various people at local water conferences and through free trainings offered by Hawaii Energy. In particular, strong relationships have been forged with the County of Hawaii Department of Water Supply, Rural Community Assistance Corporation (RCAC), Hawaii Rural Water Association (HRWA), and the Department of Health Safe Drinking Water Branch. For more information on water and wastewater trainings and outreach, see *Technical Training* section.

In Program Year 2014, Hawaii Energy created the "Water/Wastewater Catalyst Fund". This fund was intended to invigorate stalled energy conservation/efficiency projects in the sector that had been shelved or stalled due to lack of funding or other resources. With this fund, we could incentivize a worthy project beyond our typical incentive levels, up to 100% funding. Two different projects were funded, coincidentally both at the County of Hawaii Department of Water Supply (DWS). This first project was 100% funding of a comprehensive energy study for the county water system. This study identified several energy conservation measures as well as other cost saving measures for the county. The second project was a cost-share project to accelerate the replacement of failed leak detectors and antennas that allow the county to remotely monitor the integrity of their distribution system. This monitoring system had proven itself successful in the past, but was failing due to mechanical issues and the manufacturer's warranty issues.



Through the Water/Wastewater Catalyst Fund, Hawaii Energy helped to provide new leak detectors with antennas (like the ones pictured above) to the Hawaii County Department of Water Supply, who used them to detect a 235 gallon/minute leak on the Kohala Coast. (Photo courtesy of Vivax-Metrotech.)

As water system operators are keenly aware, water loss equates to energy loss, which equates to revenue loss. Since the deployment of over 400 new devices, Hawaii DWS was almost immediately able to identify an actual water leak on the Kohala Coast, estimated at 235 gallons per minute. In this particular area on the Big Island, we calculate the water-energy relationship to be approximately 5 kWh per thousand gallons. Had this leak gone undetected for one month, for example, it would equate to over 50,000 kWh in wasted energy. Instead, the leak was repaired within one day of detection. This "equipment will amaze you as to its ability to locate and pinpoint a leak once the loggers have detected a problem within our distribution system" according to Earl Fukunaga, Supervising Water Service Investigator at the Hawaii DWS. Hawaii Energy looks forward to continuing its support of Hawaii DWS. Other projects were identified as potential

candidates for the Water/Wastewater Catalyst Fund, but were delayed for reasons beyond the control of Hawaii Energy. These projects are on the Program's radar for Program Year 2015.

As mentioned above, strong relationships have been formed with HRWA and RCAC. In PY 2014, Hawaii Energy gave away five sets of pump efficiency assessment kits (each valued at over $10,000) to the two groups and provided hands-on training sessions at pump stations in Holualoa on the Big Island and in Kawela on Molokai. The idea behind giving these kits away to these local groups was that the kits could then be loaned out to small water companies that may not have the resources to purchase their own testing equipment. Between HRWA and RCAC, test kits are available on Oahu, Maui, Molokai, Hilo, and Kona. According to our colleagues at HRWA, they currently have a waiting list of people that are interested in borrowing the kits.

MARKETING & OUTREACH

In PY14, the primary objective of the Program's Marketing & Communications (Marcom) efforts was to continue to increase awareness of and participation in Hawaii Energy offerings (i.e., residential rebates, business incentives and Transformational educational/training opportunities). The Program leveraged successes and lessons learned to enhance proven strategies and explored additional innovative and cost-effective opportunities to reach customers across the three counties with continuous refinement to maximize results. Below are highlights.

Market Research

In PY14 (October and December 2014), the Program subcontracted with QMark, a local market research company, to gauge awareness, obstacles and opportunities surrounding the Program's Demand Response, Smart Grid, Electric Vehicles and Time-of-Use (TOU) rate pilot projects. (See Transformational program section for details on the pilots). In addition to these topics, Hawaii Energy was able to include a number of program awareness and participation questions.

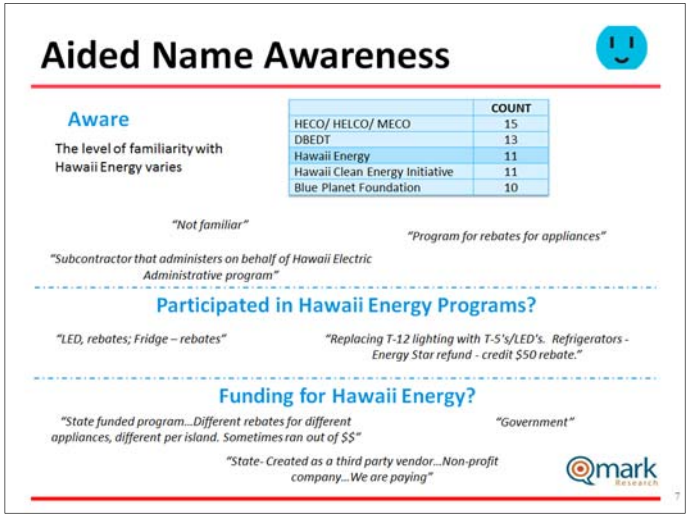
In summary, results indicated that although there is relatively low awareness of Hawaii Energy (56% on average across the three counties) as compared with the utilities notably 93% on average), of those who had heard of the Program, many had heard of specific program offerings (ranging from 78 to 35%) and some had participated (ranging from 34 to 15%). However, only 10% reported having had contact with the Program. As such, the research indicated a strong need to increase program branding/name awareness. Since the release of the findings, the Program continues to consider and propose strategies to address and incorporate the information and suggestions from the market research, and plans to do so throughout PY15.

The market research was comprised of two qualitative components and one quantitative component. Below are the key findings from each component as it pertained to program awareness and participation:

(1) Qualitative:

a. Focus groups (the results helped to shape the quantitative component): Five total groups with two on Oahu, one on Maui, one in Kona and one in Hilo

- Awareness was very low with one or two participants mentioning the "smiley face" logo. Once asked, a few participants were aware of a solar water heater rebate and ENERGY STAR appliance rebates but did not associate these with Hawaii Energy.
- Due to the low aided name awareness of Hawaii Energy, research participants agree that the organization needs to introduce itself to the public and explain its primary mission and goals. They feel the organization should stress that they are a local organization that understands the community they are tasked to serve. This is particularly important on the Neighbor Islands.



- Suggestions from participants to further promote Hawaii Energy included: advertising more, sharing the background of the program, clearly defining programs available, explaining how participants can save money, separating the program from the utilities and highlighting concepts of conservation or being "green".

b. One-on-one interviews: 15 interviews with respondents from property management, restaurant, service, retail and manufacturing sectors to focus on Business Program areas of improvement and opportunities.

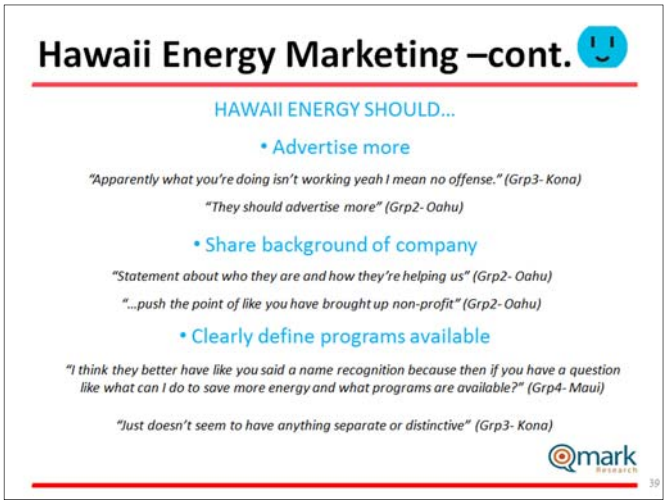
- Saving energy was considered important by 14 out of 15 participants and ranked at a mean of 8.0 on a scale from 1 to 10.
- 11 out of 15 were aware of incentive programs with nine reporting that they had participated in them. Two specifically named Hawaii Energy unaided.
- When Hawaii Energy was named by the interviewer, 11 out of 15 reported being familiar with the program.
- When asked what messaging points Hawaii Energy should focus on in its marketing and communications campaigns, suggestions included: being more aggressive (e.g., "more education", "make contact"), showing them the savings and emphasis on the environmental aspect (e.g., "saving our Hawaii", "right for the 'aina").

(2) Quantitative (a mix of telephone and online surveys): 632 residents were surveyed from late November through early December 2014. Of the respondents, 422 were from Oahu, 103 from Hawaii Island and 107 from Maui County.

