Memorandum
PY2014 Verification Report

To: Chris Ann Dickerson, Jim Flanagan
From: Opinion Dynamics Evaluation Team
Date: March 16, 2016 (REVISED)[1]
Re: Verification of Hawaii Energy Program Year 2014 Programs

1. Executive Summary

This memo provides the verified savings from the 2014 Hawaii Energy Conservation and Efficiency Program (Hawaii Energy),[2] which is now in its sixth year under the management of a Public Benefits Program Administrator (PBFA). A team of independent consultants led by Opinion Dynamics verified that the PBFA reached 99% of energy savings. Table 1 below shows the verified first-year net and lifecycle net energy savings by sector, compared to the PBFA's tracked savings.

Table 1. PY2014 Tracked and Verified First-year Energy Savings and Verified Lifecycle Savings (MWh) by Sector

Sector	First-year Net Savings (MWh)		Verified Savings as % of Tracked Savings	Verified Savings as % of Total Verified Savings	Verified Lifecycle Savings (MWh)	Verified Savings as % of Total Verified Lifecycle Savings
	Tracked	Verified				
Business	53,300	51,818	97.2%	44.8%	672,157	57.3%
Residential	63,116	63,813	101.1%	55.2%	501,717	42.7%
Portfolio	*116,416*	*115,631*	*99.3%*	*100%*	*1,173,874*	*100%*

The business programs garner higher lifecycle savings than the residential programs because measures installed in these programs, on average, last longer (13 years for business programs versus 8 years for residential programs).

The State of Hawaii Public Utilities Commission (Commission) sets performance goals and incentives for the PBFA. Table 2, below, shows claimed results and incentives by the PBFA and

[1] Revisions from previous memorandum of November 20, 2015 include the following: 1) Changes to Table 2 and Table 29 to reflect errors in the originally reported Peak Demand Reduction (KW) Verified Award (change from $38,284 to $42,817) and Total Performance Award (change from $656,077 to $660,610); and 2) change within Executive Summary paragraph 3 (from 2.5% higher to 3.2% higher).

[2] Hawaii Energy is a ratepayer-funded conservation and efficiency program administered by Leidos Engineering, LLC under contract with the Hawaii Public Utilities Commission as the Public Benefits Fee Administrator (PBFA) serving the islands of Hawaii, Lanai, Maui, Molokai, and Oahu. On July 1, 2009, Hawaii Energy took over management of the demand side management programs from Hawaiian Electric Company (HECO) and its subsidiaries, Maui Electric Company (MECO) and Hawaii Electric Light Company (HELCO), referred to as the HECO utilities.www.hawaiienergy.com. Program Year 2014 ran between July 1, 2014 and June 30, 2015.

verified by the Evaluation Team. The verified award claim is slightly higher than claimed (3.2% higher), a finding that has occurred for each of the past three years. (Table 29, on page 52, also includes the performance indicator minimum, target, and maximum levels.)