- 56% said they had heard of Hawaii Energy. Notably, awareness of Hawaii Energy is higher among younger segments of the sample. For example, among adults under the age of 35, 67% had heard of Hawaii Energy. As a point of comparison, name awareness fell to 45% among residents over the age of 65.
- 10% reported having contact with Hawaii Energy at least once in the past.
- Of those who had heard of Hawaii Energy:
    - Approximately 87% felt very or somewhat favorable toward Hawaii Energy. Of the remainder, about 12% had an unfavorable view of the program. In contrast, 43% of the respondents reported an unfavorable opinion of the utilities.
    - Unaided Awareness:
        - 43% could describe – unaided – Hawaii Energy or a Hawaii Energy offering. The remaining 57% could not describe the program or an offering, or simply said they did not know. This infers that the respondents who reported having heard of Hawaii Energy is somewhat inflated based on the generic nature of the Program's name which many find familiar to varying degrees.
        - 9% said that Hawaii Energy is the organization behind the ENERGY STAR appliance rebates.
        - 8% claimed that Hawaii Energy's mission is to promote the conservation and reduction of energy use, while 5% felt Hawaii Energy is a champion of alternative energy resources.
    - Aided Awareness & Participation:
        - Of five specific offerings named (see below), respondents recognized them to varying degrees ranging from 78 to 35%, with participation ranging from 15 to 34%:

1. *Solar Water Heating*: 78% awareness, 23% participation
    - There was a higher awareness among homeowners in single family units (81%) as compared to renters and those living in multi-unit (70%) dwellings.
2. *ENERGY STAR appliances*: 71% awareness, 34% participation
    - Those who are currently paying the highest electric bills ($250+/month) are least likely to have heard of this rebate. For example, just 62% in this upper tier were aware of this offer compared to 75% among those whose bills average less than $250 per month.
    - Those with a college degree (77%) were more likely to have been aware of the Appliance rebate than are those without a degree (62%).
3. *Efficient light bulb low prices*: 50% awareness, 29% participation
4. *Old refrigerator rebates:* 42% awareness, 15% participation
    - Those with the lowest electric bills are more likely to have heard of the rebate to get rid of old refrigerators. For example, 52% of those whose monthly electric bills average less than $100 were aware of this program compared to 34% among those paying more than $250 each month.
5. *Home Energy Reports:* 35% awareness, 20% participation
    - Those on the Neighbor Islands (45%) were more likely to have prior awareness of the Home Energy Reports than are those on Oahu (31%).

- In addition, the 456 online survey respondents were presented with a list of different sources of information and asked to select the ones they would typically use to learn more about topics like those discussed (e.g., energy conservation and efficiency, as well as pilot topics). Top responses included the Honolulu Star-Advertiser, Hawaii News Now, KHON 2, word-of-mouth, KITV-4, websites/online, direct mail and radio (in that order, although respondents could check all that applied).



Marketing & Communications

The following highlights efforts and results from: (1) email marketing; (2) online engagement; (3) collateral development; (4) advertising; (5) direct mail; (6) outreach; and (7) sponsorships and collaborations.

Email Marketing

Email marketing has proven over the last year to be one of the most effective communication channels for the Program. PY14 efforts focused on growing and frequently engaging with our subscriber base, increasing promotion of Transformational and Clean Energy Ally program offerings and generating easy-to-digest, relatable content for all messaging.

The Program continues to provide three primary subscription options (Residential, Business and Energy Professionals) and is now also able to reach participating Clean Energy Allies through their own subscriber list. With the exception of the Clean Energy Allies, users may opt-in to as many of the subscription options as they choose; so many subscribers receive information for all three audience segments.

Some highlights of our email marketing efforts this year include:

- Growing the total subscriber list to over 12,560 subscribers, with more being added daily through our residential rebate applications, outreach event sign-ups and website opt-in portal. Residential is the largest list with more than 10,800 subscribers, followed by Business (830), Energy Professionals (780) and Clean Energy Allies (150).
- Continuing our monthly Residential and bi-monthly Business e-newsletter series, which achieved average open rates of 34.12% and 33.53%, respectively. Both are above average rates by industry standards and indicate that our audience is engaged and interested in the content they receive.
- Utilizing Hawaii Energy-generated emails as cross-promotion for Transformational offerings, including the EEFG Sales Training series and Certified Energy Manager and Building Operator Certification courses. These "reminder" messages sent to our Business and Energy Professionals lists not only helped to increase enrollment, but ensured that qualified potential participants were being reached.
- Building a robust launch and communication tool for the Clean Energy Ally program. Our specially-designed template allows the Program to easily send emails to all Allies at once and allows them to stay abreast of Program changes and the resources/benefits available to them.

Frequent e-newsletters like those pictured here help the Program keep in contact with customers and receive fast results on which content is of interest to subscribers.

Online Engagement

Social Media

Hawaii Energy continues to utilize social media (via Facebook, Twitter and on occasion, Instagram) as a communication channel and as a means of staying up-to-date with the energy industry, as well as local/national news and community events. Overall, the Program aims to produce a wide variety of content (text, photos, links, etc.), post at least 3-5 times a month on Facebook and Twitter and keep a constant pulse on user engagement. As of the end of PY14, the Program had over 3,500 Facebook "likes" and over 2,700 Twitter followers, counts that remained consistent over PY14. Additionally, the Instagram account, which was started in PY13, is up to approximately 136 followers.

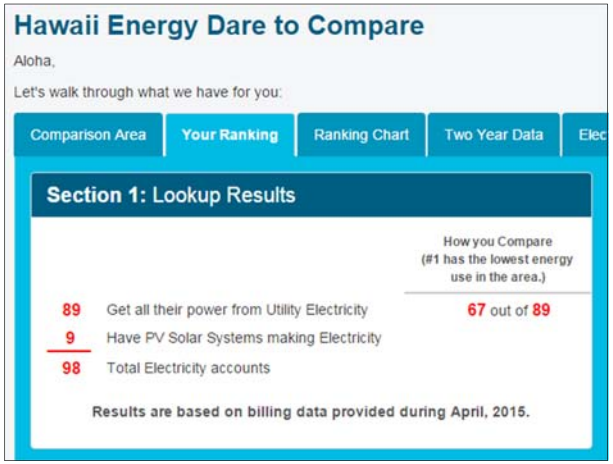
Website

The Program's website continues to serve as a key resource to learn about how to save energy and money on electric bills. Website development and management was brought in-house in January 2015 with improvements to the homepage for easier navigation as well as plans to develop new customer engagement tools. This will ensure that our site is providing a relevant and positive user experience.

One example is the "Dare to Compare" tool, which is designed to engage residential and business customers with live, personalized information regarding their energy usage and monthly electricity bill as compared to their "neighbors" (i.e. within a 1/10 mile radius or a minimum of five properties in that area).

Prior to launching the redesigned website in January 2015, the website was receiving an average of 4,800+ unique visitors and 20,000 page views per month during PY14. Users spent between 2.5 - 3 minutes on the site and viewed an average of 2.77 pages each time. Since the redesign, the website receives approximately 5,200+ unique visitors and 23,451 page views per month, visits are now between 1 - 2 minutes and each user views an average of 1.34 pages. The reduction in visit time and page view counts may be due to improved navigational access to popular pages.

The Program will continue to refine the website and monitor and analyze the metrics to increase the website's value and usability to customers.



The new Hawaii Energy-developed "Dare to Compare" website tool provides a personalized energy usage comparison for all Hawaii residents

Collateral

Understanding the value of fresh, informative and engaging collateral pieces, the Program took the opportunity in PY14 to revitalize content and design for several existing brochures and handouts. Feedback from customers and team members helped fuel the update process as well as the creation of a number of new pieces that are now distributed during meetings, Hawaii Energy presentations and outreach events.

Updates to existing pieces included:

- *SBDIL brochure* – a complete redesign (added testimonials, a step-by-step walkthrough of the retrofit process and photo examples of qualifying lighting equipment)
- *Residential tri-fold* – updated rebate amounts and energy-saving tips; added a home energy usage graphic
- *Business summary sheets* – separated into Lighting & Non-Lighting sheets

New collateral pieces developed in PY14 include:

- A *Business Program overview brochure* listing the various incentives available (without technical specifications) for commercial customers and an introduction to the Clean Energy Ally program
- *Restaurant kitchen incentive-specific pieces*: overview brochure and restaurant-specific technical summary sheet
- A *postcard* promoting the launch of the free Residential energy-saving kit
- A *brochure* summarizing the Program's PY13 Annual Report

The Program also continued to build its case study library, which was developed to showcase some of our most successful projects in various market sectors and as a resource for Business program team members, contractors and customers. The following three case studies were developed in PY14:

- *Four Seasons Maui* – Large-scale project including lighting, HVAC, pool pumps, restaurant kitchen hood demand ventilation and a Building Automation System
- *Hawaii Prince Hotel Waikiki* – Water-Cooled Chillers
- *Honolulu Museum of Art* – LED Lighting (pictured at right)

Advertising

Seeking to maximize the available advertising budget, increase brand awareness and drive customers to participate in specific offers, the Program strategically planned and executed a number of advertising campaigns during the program year, ranging in duration from one month to multiple months. See below for highlights.

Co-op Advertising

To promote the Program's $1,000 residential solar water heating rebate, a co-op advertising program was once again offered to participating contractors as a means to help offset their advertising costs while increasing the Program's reach. To participate, contractors were required to include the Hawaii Energy logo and approved messaging. PY14 marks the first full year of offering this program, and after taking into consideration the feedback and lessons learned from our "pilot" program in PY13, the Program refined its requirements and increased the reimbursement cap to $3,000 per contractor. These changes, along with a longer window for participation, made it easier for contractors to take advantage of the offer. A total of nine companies representing all three

counties participated and the Program reimbursed over $18,000 in advertising costs. Many of the contractors expressed that they would not have been able to purchase ads had it not been for this offer.

Digital Advertising with Summit Media

In conjunction with the launch of the residential energy-saving kit online sale (see Residential section), Hawaii Energy purchased a digital advertising package with Summit Media that included a combination of web banner and Facebook ads for a 30-day period during the months of April and May.

The web banner ads were strategically distributed using several methods:

1) Outreach: Ads displayed on the first visit to several pre-determined collections of websites ("display networks") designed to reach particular demographics. We used three display networks, listed below with just some of the sites that fall under each:
    - *Women* – YouTube.com (Beauty & Fitness, Home & Garden, Cooking & Recipes); Zimbio.com; MyFitnessPal.com; Cosmopolitan.com
    - *Go Green* – Weather.com; Instructables.com; Edmunds.com; NationalGeographic.com
    - *Home Improvement* – bhg.com; Youtube.com (Home Improvement, Yard & Patio); GardeningKnowHow.com; DreamHomeSource.com
2) Keyword Targeting: Ads shown to users who type in specific search keywords
3) Retargeting: Ads shown to users after they visit and leave the Hawaii Energy website (i.e. energy-conscious customers). This method had a frequency cap of 24x per user.

Each method and its corresponding spend allocation was determined by Summit Media, within the constraints of our overall budget for this campaign. Summit Media tracked how many users clicked the ads and the number of "conversions" (completed sales transactions on the Hawaii Energy online kit order page).

The Facebook ads were run using the Facebook-provided Website Conversions format, in which the objective is to direct users to our website and take a specific action (e.g. sign up to receive a kit) using a conversion pixel to track actions (completed sales). This method of advertising proved to be an exceedingly cost-effective option for the Program – it was the smallest amount of money spent within the package (25% of the budget) but contributed to a majority (326 out of 339) of the sales conversions. In addition, the Facebook ads increased the daily reach of the Hawaii Energy page by as much as 900% compared to the average reach of the previous month.

A total of 3,466 unique kit orders were made during the sale period, with 9.8% coming from the digital ads.

Hawaii Energy ran three sizes of banner ads through its digital advertising buy with Summit Media, promoting the online redemption Home Energy Kits. Working with Summit Media allowed the Program to customize distribution methods and see real-time tracking on each method.

Radio Advertising Campaign with Summit Media

To increase reach and build on the momentum of the launch of a short radio advertising campaign in PY13 (April – June 2014), Hawaii Energy worked with Summit Media to develop and execute a strategic and cost-effective advertising campaign from October 2014 through June 2015.

For PY14, the campaign included the following:

1) KRTR 96.3 FM - "90's, 2K and Today"
    a. Traffic Billboards: Ten-second spots during the afternoon traffic report (3 – 7 p.m. weekdays) with a tagline mentioning that the report is brought to listeners by "Hawaii Energy – your energy conservation and efficiency program"
    b. Branding Spots: 15-second spots highlighting Hawaii Energy offers, including residential rebates such as Window AC, Rid-A-Fridge to Fight Hunger and Trade-Up, as well as spots to generally promote incentives for businesses.
    c. On-Air Energy Saving Tips: 15-second spots with energy-saving tips
    d. Endorsement Spots: 60-second spots "endorsed" by Shawnee Hammer, a key KRTR morning show deejay, with examples of energy-saving actions she's taken/considered with the help of the Program, encouraging listeners to check out Hawaii Energy's website to do the same at home.
    e. On-Air Interviews: 30-second monthly pre-recorded interviews with deejay Shawnee Hammer featuring Hawaii Energy Residential Program Director, Caroline Carl, promoting program offers/tips for the month.

2) Hawaiian 105 KINE FM - "The Hawaiian Music Station"
    a. Branding spots (same as above for KRTR)
    b. On-Air Energy Saving Tips (same as above for KRTR)
    c. On-Air Interviews (same as above for KRTR)

Both KRTR and KINE are ranked the most popular Oahu radio stations among adults 25 and over, and consistently in the top 3 in the Honolulu market. In general, KRTR reaches approximately 98,700 listeners each week, with KINE reaching about 94,000 listeners each week.

Hawaii Business Advertorial and Advertising Campaign

To build on the momentum started in PY13, the Program continued an advertorial and advertising campaign in PY14 with Hawaii Business magazine from October 2014 through May 2015. Hawaii Business reaches 81,000 business-minded readers and decision-makers each month. The campaign featured "Energy Tip of the Month" columns, a monthly advertisement designed to attract attention similar to an editorial in the front "Trending Now" section of the monthly publication. To increase readers' attention, the column was refreshed to feature Lisa Harmon, Clean Energy Ally Specialist, as the "author" and the Program refined the writing style and tone to be a fine balance between catchy and factual yet actionable for the business reader. In PY14, the column promoted a range of offerings including incentives for lighting retrofits and restaurant/kitchen equipment, as well as benefits for participants in the new Clean Energy Ally program.

In addition, the Program continued with a 1/3 page monthly ad placed in the "Small Business" section from October 2014 through April 2015 that highlighted a business customer that received an incentive. In PY14, featured businesses included Hilton Hawaiian Village Waikiki Beach Resort, Honolulu Museum of Art and Four Seasons Hualalai. Moreover, added value to the media buy included reduced cost for promotional benefits including Hawaii Energy-focused e-blasts reaching approximately 16,000 Hawaii Business online subscribers per blast (featuring topics such as a Small Business Direct Install Lighting program testimonial from Eggs 'N Things and new restaurant/kitchen equipment incentives); a full-page inside back cover ad in the September 2014 "Construction" issue; and Gold sponsorship benefits for Small Business Administration Hawaii District Office and Hawaii Business' Small Business Awards Luncheon in May 2015.

Additional Strategic Advertising Campaigns

To keep the Program top-of-mind with customers and increase reach across the three counties, Hawaii Energy focused on a number of additional strategic advertising buys to promote key messages outlined below. Overall, the advertising strategy used a mix of radio, print and online advertising. The portfolio of media purchased for this campaign yielded an estimated reach of 4.76 million.

"Meet the Team" ads promoting the Business program

- Objective: To increase awareness of incentives and technical resources for businesses.
- Creative: New creative was developed using in-house resources. The ads featured Hawaii Energy's team of business specialists available for a wide range of sectors and industries at the ready to help customers.

Media buy included:

- General business newspapers
  - Pacific Business News – Inserts in the Friday hard copy edition
- Trade publications with decision-maker/influencer audiences
  - Building Industry magazine
  - Hawaii Buildings, Facilities & Property Management Expo Guide
  - Building Management Hawaii magazine
- General population newspapers
  - West Hawaii Today - Hawaii Island newspaper
  - Hawaii Tribune Herald - Hawaii Island newspaper
  - Maui News - Maui newspaper
  - Honolulu Star-Advertiser
- Neighbor Island radio
  - NewWest Broadcast Corp. (KWXX Hilo, KAOY Kona, KNWB Hilo, KMWB Kona, KPUA Hilo) - Hawaii Island stations
  - Pacific Media Group (KJKS 99.9 FM, KPOA 93.5 FM, KMVI 900 AM, KNUI 550 AM) - Maui stations
- Online
  - MauiNow.com – Website banner ad (part of Pacific Media Group buy)

Residential Solar Water Heating & Participating Contractor "Mahalo" ads

- Objectives:
  - Solar Water Heating ads: Build on the brand equity and awareness from the PY12 and PY13 advertising campaigns, which ran the PY12 creative; increase awareness of the benefits of solar water heating; and drive customers to Hawaii Energy's website to learn how to get started.
  - "Mahalo" ads: Thank Solar Water Heating Participating Contractors listed in the ad and promote solar water heating.
- Creative: The Solar Water Heating advertising leveraged creative originally developed as part of a bigger ad campaign in PY12. The "Mahalo" ads were developed using in-house resources.