Table 2. PY2014 Claimed and Verified Performance Award

Performance Indicator		Minimum	Target	Maximum	Claimed			Verified		
					Results	% of Target	Award	Results	% of Target	Award
Energy, Demand, and Cost Avoidance										
First Year Energy Reduction	kWh	101,112,173	134,816,230	148,297,852	116,583,217	86.5%	$ 211,865	115,630,941	85.8%	$ 210,135
Peak Demand Reduction	kW	12,938	17,250	18,975	18,497	107%	$ 41,009	18,872	109%	$ 42,817
Utility Cost Avoidance	TRB[a]	$ 120,554,939	$ 160,739,919	$ 176,813,911	$144,819,560	90%	$ 252,268	$ 156,524,906	97%	$ 272,658
Market Transformation										
Behavior Modification	Participants	12,600	18,000	n/a	71,176	>100%	$ 15,000	>68,000	>100%	$ 15,000
Professional Development	Participants	750	1,000	n/a	1,772	>100%	$ 15,000	>1,000	>100%	$ 15,000
Technical 'Know-How'	Participants	175	250	n/a	584	>100%	$ 15,000	>650	>100%	$ 15,000
Hawaii Energy Ally Program	Allies	n/a	200	n/a	226	>100%	$ 5,000	224	>100%	$ 5,000
Benchmarking	Sites	200 Sites and 2 items each indicator (must meet all criteria for award)	500 Sites and 3 items each indicator (must meet all criteria for award)	n/a	428	Met Minimum	$ 15,000	> 200 and <500	Met Minimum	$ 15,000
Codes & Standards	Items			n/a	2			2 items		
Demand Response	Items			n/a	3			3 items		
Smart Grid	Items			n/a	2			2 items		
Electric Vehicle	Items			n/a	3			3 items		
Island Equity[b]										
Honolulu County	Percent	66.0%	73.3%	n/a	68.1%	Met Minimum	$ 70,000	68.2%	Met Minimum	$ 70,000
Hawaii County	Percent	11.8%	13.1%	n/a	17.5%	Met Minimum		17.6%	Met Minimum	
Maui County	Percent	12.2%	13.6%	n/a	14.4%	Met Minimum		14.2%	Met Minimum	
					Total Performance Award		$ 640,142			$ 660,610

Note: First year energy savings claimed by the PBFA in their annual report[3] are 0.15% higher than the tracked energy savings shown in Table 1 above, due to small changes in the program tracking database that was provided to the EM&V team and the database that PBFA used to generate their annual report. This difference is insignificant and does not affect the award as measured by EM&V.

[a] Total Resource Benefits (TRB) are the monetized avoided utility costs from the lifecycle net energy and demand savings.

[b] To obtain an award, the PBFA must distribute incentives at no less than 80% of the targeted PBFA funding from each county. Honolulu County covers the island of Oahu. Maui County includes the island of Maui and neighboring islands of Molokai and Lanai.

This memo contains high-level information in four specific sections:

- Portfolio Verification Methods and Results (page 7): An overview of evaluation methods and results by program and sector
- Business Sector Verification Method Summary and Result Detail (page 10): Additional evaluation method details and results by measure and program
- Residential Sector Verification Method Summary and Result Detail (page 16): Additional evaluation method details and results by measure and program
- Transformational Program Validation Methods and Results (page 19): Additional evaluation methods and results

Memo appendices contain even more detail on evaluation activities, reasons for discrepancies (if any) by measure, and measure level verified net Total Resource Benefit[4] values.

[3] PY2014 Annual Report. Leidos Engineering, LLC, Hawaii Energy Program Year 2014 Annual Report (Honolulu, HI: Hawaii Public Utilities Commission, September 17, 2015). Forthcoming at: https://hawaiienergy.com/about/information-reports

[4] Total Resource Benefits (TRB) are the monetized avoided utility costs from the lifecycle net energy and demand savings

2. Introduction and Background

A team of consultants led by Opinion Dynamics and including InSynergy Engineering, Interface Engineering, Ward Research and Wilkins Communications (collectively, the Evaluation Team) has been engaged by the Commission to conduct a comprehensive multi-year evaluation of the Hawaii Energy Conservation and Efficiency Program (Hawaii Energy). Leidos, an independent third party, serves as the PBFA under contract to the Commission. This memo presents the findings from validation and verification activities[5] conducted for Program Year 2014 (PY2014), which ran from July 1, 2014 through June 30, 2015.

The PY2014 Hawaii Energy portfolio consisted of eight programs aimed at attaining direct energy savings, with four targeting the business[6] sector and four targeting the residential sector (Business Programs and Residential Programs, respectively).[7] Table 3 presents a short description of each of these programs by sector[8].

[5] Validation acts to confirm that the PBFA is calculating and reporting energy savings properly using the current, approved Technical Reference Manual values, as required. Verification assures that planned program activities occurred and that measures are in place and operating, and therefore able to save energy as expected.

[6] The term "business" includes all non-residential customer categories (commercial, industrial and agricultural).