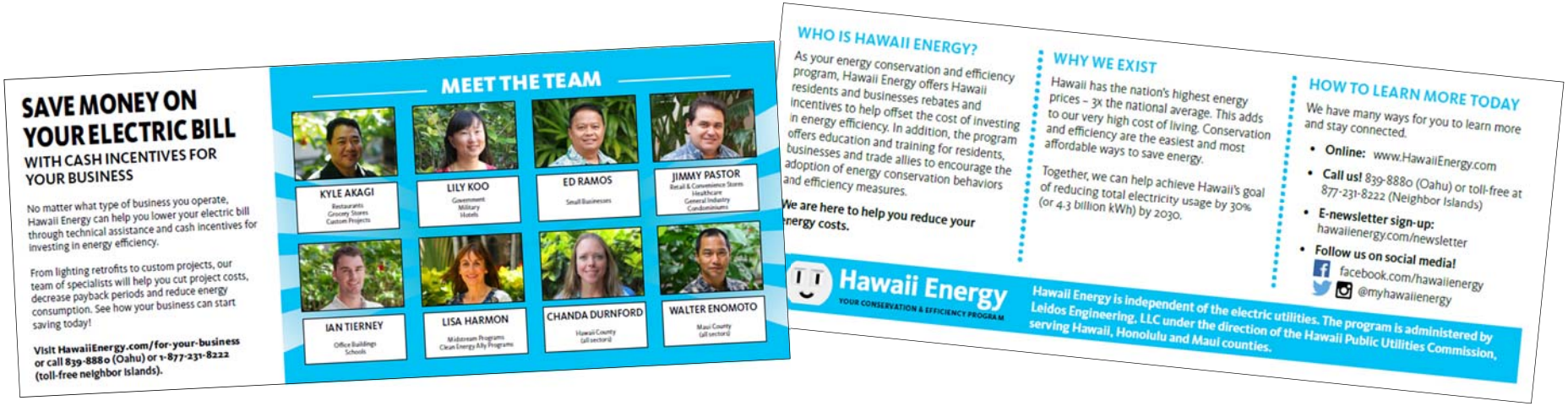
Media buy included:

- Newspapers
  - West Hawaii Today - Hawaii Island newspaper
  - Hawaii Tribune Herald - Hawaii Island newspaper
  - Maui News - Maui newspaper
  - Midweek – Oahu weekly newspaper
- Neighbor Island radio
  - NewWest Broadcast Corp. (KWXX Hilo, KAOY Kona, KNWB Hilo, KMWB Kona, KPUA Hilo) - Hawaii Island stations
  - Pacific Media Group (KJKS 99.9 FM, KPOA 93.5 FM, KMVI 900 AM, KNUI 550 AM) - Maui stations
- Online:
  - StarAdvertiser.com – Homepage ad

Direct Mail

Electric Bill Inserts

The Hawaiian Electric family of companies once again offered the opportunity for the Program to produce inserts included with customer bills. The Program produced four Residential and three Business inserts that were included with the October, February, March and June electric bills in Hawaii, Honolulu and Maui counties, reaching approximately 360,000 residential and 60,000 commercial customers per month.



This electric bill insert (front and back, above) featuring Business Program specialists and their various service sectors was designed by Hawaii Energy and distributed to approximately 60,000 commercial account holders in PY14.

Solar Water Heating Direct Mail

In an effort to increase participation for the residential solar water heating rebate, we expanded upon last year's direct mail campaign. Design and data production were brought in-house, and the cost savings of developing the piece ourselves allowed us to distribute the mailer to more households.

The piece was mailed to approximately 50,000 customers across the counties who were identified as: (1) having a home size larger than 700 sq. ft., (2) having an average monthly energy use of greater than 700 kWh over the last year, (3) not having a photovoltaic system and (4) never having participated in the solar water heater rebate program before.

As a result, the program received a significant lift in traffic to our solar water heating website page in the four days after the distribution of the direct mailer. We received on average 107 visits per day, up from an average of 30. A vanity URL (hawaiienergy.com/solarsavings) was used on the direct mail piece, which enabled us to track interest and engagement. This was the first time the Program used a direct mail strategy to reach a program data-driven target-segmented audience to promote an offer.

Outreach

The Program continues to participate in a variety of community events throughout the year as it generates brand awareness and allows for valuable face-to-face time with customers. Hawaii Energy participated in 45 events in PY14 – the most the Program has ever done in a single year. Our overall goals for community outreach have always been to: (1) collaborate with local businesses and nonprofit organizations to further our messaging efforts; (2) increase our participation in local events and expos to broaden our audience reach and (3) continue to present the Program to a variety of organizations and groups.

Event Participation and Presentations

Hawaii Energy built upon a strong foundation of successful outreach events and explored several opportunities to reach customers in specific market sectors and hard-to-reach areas. Community outreach participation is defined as the Program having a booth or table at an expo, conference, tradeshow, fair or festival and providing information and giveaways. Committing to events is done strategically, in alignment with the long-term goals of (1) reaching a wide array of electric ratepayers; (2) continuing to have a presence at past events that were deemed successful/valuable and (3) exploring new opportunities to reach targeted or historically underserved market segments. The 45 community outreach events we completed this year had an estimated total attendance of 106,875 people. Of these events, 73% of them were in the City & County of Honolulu, 11% in Hawaii County and 16% in Maui County.

Several new events were added in PY14, including: the Maui Food Technology Center Supply & Service Expo, a "Ride & Drive" event for National EV Week and a "Business After Hours" networking event hosted by the Chamber of Commerce of Hawaii (see next section).

Table 73
Number of Outreach Events and Presentations

Counties			Grand Total
Hawaii	Honolulu	Maui	
5	33	7	45

Table 74
Estimated Reach of Outreach Events & Presentations

Counties			Grand Total
Hawaii	Honolulu	Maui	
1,325	29,500	76,050	106,875

Sponsorships & Collaborations

Chamber of Commerce of Hawaii

The Chamber of Commerce of Hawaii ("the Chamber") serves as an advocacy and resource forum for 1,000+ member organizations representing more than 200,000 employees across the State. Hawaii Energy sponsored the Chamber, specifically for the resource objective of the organization[4], during the second half of the program year in alignment with our goal of increasing brand awareness and our reach to targeted market sectors. The sponsorship included advertisements on the Chamber website and in their weekly e-newsletters as well as title sponsorship of four events:

1. *"Reframing Energy Efficiency as a High-Yield, Low-Risk Investment"* – A 1.5 hour invitation-only breakfast event on February 25, 2015 targeting C-suite Chamber members and featuring Mark Jewell, founder of the Energy Efficiency Funding Group (EFFG). Approximately 58 individuals attended the event, which covered topics ranging from how to recognize and dispel myths that can delay or prevent investments in efficiency; demanding more from vendors and service providers, including pursuing all sources to fund efficiency initiatives; and taking a life-cycle cost approach to consider higher first-cost, premium-efficiency options. See the Transformational section for more information.

2. *"How to Get Your Chickens to Lay More Eggs: Hidden Energy Savings & Incentives for Manufacturers"* – A lunch-hour panel discussion on April 1, 2015 that targeted those in the manufacturing industry. The panel consisted of two manufacturing business executives who had received incentives from Hawaii Energy, Hawaii Energy's Director of Business Operations and Business Program Manager, and an executive from INNOVATE Hawaii, which provides resources for expanding and start-up businesses in Hawaii. Topics included how the two manufacturers grew their businesses and used energy-saving programs to improve their businesses and save money. Approximately 31 individuals attended the event.

3. *"Step Into Spring": Business After Hours networking event* – Hawaii Energy sponsored a quarterly Chamber networking event that was open to the public and Chamber members. This event on April 22, 2015 drew approximately 83 attendees. Hawaii Energy utilized this event to reach out to our growing base of Clean Energy Allies and provided complimentary admissions to the first 25 Allies to register. Hawaii Energy was also included in all event marketing and staffed an informational table at the event.

4. *Restaurant Industry Trainings* – Hawaii Energy hosted a two-day series with facilitators from Fisher-Nickel, Inc. on energy efficiency best practices for restaurant and foodservice facilities. The Chamber helped coordinate logistics and publicize the workshops to their foodservice industry members. Approximately 31 individuals attended the trainings. See the Transformational section for more information.

Top: Email announcement for the lunch-hour panel presentation tailored for manufacturing industry members. Bottom: Attendees at the "Step Into Spring" networking event.

[4] The Program did not participate in any advocacy objectives as it remains vigilant and cognizant that it is a ratepayer-funded program under the direction of the Public Utilities Commission.

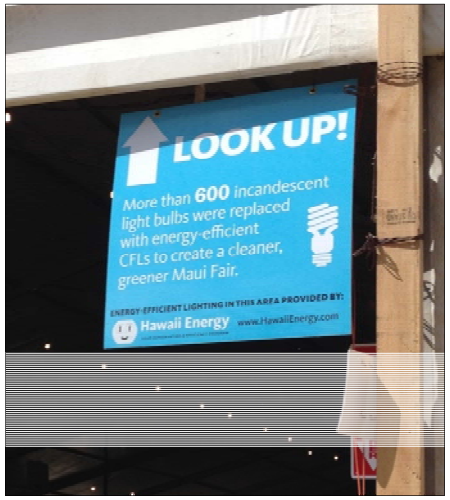
Honolulu Board of Water Supply

Hawaii Energy collaborated once again with the Honolulu Board of Water Supply to sponsor their 37th Annual Water Conservation Week Poster and Poetry Contests. This year's theme, "Water Matters – Conserve It," invited Oahu students to demonstrate their knowledge of the value of water conservation and how to preserve Oahu's precious drinking water supply for generations to come.

More than 1,400 posters and 275 poems were submitted to the annual contests and the winners were selected for each age group based on the accuracy of information, originality, creativity and artistic or poetic ability. 42 Oahu students from kindergarten to 12th grade were recognized and presented with awards at a ceremony held at the City and County of Honolulu's Mission Memorial Auditorium. Hawaii Energy was included in all marketing efforts, attended the Water Conservation Week mayoral proclamation and will be prominently featured on the end-of-year calendar highlighting all of the contest winners and submissions.

Maui Fair Lighting Retrofit

As a longtime participant in the Maui Fair, one of Maui's oldest and largest community events, Hawaii Energy was asked by Fair organizers for assistance in making the four-day annual event more energy-efficient. Maui County Business Program Specialist Walter Enomoto identified lighting as the quickest, most cost-effective way for the Fair to start seeing energy savings. Hawaii Energy provided more than 600 CFLs to replace old, incandescent bulbs in high-traffic areas of the fairgrounds, including the food court, Entertainment and Products & Services tents and entrance ticket booths. In exchange for providing the lamps, Hawaii Energy received the marketing value of an in-kind sponsor, which included three large vinyl banners placed around the fairgrounds, ad space and an editorial feature in the Maui News' annual Maui Fair tabloid piece and additional signage around the fairgrounds alerting attendees of the lighting retrofit.



The Products & Services tent was one of many areas at the 2014 Maui Fair retrofitted with new, energy-efficient CFLs. Signage was placed around the fairgrounds encouraging attendees to "Look Up!" and spot the new bulbs. The retrofit is estimated to save the Fair approximately 3,932 kWh and $1,475 annually.

"Rid-A-Fridge to Fight Hunger" Benefitting Food Banks

This was the Program's second year running the "Rid-A-Fridge to Fight Hunger" campaign, where residents who participated in the refrigerator recycling rebate offer could choose to donate their rebate amount to a local food bank. After a successful collaboration with Hawaii Foodbank (Oahu), Maui Food Bank (Maui) and The Food Basket (Hawaii Island) in PY13, the Program re-launched the campaign at the start of PY14 with a news release promoting its continuation to eventually yield fruitful results. Across the three counties, more than $7,000 was donated and went toward providing meals for Hawaii's hungry. The Program will work on securing media coverage on the results and encourage more residents to participate in the rebate offer in PY15.

Public Relations

Public relations is the management of relationships between an organization and its various stakeholders through strategic communications. Hawaii Energy's public relations and outreach efforts have resulted in developing solid, working relationships with the local news media, which has allowed the Program to be featured in various newsworthy stories. Positive media coverage about Hawaii Energy was read, watched and listened to throughout PY14.

Hawaii Energy continued to strategically identify and leverage opportunities to amplify electric utility ratepayer's awareness of and participation in the program's offerings. Public relations continues to be a critical component to the Program's comprehensive marketing strategy to establish credibility and build awareness through earned media coverage.

Results

Hawaii Energy generated a plethora of media coverage that spanned all news mediums including television, radio, newspapers, magazines, websites and trade publications. The estimated total reach of all earned media coverage for PY14 was more than 10.4 million.

The Advertising Value Equivalency (AVE) is what the editorial coverage would cost if it were advertising space (print publications) or on-air time (television and radio). The Estimated Publicity Value is calculated by multiplying the AVE figures by three, since editorial coverage is a third-party opinion and therefore considered three times that of a paid advertisement. The Estimated Publicity Value totaled more than $197,000.

Media Coverage Highlights

Earned media coverage is highlighted below and divided into categories. To read full stories secured throughout the year, please refer to the media coverage report in Attachment F.

Left to Right: Matt Lynch (Sustainability Coordinator, University of Hawaii System), Larry Newman (Director of Business Operations, Hawaii Energy) and Michael Pfeffer (CEO, Ibis Networks).

Press Conference

On May 8, 2015, Hawaii Energy, the University of Hawaii (UH) and Ibis Networks (Ibis) hosted a joint press conference at the Windward Community College in Kaneohe. Hawaii Energy was one of the key presenters talking about a pilot project funded through the program's Energy Efficiency Auction. The auction funded 77% of the total $142,612 project costs.

The press conference was developed in collaboration with UH, Ibis and the Energy Excelerator to showcase the project that was designed to reduce plug-load energy consumption at three campuses: UH Manoa, Windward Community College and UH Hilo. Ibis installed 1,232 of its patented plug-load technologies (InteliSockets) into existing electrical outlets that collected energy usage data for more than 1,500 devices that included computers, monitors, printers, power strips, copiers, mini fridges and televisions.

Hawaii Energy's Larry Newman (Director of Business Operations) was one of the featured guest panelists at the conference alongside Michael Pfeffer (CEO, Ibis Networks) and Matt Lynch (Sustainability Coordinator, University of Hawaii System). Larry explained the goal of the Energy Efficiency Auction, why Ibis' project was selected and pointed out that the growth in plug-load energy consumption meant opportunities for energy efficiency.

The Energy Excelerator moderated the discussion and Representative Chris Lee, Chair of the Committee on Energy and Environmental Protection, provided the opening remarks and briefly discussed the State's clean energy goals. DBEDT's Director Luis Salaveria provided the closing remarks. A Windward Community College student presented her classwork that involved studying energy usage and management with the InteliSockets.

The press conference was covered by two television stations KHON (Hawaii's FOX affiliate) and KITV (ABC affiliate) on the 6 p.m. evening newscast and late night 10 p.m. newscast as well as the *Pacific Business News.*

Check Presentations

Hawaii Energy recognized and promoted several businesses' energy-saving projects and the financial incentives received from the Program. There were a total of seven check presentation events with companies in various industries, including hotels, federal government, non-profits and education. The company's executive teams and contractors that worked on the projects were invited for a photo opportunity on property. In turn, Hawaii Energy secured photo placements and stories in several media outlets. Below is a sampling of the businesses that were featured and the resulting media coverage.

Hilton Hawaiian Village Waikiki Beach Resort

Hawaii Energy presented a $471,192 incentive check to the Hilton after the completion of phase I of a multi-phase, multi-million dollar energy efficiency upgrade project. Phase I included a major lighting retrofit in 1,839 guest rooms and the installation of energy-saving fan coil motors in all 2,860 guest rooms. The project costs were $1.91 million. Hawaii Energy's incentive covered 24% of these costs. The energy efficiency upgrades are estimated to save 2.8 million kWh annually – equivalent to $710,360 in energy costs based on $0.2837/kWh.

- *Green Lodging News* – "Hawaii Energy Awards Its Largest Hotel Incentive Ever"
- Hawaii News Now's "Sunrise" – Morning TV news show
- *Pacific Business News* – "Hawaii Energy Awards $471K to Hilton Hawaiian Village For Energy-Efficiency Programs"

Honolulu Museum of Art

The Honolulu Museum of Art on Beretania Street and the Honolulu Museum of Art Spalding House (formerly the Contemporary Museum) in Makiki replaced 1,236 linear fluorescent tube lights and 2,754 halogen, incandescent and compact fluorescent lamps with energy-efficient LEDs.

Hawaii Energy presented a $91,007 incentive check to the Honolulu Museum of Art for enhancing its lighting quality while saving substantial amounts of energy for both locations. The museum will save an estimated 468,599 kWh annually, which is the equivalent to $113,400 in energy cost based on $0.242/kWh.

- *Midweek* – "Donation Reduces Energy Costs"
- *Pacific Business News* – "Honolulu Museum of Art trades in fluorescent lighting for LEDs"

Kamehameha Schools

Hawaii Energy presented a $128,662 check to Kamehameha Schools (KS) for various energy efficiency renovations to its Oahu and Hawaii Island campuses as well as for a Kakaako commercial property. KS upgraded air conditioning systems and interior and exterior lights on its Kapalama campus on Oahu. The school replaced 106 fluorescent and incandescent lamps with dimmable LEDs in the Performing Arts Center. LEDs were also installed in 153 street lights that illuminate the 600-acre campus. Induction lights were installed in the school's new 500-stall parking garage.