[7] Leidos Engineering, LLC, Hawaii Energy Program Year 2014 Annual Plan (Honolulu, HI: Hawaii Public Utilities Commission, June 30, 2014). https://hawaiienergy.com/images/resources/AnnualPlans_ProgramYear2014.pdf

[8] Program summaries adapted from the PY2014 Annual Report. Leidos Engineering, LLC, Hawaii Energy Program Year 2014 Annual Report (Honolulu, HI: Hawaii Public Utilities Commission, September 17, 2015). Forthcoming at: https://hawaiienergy.com/about/information-reports .

Table 3. PY2014 Hawaii Energy Program Summary – Business and Residential

Sector	Program	Program Description
Business	Business Energy Efficiency Measures (BEEM)	Provided financial incentives to business customers for the purchase and installation of eligible energy efficient measures. The program offers incentives for prescriptive lighting, air conditioning, motors, solar water heating, water pumping, condominium submetering, and many other measures.
	Custom Business Energy Efficiency Measures (CBEEM)	Provided custom financial incentives based on calculated savings to commercial, institutional, governmental, and industrial sector customers. Some examples of custom technologies include, but are not limited to, high performance lighting, and heating, ventilation and air conditioning (HVAC) controls.
	Business Hard to Reach (BHTR)	Provided equipment grants and direct install lighting measures targeted to traditionally underserved geographies and demographics such as restaurants.
	Business Energy Services and Maintenance (BESM)	Provided incentives and direct installation of measures such as solar hot water heating and water pumping to businesses, in addition to business design, audits, and commissioning to underserved sectors. This program also continued a Central Chiller Plant Benchmarking initiative and installed real-time submeters.
Residential	Residential Energy Efficiency Measures (REEM)	Provided prescriptive incentives to residential customers who purchased and installed energy efficiency measures. These measures included high-efficiency water heating, lighting, air conditioning, appliances, , measurement and control systems, and energy efficiency kits and reports.
	Residential Energy Services and Maintenance (RESM)	Provided incentives to help offset the cost of maintenance for existing solar hot water systems.
	Residential Hard to Reach (RHTR)	Provided equipment grants to secure projects within traditionally underserved demographics and geographies. The most notable included an expanded Multifamily Direct Install initiative, working with the Hawaii County Economic Opportunity Council (HCEOO) to install 70 solar water heating (SHW) systems for "in need" families and finalizing a CFL exchange carried over from PY2013.
	Custom Energy Solutions for the Home (CESH)	Intended to provide incentives with more flexibility within the prescriptive portfolio to accommodate unforeseen market opportunities. This program started activity in PY2013. Note that CESH had no savings in the PY2014 program-tracking database as its budget was reserved for an Energy Efficiency Auction project, which faced limitations in execution due to timing constraints. Therefore, this program incurred some costs in PY2014 but no energy savings.

In addition to the eight programs described above, the Hawaii Energy portfolio also included various market transformation activities (also referred to as Transformational Programs) in PY2014 focusing on such areas as behavior modification, professional development, and training that may

lead to future energy efficiency and conservation, but for which Hawaii Energy does not set direct energy-savings goals for PY2014. Table 4 summarizes these activities.

Table 4. PY2014 Hawaii Energy Program Summary – Transformational

Program	Program Description
Behavior Modification	Aimed to build on the foundation of energy literacy and strives to reach the mass market as well as hard-to-reach residents in underserved communities in Hawaii, Honolulu and Maui counties. Components include Energy Literacy in Hard-to-Reach Communities: Sharing the Aloha, Creation and Distribution of Transformative Messaging, Access and Use of Simple Energy-Saving Devices, Hard to Reach Direct Install Support, Higher Education Support and Energy Student Summit.
Professional Development	Designed to educate professionals who are either new to the working world, new to energy efficiency or both, and includes K-12 Educator Development, Creating a Career Path Starting with Higher Education, Professional Development for the Business Community.
Technical Knowledge and Training	Technical "know how" was focused on engineers, facility managers, architects, building operators, energy managers and similar trade professionals who have experience in infrastructure and energy for a substantial portion of their career, but need to enhance their technical skills. This was a key offering for Clean Energy Allies, but was available to all qualifying participants. Elements include Building Operator Certification (BOC©) Workshops (BOC - University of Hawaii - Maui College (UHMOC) & Sustainable Living Institute of Maui (SLIM)), Water and Wastewater Training and Best Practices 2.0, and Technical Training Workshops on HVAC, pumps and motors.
Energy Systems Integration Pilots / Benchmarking	Primarily focused on Energy Benchmarking Support. Efforts included ENERGY STAR® Hawaii Energy Benchmarking Program, Green Button and ENERGY STAR Partnering, Hawaii Specific Tax-Map-Key (TMK) data integration, Accessible by Registration Web Site to allow customers "Utility" Management tools, and providing full cost incentives to targeted Benchmarking Participants.
Demand Response (DR) Pilots	Aimed to incorporate DR capacity acquisition activities to provide the Hawaiian Electric Companies (HECO) greater access to controllable loads in the following manners: Direct Integration, Demand Response Technology Screening and Pilot Projects.
Smart Grid Support	Used to determine how to enhance implementation of smart grid project to include energy efficiency enhancements and options, and coordinating these efforts with HECO. Components included: Work with HECO, Energy Usage and Participation Data Review, and Expanded Electric Vehicle Role.
Codes & Standards	Aimed to increase support of codes and standards to help the State reach its Energy Efficiency Portfolio Standard (EEPS) goals faster. Components included: Hawaii Energy 30 by 2030 – 30% Above Code Programs. Assessment of Baseline Compliance, Code Compliance Assistance, and Compliance Enhancement – early adoption of International Energy Conservation Code 2012.
Electric Vehicles	Designed to identify opportunities for electric vehicle charging that minimize renewable curtailment and support grid reliability by integrating the energy efficiency, demand response and electric vehicle offerings. Components included: Net Zero Electric Car Purchase Package and an Awareness campaign.

This memo provides the results of activities that the Evaluation Team conducted to verify savings and accomplishments from activities conducted as part of the full suite of PY2014 Hawaii Energy programs. To arrive at verified savings, we:

- Validated that the information in the PY2014 program-tracking database was correct and free of errors by confirming that savings in the program-tracking database were based on the PY2014 Technical Reference Manual (TRM)[9];
- Performed onsite inspections of some custom measures representing a high proportion of program savings; and
- Verified savings for custom measures using engineering analysis and site specific data.

This memo contains high-level information in the following four specific sections:

- Portfolio Verification Methods and Results (page 7) : An overview of evaluation methods and results by program and sector
- Business Sector Verification Method Summary and Result Detail (page 10) : Additional evaluation method details and results by measure and program
- Residential Sector Verification Method Summary and Result Detail (page 16): Additional evaluation method details and results by measure and program
- Transformational Program Validation Methods and Results (page 19): Additional evaluation methods and results

The eight memo appendices contain even more detail on evaluation activities, reasons for discrepancies by measure, and measure level verified net TRB values. Additionally, the last appendix provides a glossary of terms used within the memo.

Business Sector Appendices

- Appendix A: Business Sector Verification: Detailed Methods (page 21)
- Appendix B: Business Sector Detailed Verification Savings Adjustments (page 26)
- Appendix C: Business Sector Total Resource Benefits (page 33)

Residential Sector Appendices

- Appendix D: Residential Sector Verification Detailed Methods (page 38)
- Appendix E: Residential Sector Detailed Verification Savings Adjustments (page 43)
- Appendix F: Residential Sector Total Resource Benefits (page 49)

Other Appendices

- Appendix G: Verified Performance Award Claim (page 52)
- Appendix H: Glossary of Terms (page 54)

[9] Hawaii Energy Efficiency Programs (July 1, 2014 through June 30, 2015) Technical Reference Manual PY 2014, Measure Savings Calculations. https://hawaiienergy.com/images/resources/TRMProgramYear_2014_FINAL_V15.pdf

3. Portfolio Verification Methods and Results Summary

The Evaluation Team implemented a two-step process to verify program savings. In the first step, we compared the per-unit savings, Net-To-Gross-Ratio (NTGR), and Effective Useful Life (EUL) for each measure listed in the program-tracking database[10] to the PY2014 TRM and adjusted the measure level data as necessary to arrive at validated savings. We validated the savings via Step 1 for all measures, except those delivered through the CBEEM program[11]. In Step 2, we further verified savings for select non-CBEEM measures by comparing a sample of applications against information from the program-tracking database. For CBEEM measures, we gathered on-site data that we analyzed and compared to program-tracking database savings.