Left to Right: Hawaii Energy Director of Business Operations Larry Newman; KS Sustainability Manager Amy Brinker; KS CFO/VP of Finance and Facilities Ben Salazar; KS Director of Facilities Development and Support Therese Rosier and Hawaii Energy Jr. Business Program Specialist Ian Tierney.

The newly-constructed KS Middle School, also on the Kapalama campus, installed an energy-efficient air conditioning system. On Hawaii Island, the 300-acre campus in Keaau significantly lowered its energy usage by tinting the south- and west-facing windows and adding 248 motion sensors to interior lights.

KS Kapalama is estimated to save 664,423 kWh annually, equivalent to $172,750 in energy costs based on $0.26/kWh. KS Hawaii is estimated to save 19,679 kWh annually, equivalent to $6,887 in energy costs based on $0.35/kWh (electric utility rates are slightly higher on Hawaii Island).

- *Honolulu Star-Advertiser* – "Kamehameha Schools Saves on Energy"
- *Green Hawaii Magazine* – "Kamehameha Schools Rewarded for Energy Efficiency"
- *Midweek* – "Kamehameha Schools Goes Green"

Hawaii Energy Offers

Throughout PY14, the Program parlayed each new or updated residential and business offer into a news opportunity. The process involved working closely with operational staff to identify details of the offer, as well as its energy savings potential and cost benefits. In addition, to better prepare Hawaii Energy's call centers, the team developed documents addressing the frequently asked questions about these various offers.

The Program's public relations efforts resulted in stories in various newspapers, trade publications, online news websites, blogs and radio interviews. Below is a sampling and brief description of the different offers and key media coverage.

Hawaii Energy Conservation Award

Hawaii Energy awarded Four Seasons Resort Maui at Wailea's 20-person engineering team with the "Hawaii Energy Conservation Award" for their impressive commitment to reducing energy costs at their facility. The award recognized the team's outstanding leadership, contribution and commitment toward energy conservation and sustainability for the State of Hawaii.

Four Seasons Resort Maui's team was led by its energy-saving visionary and Director of Engineering, Pat Ware. Pat was responsible for overseeing more than $8 million in energy-efficient renovation projects for the 635,976 square-foot property from 2010 through 2014. The resort is expected to save an estimated 3.8 million kWh per year. The electricity savings are estimated to total more than $1 million annually (based on $0.26/kWh) once the remaining projects are completed by 2016.

- MauiNow.com – "Four Seasons Resort Maui's Engineering Team Earns Energy Conservation Award"
- Maui TV News – "Saving Energy At Four Seasons Saves $1,000,000 A Year"
- *Pacific Business News* – "Four Seasons Resort Maui Receives Hawaii Energy Conservation Award"

Pat Ware, former Director of Engineering at the Four Seasons Resort Maui at Wailea, facilitated an extensive amount of energy-efficient upgrades at the resort during his tenure. He and his team were honored with the Hawaii Energy Conservation Award this program year a few weeks before his retirement.

Lighting Distributor Instant Rebates

Hawaii Energy launched a new Lighting Distributor Instant Rebate program to provide businesses, and the contractors who serve them, instant lighting rebates (as much as 75% of costs) at the time of purchase. The program was designed to help contractors and electric utility business customers reduce the working capital required to implement energy-efficient lighting projects. Lighting rebates are applied to the invoice at the time of purchase so customers do not need to complete any rebate forms.

- *Energy Manager Today* – "Businesses Offered 'Instant Rebates' from Utility"
- MauiNow.com – "Hawai'i Energy Offers Lighting Distributor Rebate Program"
- *Pacific Business News* – "Hawaii Energy Offers Instant Rebates for Energy-Efficient Lighting"

Energy Efficiency Auction

Hawaii Energy launched the "Hawaii Energy Efficiency Auction" to find out how innovative and cost-effective the market could be when it came to helping residents and businesses save energy. The Auction was an open call for contractors, developers, energy efficiency solution providers, energy service companies, energy vendors and property managers to submit qualified energy efficiency projects to compete for up to $2.1 million in incentive funds to offset project costs.

Hawaii Energy selected applicants for incentive funds of up to $1.96 million. The four applicants selected (one residential and three commercial) included Honeywell Smart Grid Solutions (Honeywell) (one residential and one commercial project), Matrix Energy Services (Matrix) and Ibis Networks, Inc.

Since the auction was open to companies both in Hawaii and the mainland, the Program distributed a press release through a national newswire service.

Local Coverage

- *Green Magazine* – "Hawaii Energy Selects Energy Auction Participants"
- Hawaii Public Radio's "The Conversation" – radio show
- *Hawaii Herald-Tribune* – "Energy Efficiency Auction Seeks Projects to Fund"
- *Honolulu Star-Advertiser*– "Hawaii Energy to Stage Energy Efficiency Auction"
- *Pacific Business News* – "$2M Energy Efficiency Program Selects Companies to Do The Work"
- *West Hawaii Today* – "Small Businesses, 3 Colleges to Benefit from Energy Efficiency Projects"

Sampling of National Coverage
(NOTE: Same headline as the press release, "Hawaii Energy Offers State's First-Ever Energy Efficiency Auction")

- Boston.com
- *Dallas Morning News*
- *Energy Manager Today*
- Reuters
- *The Sacramento Bee*
- *Sustainable Business News*
- Yahoo! Finance

Efficiency Auction Project Manager John Rei announces the auction on Hawaii Public Radio's "The Conversation" morning radio show.

Home Energy-Saving Kits

Hawaii Energy launched a new offer unlike any in the program's six-year history: free and low-cost home energy-saving kits that gave residential electric customers the opportunity to reduce their annual energy costs by up to $160.

The free kit (valued at $25) included the following: one ENERGY STAR® CFL, one ENERGY STAR LED, one high-efficiency showerhead and one faucet aerator. The advanced kit (valued at $39) was $10 to purchase and included two LEDs and one seven-plug advanced power strip.

- Hawaii News Now's "Sunrise" – Morning TV news show
- *Honolulu Star-Advertiser* – "Electrical Customers Eligible for Energy Kit"
- Maui Time – "How to Get Your Free Hawaii Home Energy Kit"
- MauiNow.com – "Hawai'i Energy Kits Can Save Up to $160 in Annual Energy Costs"
- *West Hawaii Today* – "Free Energy Saving Kits Offered to Big Island Residents"

Window AC Trade-Up

Hawaii Energy launched its "Window AC Trade-Up" offer to help residents purchase a qualified ENERGY STAR® window air conditioner. A $50 rebate was provided for those making the purchase when they surrender an old working unit. Residents could expect to save about 235 kWh or $80 annually based on an average of $0.34/kWh compared to a non-ENERGY STAR model. The Program also provided free pick-up and haul away to ensure the old working ACs were properly recycled. The press release issued secured the following key coverage:

- Green Leaf Blog (Hon. Star-Advertiser) – "Window A/C Rebates"
- *Honolulu Star-Advertiser* (Print & Online) – "Hawaii Energy Offering $50 Rebate"
- KHON's "Wake Up 2Day" (Hawaii Fox Affiliate) – Morning TV news show
- MauiNow.com – "Hawaii Energy Launches Window Air Conditioner $50 Rebate"

Residential and Transformational Program Director Caroline Carl demonstrates what to look for when purchasing a new window air conditioner on KHON2's "Wake Up 2Day" morning show.

Program Positioning

Hawaii Energy proactively pursued stories about the program as a whole to showcase its various offerings, upcoming plans for PY14 and offered practical energy-saving tips for residents. The team secured two stories in Hawaii's largest daily newspaper, the *Honolulu Star-Advertiser*, which included a half-page story in the Sunday edition that has the highest readership of any day in the week.

The half-page story appeared in a weekly column called "Akamai Money" that features Hawaii's business leaders addressing various topics in a question-and-answer format. Caroline Carl, Residential and Transformational program Director, answered various questions about how readers could practice energy conservation and efficiency.

Some of the no- to low-cost tips included replacing incandescent lights with CFLs or LEDs, reducing phantom loads and using an advanced power strip. To save more energy, Caroline talked about the benefits of using less hot water and installing a solar water heating system. She reinforced its annual energy

savings and Hawaii Energy's $1,000 instant rebate. Caroline also talked about refrigerators as the appliance that had the largest impact on a homeowner's electric bill and that a 20-year model may cost as much as $384 annually to operate. She discussed Hawaii Energy's "Refrigerator Trade-Up" program that provided a $100 rebate as well as the "Rid-A-Fridge" program to get rid of a second working refrigerator or freezer.