As described in Figure 1, below, Step 1 in this process identified issues or errors in the program-tracking database, itself, while Step 2 ensured that the measures listed in the database were installed, operating and met the program-qualifying criteria.

Figure 1. Validation and Verification Steps

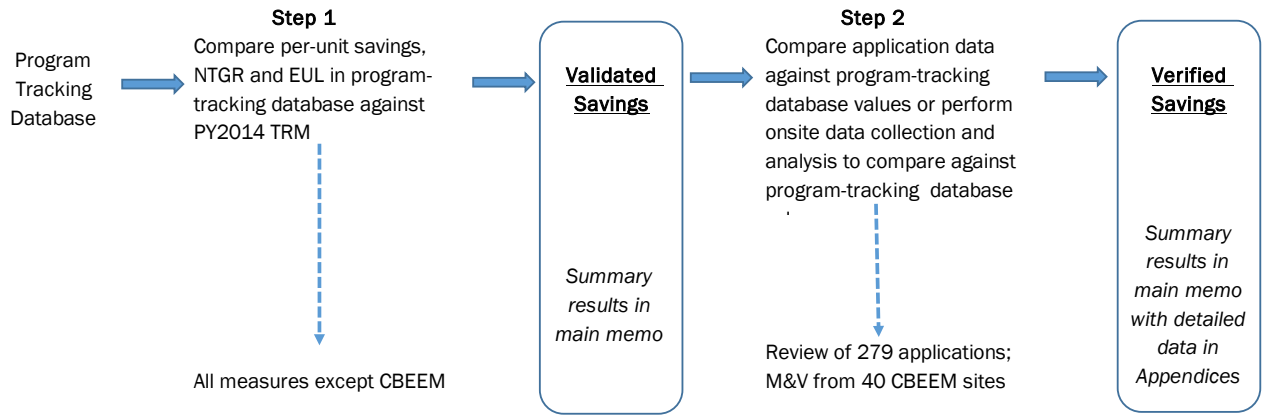

Table 5 presents validated PY2014 savings estimates by sector resulting from Step 1 activities (savings validation) and the implications of these results for program operations. While the overall validation rates are strong for each sector, the validation results for each measure within a sector varied greatly indicating that the PBFA could improve the accuracy of the program-tracking

[10] This memo presents methods and results of PY2014 program verification based on program-tracking data that the PBFA provided to Opinion Dynamics on August 17, 2015. There are slight differences between the data we used for our analysis and the data that the PBFA used to generate results for their annual report, so certain tables and line items in the annual report do not exactly match our analyses. Savings in the database we used for the verification are 0.15% less than the claimed savings in the PY2014 Annual Report.

[11] Savings estimates for the CBEEM program are site-specific and developed using methodologies approved in the TRM rather than pre-established TRM values for individual measures. As such, the Step 1 validation effort is not applicable. Verification of the CBEEM program occurred through Step 2.

database through increased quality control. Appendix B and Appendix D identify the specific database issues found for each measure.[12]

Table 5. PY2014 Validation Savings Result Summary by Sector

Sector	Validation Savings Result	Program Implications
Business	97% of total tracked kWh savings	Program-tracking database issues contribute to variation in measure-specific validation rates including: (1) database errors that lead to incorrect savings values, and (2) savings based on NTGR values not aligned with the PY2014 TRM values.
Residential	101% of tracked total kWh savings	

While we validated savings from all measures included in the program-tracking database except those delivered through the CBEEM program, we performed Step 2 verification activities on only a sample of measures based on their contribution to total PY2014 portfolio savings. Specifically, we performed Step 2 activities to verify savings for measures associated with the BEEM, CBEEM, BHTR, and REEM programs.