In November 2014, the Honolulu Star-Advertiser also ran a story previewing the Program's Transformational pilot projects. Joe Simpkins, Director of Technical Services, explained that the PUC asked the Program to expand its initiatives to develop and test different energy-efficiency strategies that would enhance the integration of renewable energy on the electric grid.

The story mentioned that Hawaii Energy planned to work with the electric utility to support energy storage and would provide technical support for the Hawaii Building Code Council's codes and standards as well as integrate demand response capabilities. Also discussed was that the program was working with the utilities on demand response devices to test smart thermostats to be used with air conditioner replacements, smart water heater controls and a demand response component to Hawaii Energy's existing solar water heating incentives. Joe pointed out that managed demand response, EVs, energy storage and other smart-grid capabilities were keys to accelerating the use of clean renewable energy to Hawaii's grid and reducing energy costs.

The *Honolulu Star-Advertiser* story was picked up nationally by *Bloomberg News* and featured on its website that receives an estimated 20.8 million unique visits per month.

Weekly Online Talk Show

Hawaii Energy continued its sponsorship of the "Hawaii: The State of Clean Energy" online talk show produced and hosted by Jay Fidell of ThinkTech Hawaii. Hawaii Energy modified the cadence of its "Negawatt Moment with Hawaii Energy" segments to a bi-weekly format (previously weekly). Each segment ran about 5 to 10 minutes. The show was streamed live on Ustream.com on Wednesdays from 4 to 5 p.m. and re-aired on community access television station *Olelo*.

The talk show served as a forum for Hawaii Energy's staff to bring awareness to the latest residential, business and transformational rebates and incentives as well as practical energy conservation tips. It was also an opportunity to meet and stay connected with Hawaii's thought-leaders in the energy industry. The Program conducted media training and developed talking points to prepare staff members for each interview.

Residential Junior Program Specialist Rachel Fukumoto presents the "Negawatt Moment" for the "Hawaii: The State of Clean Energy" online talk show produced by ThinkTech Hawaii.

KEY REPORTING ASSUMPTIONS

Technical Resource Manual (TRM)

All energy efficiency and conservation programs need to estimate the average amount of energy and demand that is saved for installations of standard measures. This allows an effective program to promote these standard measures across markets with an incentive amount that is appropriate for the amount of energy and/or demand that is typically saved. Hawaii Energy maintains these energy saving estimates in the Technical Resource Manual (TRM). The following describes how the TRM was developed and the key assumptions that were used in estimating the energy (kWh) savings and demand (kW) reduction impacts claimed by the Program. Changes are made from time to time at the recommendations of the Program Evaluator. Upon the end of each program year, a formal evaluation is conducted by the Program Evaluator whereby updates are implemented for the subsequent program year.

The TRM is intended to be a flexible and living document. New measures may be added as new program designs are implemented. These measures are often not yet characterized, so new information will be gathered through evaluations or research. Savings for current measures may change as the market evolves.

There are four main reasons to update TRM values:

- *New Measure Additions* – As new technologies become cost-effective, they will be characterized and added to the manual. In addition, new program delivery design may result in the need for new measure characterization.

- *Existing Measure Updates* – Updates will be required for a number of reasons; examples include: increase in the federal standard for efficiency of a measure; new information from field tests; altered qualification criteria; decrease in measure cost; or a new evaluation that provides a better value of an assumption for a variable. As programs mature, characterizations need to be updated to meet the changes in the market.

- *Retiring Existing Measures* – When the economics of a measure become such that it is no longer cost-effective or the free-rider rate is so high that it is not worth supporting, the measure shall be retired.

- *Third-Party Measurement and Verification (M&V) Contractor TRM Review* – Annually the M&V contractor will provide a review of the current TRM and make recommendations based on current market research and in-field savings verification of measures.

Description of the TRM

The TRM provides methods, formulas and default assumptions for estimating energy and peak demand impacts for measures and projects that receive financial incentives from Hawaii Energy. It is organized by program, end use and measure. It describes how the Program estimates energy savings from each measure. The PY13 TRM represents a total of 73 measures for both residential and commercial programs and is shown as Attachment E.

Overview of the TRM Derivation

In the TRM, each measure includes a description of the typical baseline (average) energy use and the high-efficiency energy use for that type of technology. The energy saved is typically the differential between the two. The energy use of the baseline technology may include some estimation of market status related to various types of older, less efficient equipment. The final savings values are compared against the previous evaluation studies performed for the Hawaiian Electric Companies' programs, as described in this report.

Data assumptions are based on Hawaii specific data, when and where available. Where Hawaii data was not available, data from neighboring regions is used where available and in some cases, engineering judgment is applied. Referenced data sources, in general order of preference, but not necessarily limited to, include:

- Energy and Peak Demand Impact Evaluation Report of the 2005-2007 Demand Management Programs – KEMA
- HECO IRP-4: Energy Efficiency Potential Study (HECO DSM Docket)
- 2004 – 2005 Database for Energy Efficiency Resources (CA DEER database)
- 2007 – 2008 Database for Energy Efficiency Resources (CA DEER database) Update
- Other Energy Efficiency Program Design Information (e.g. Efficiency Maine, Focus on Energy, etc.)
- CEUS – The California Commercial Building End-Use Survey
- Evergreen TRM Review/Report dated 6/20/13
- Evergreen – Third Party Evaluation NTG Recommendation Memo January 2013
- ENERGY STAR® Partner Resources
- Field verification of measure performance

The savings estimates for each measure were initially drawn from the KEMA Evaluation Report for 2005 through 2007 since this report was the most recent information available on specific markets. The values in this report were built upon previous evaluation reports and in-field measurements.

Since there were many measures that used "average" field measured data and no mathematical savings derivations, the calculation approach in the TRM attempted to develop these savings calculations based on typical measure characteristics. The primary use of the KEMA report values was to guide market assumptions, especially for the baseline energy use, to more accurately estimate the typical savings.

Customer level savings are based on many variables including: measure life, market sectors, base versus enhanced case, persistence and coincidence factors. Claimed savings were compared against other sources, such as savings values used in other jurisdictions and research documentation from KEMA, the American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE), the National Renewable Energy Laboratory (NREL) and other organizations.

Factors Determining Program Level Savings

Application of System Loss Factors

The amount of energy saved at a customer site is not equal to the amount saved at the electric utility plant supplying the energy to that site. There are system losses in generation, transmission and distribution of energy from the power plant to the site. This results in a larger savings at the power plant than at the customer site. To account for this larger impact on the system the "system loss factor" needs to be estimated. The system loss factors were provided by HECO, MECO and HELCO. They do not vary by measure, but by island, and are listed in **Table 75**.

Table 75
System Loss Factors

County System to Customer Energy Loss Factors		
Oahu	Maui	Hawaii
11.17%	9.96%	9.00%

The system loss factors were applied to the estimated Customer Level savings for each measure to calculate the impact on the system of a particular measure. The resulting System Level savings was used to estimate the overall impact to the reduced cost of not producing the saved energy. This "avoided cost" is the overall economic benefit and used within one of the primary cost benefit measures for the Program, called a Total Resource Cost (TRC) test.

Net-to-Gross Ratio

The Net-to-Gross (NTG) Ratio is used to adjust the System Level Energy savings to determine the energy saving that is attributed to the Program, or "Program Level Savings."

Program Level Savings are those directly attributed to Hawaii Energy actions by separating out the impacts that are a result of other influences, such as consumer self-motivation or free-riders. Free-riders are ratepayers or participants who received an incentive and/or education by the Program, but the incentive and/or education did not play a role in their decision to purchase or receive the savings measure.

Table 76
Net-To-Gross Factors

Program	Description	NTG
BEEM	Business Energy Efficiency Measures	0.75
CBEEM	Custom Business Energy Efficiency Measures	0.75
BESM	Business Services and Maintenance	0.95
BHTR	Business Hard-to-Reach	0.99
REEM	Residential Energy Efficiency Measures	0.79
CESH	Custom Energy Solutions for the Home	0.65
RESM	Residential Services and Maintenance	0.92
RHTR	Residential Hard-to-Reach	1.00
Composite NTG Ratio		**0.78**

New Program Net-to-Gross Values

The Third-Party Evaluator recommendations for Net-to-Gross values were adopted for the development of the PY13 Annual Plan and were based on verified PY12 results. These values recognize the differences in Program-driven savings between the various categories of measures. The evaluation can be found at www.hawaiienergy.com/information-reports. Hawaii Energy utilizes the combined Program total NTG ratio of 78%. The values used in PY14 are provided in **Table 76**.

Development of Avoided Costs

As described above, the primary overall economic benefit for the State is the avoided cost for the energy that is saved. The total avoided cost of all the energy that is saved is called the Total Resource Benefit (TRB). To estimate the TRB for individual measures or for the total savings for the Program, the cost per MWh supplied and the system capacity cost per kW need to be estimated into the future.

Proxy Avoided Cost Developed

The avoided cost that is used for PY14 is estimated using an extrapolation of the avoided energy data provided by HECO. The energy and capacity cost data from the first few years was then extrapolated over 20 years. **Table 77** shows this extrapolation. This table was deemed a reasonable estimate of actual avoided energy and capacity costs as it was more in line with the avoided costs used in many other programs. Therefore, these avoided costs were used to calculate the TRB (Total Resource Benefit).

Table 77
Utility Avoided Cost

		Discount Rate		
		6%	Utility Avoided Cost	
Year	Measure Life	NPV Multiplier	$/kW/yr.	$/kWh/yr.
2014	1	1.00	353.2	0.104
2015	2	0.94	370.6	0.109
2016	3	0.89	382.5	0.112
2017	4	0.84	386.2	0.113
2018	5	0.79	387.7	0.114
2019	6	0.75	389.1	0.114
2020	7	0.70	391.9	0.115
2021	8	0.67	390.7	0.115
2022	9	0.63	394.6	0.116
2023	10	0.59	398.3	0.117
2024	11	0.56	397.4	0.117
2025	12	0.53	401.4	0.118
2026	13	0.50	405.7	0.119
2027	14	0.47	409.3	0.120
2028	15	0.44	415.9	0.122
2029	16	0.42	423.3	0.124
2030	17	0.39	428.9	0.126
2031	18	0.37	433.9	0.128
2032	19	0.35	438.9	0.130
2033	20	0.33	443.9	0.132

Second Avoided Cost Developed

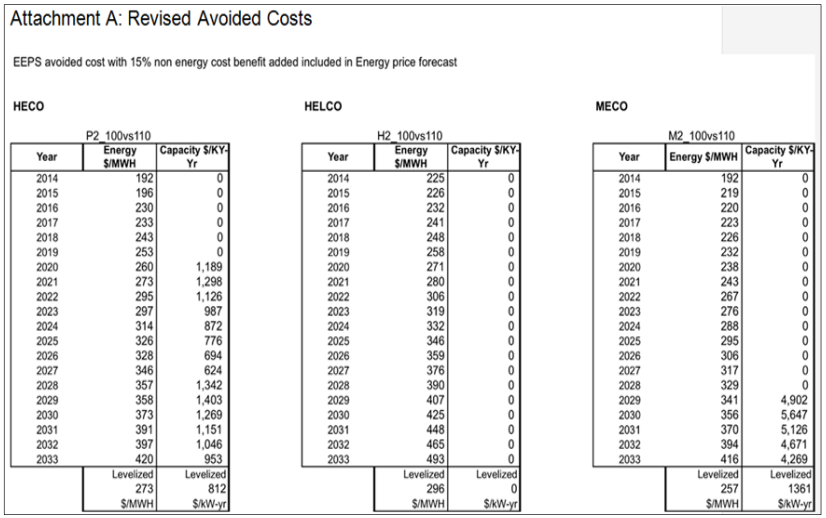
A second avoided cost was calculated based on guidelines to use an initial $0.161/kWh avoided cost figure, for 2015, and escalate it at 3% per year. **Table 77a** is an update to **Table 77**, where for PY14 we repeated the avoided cost predicted for 2015. This figure is a conservative value derived from EEPS filings in the Waiver Docket 2013-0056 shown in **Table 77b**. The capacity avoided cost for the Program takes into account a prorated demand value based on Oahu demand achievements of 76%. No capacity savings was used for Maui County as the out years do not materially impact the NPV TRB, as shown in **Table 77c**.

Table 77a
Utility Avoided Cost Using Modified Current EEPS Figures

			Discount Rate	Factored EEPS	Escalation Rate
			6%	76%	3%
				Utility Avoided Costs*	
Program Year	Year	Period	NPV Multiplier	$/kW/yr.	$/kWh/yr.
PY14	2015	1	1.00		$ 0.161
PY15	2016	2	0.94		$ 0.161
PY16	2017	3	0.89		$ 0.166
PY17	2018	4	0.84		$ 0.171
PY18	2019	5	0.79		$ 0.176
PY19	2020	6	0.75	$ 904	$ 0.181
PY20	2021	7	0.70	$ 986	$ 0.187
PY21	2022	8	0.67	$ 856	$ 0.192
PY22	2023	9	0.63	$ 750	$ 0.198
PY23	2024	10	0.59	$ 663	$ 0.204
PY24	2025	11	0.56	$ 590	$ 0.210
PY25	2026	12	0.53	$ 527	$ 0.216
PY26	2027	13	0.50	$ 474	$ 0.223
PY27	2028	14	0.47	$ 1,020	$ 0.230
PY28	2029	15	0.44	$ 1,066	$ 0.236
PY29	2030	16	0.42	$ 964	$ 0.244
PY30	2031	17	0.39	$ 875	$ 0.251
PY31	2032	18	0.37	$ 795	$ 0.258
PY32	2033	19	0.35	$ 724	$ 0.266
PY33	2034	20	0.33		$ 0.274
PY34	2035	21	0.31		$ 0.282
PY35	2036	22	0.29		$ 0.291
PY36	2037	23	0.28		$ 0.300
PY37	2038	24	0.26		$ 0.308
PY38	2039	25	0.25		$ 0.318

* EEPS (2013-0056) Avoided Capacity Cost factored by 76% to reflect contribution of kW reductions achieved on Oahu in PY13. $161/MWh Avoided Costs per Guidance Recommendations. This is a conservative estimate based on EEPS 2014 Projections of $192, $225 and $192/MWh for HECO, HELCO and MECO respectively.

Table 77b: AVOIDED COSTS ATTACHMENT A FROM WAIVER DOCKET – 2013-0056



Attachment A: Revised Avoided Costs

EEPS avoided cost with 15% non energy cost benefit added included in Energy price forecast

HECO

P2_100vs110

Year	Energy $/MWH	Capacity $/KY-Yr
2014	192	0
2015	196	0
2016	230	0
2017	233	0
2018	243	0
2019	253	0
2020	260	1,189
2021	273	1,298
2022	295	1,126
2023	297	987
2024	314	872
2025	326	776
2026	328	694
2027	346	624
2028	357	1,342
2029	358	1,403
2030	373	1,269
2031	391	1,151
2032	397	1,046
2033	420	953
	Levelized 273 $/MWH	Levelized 812 $/kW-yr

HELCO

H2_100vs110

Year	Energy $/MWH	Capacity $/KY-Yr
2014	225	0
2015	226	0
2016	232	0
2017	241	0
2018	248	0
2019	258	0
2020	271	0
2021	280	0
2022	306	0
2023	319	0
2024	332	0
2025	346	0
2026	359	0
2027	376	0
2028	390	0
2029	407	0
2030	425	0
2031	448	0
2032	465	0
2033	493	0
	Levelized 296 $/MWH	Levelized 0 $/kW-yr

MECO

M2_100vs110

Year	Energy $/MWH	Capacity $/KY-Yr
2014	192	0
2015	219	0
2016	220	0
2017	223	0
2018	226	0
2019	232	0
2020	238	0
2021	243	0
2022	267	0
2023	276	0
2024	288	0
2025	295	0
2026	306	0
2027	317	0
2028	329	0
2029	341	4,902
2030	356	5,647
2031	370	5,126
2032	394	4,671
2033	416	4,269
	Levelized 257 $/MWH	Levelized 1361 $/kW-yr

Table 77c: CALCULATION OF OAHU PRO-RATED CAPACITY AVOIDED COST

PY13 System Level Demand Impacts - kW		
Oahu	16,481	76.4%
Hawaii	2,469	11.5%
Maui	2,597	12.0%
Molokai	8	0.0%
Lanai	8	0.0%
Total	21,563	100.0%

CONCLUSION

As we conclude this PY14 Annual Report, the Hawaii Energy team would again like to thank the PUC and the people of Hawaii for the opportunity and privilege to serve as your Public Benefits Fee Administrator over the past six years. We especially appreciate the confidence you have placed in us by extending our contract for a third additional year (through 2016). This will allow us to make an even stronger contribution to Hawaii's clean energy efforts during this time of unprecedented energy transformation.

We also want to thank the PUC staff, our Contract Manager, subcontractors, allies, friends and constituents for all the support you have provided to help us develop energy efficiency as Hawaii's No. 1 most valuable grid resource. The Hawaii Energy Team is proud to have this unique opportunity to work with all of you in making such important advances in Hawaii's quest for long term sustainability.

As we begin our final program year under the original PBFA contract, the Hawaii Energy team pledges to continue our best efforts to serve the people of Hawaii and accelerate Hawaii's progress towards a 100% clean energy economy. And we will be passionately seeking to continue our service to Hawaii under the new PBFA contract solicitation expected later this year.