We based the savings verification (Step 2) sample on energy savings from the first 11 months of PY2014[13] program implementation and designed it to provide statistically valid results at the 90% confidence level, +/- 10% precision[14].

With the exception of the savings associated with measures delivered through the CBEEM program, all adjustments made to the savings reported in the program-tracking database resulted from our savings validation activities (Step 1). The savings verification process (Step 2) confirmed that that all measures were installed, operational and eligible for program incentives. As such, verified savings are identical to validated savings for the CBEEM measures.

The verification step included measurement and verification of a sample of CBEEM measures. As is typical for this type of analysis, the onsite measurement of CBEEM found projects for which savings were overestimated and projects for which savings were underestimated. However, when taken together, the analysis indicated ~100% verification rate for CBEEM.[15]

[12] We note that the PBFA changed internal tracking systems during the PY2014 program year, which could have caused some of the variation found by the evaluation team.

[13] In order to complete this verification in Q4 of 2015, we used the first 11 months of data to allow enough time to design sampling plans, perform verification, and complete analysis and reporting. Results from the samples apply to the full 12-months of program activity to determine verified results for the portfolio.

[14] This means that we are 90% certain that the true population value lies within 10% of the value estimated through the sample.

[15] The Evaluation Team has performed onsite measurement of custom programs in multiple locations across the country and seen similar results (i.e., a wide range of site-specific realization rates, but an overall realization rate close to 100%). This is comparable to measures within a TRM in that every single location in which a deemed value is applied does not result in the exact savings from the

Table 6 below shows the PY2014 verified first-year energy savings by sector and program; accounting for validation and verification adjustments. The table compares the verified savings to the PBFA's tracked savings.

Table 6. PY2014 Tracked and Verified First-year Energy Savings (kWh) by Sector and Program

Sector	Program	First-year Net Savings (KWh)		Verified Savings as % of Tracked Savings	Verified Savings as % of Total Verified Savings
		Tracked[a]	Verified		
Business	CBEEM	25,621,102	25,621,134	100.0%	22.2%
	BEEM	20,686,641	19,016,004	91.9%	16.4%
	BHTR	6,750,534	6,939,304	102.8%	6.0%
	BESM	241,549	241,549	100.0%	0.2%
	Business Total	53,299,826	51,817,991	97.2%	44.8%
Residential[b]	REEM	62,375,106	62,671,714	100.5%	54.2%
	RESM	407,156	430,614	105.8%	0.4%
	RHTR	333,391	710,623	213.2%	0.6%
	Residential Total	63,115,652	63,812,950	101.1%	55.2%
Portfolio Overall		116,415,478	115,630,941	99.3%	100%

[a] Program-level net savings from the final database provided to us for this analysis. Upon review of the PBFA's annual report, we noticed that there are slight differences between the data we used and the data the PBFA used to generate the annual report. However these differences are minor – the data we used contain 167,739 kWh fewer overall savings, a difference of 0.15%. All of the information in this memorandum are based on the final data provided to us, rather than the data used to generate Hawaii Energy's annual report.

[b] As noted in the PY2014 Annual Report, no energy savings accrued to the CESH program in PY2014 as its budget was reserved for an Energy Efficiency Auction project, which faced limitations in execution due to timing constraints. We did not include the CESH program in the tables showing verified program savings throughout this memo.

Table 7 below shows the PY2014 verified lifecycle energy savings by sector and program; accounting for validation and verification adjustments. The table compares the verified savings to the PBFA's tracked savings. The business programs garner higher lifecycle savings than the residential programs because measures installed in these programs, on average, last longer (13.2 years for business programs versus 7.9 years for residential programs).

TRM – some are higher and some are lower. However, when taken across the population, the average savings is typically very close to the TRM value.

Table 7. PY2014 Tracked and Verified Lifecycle Energy Savings (kWh) by Sector and Program

Sector	Program	Lifecycle Net Savings (MWh)		Verified Savings as % of Tracked Savings	Verified Savings as % of Total Verified Savings
		Tracked	Verified		
Business	CBEEM	295,155	293,106	99.3%	25.0%
	BEEM	301,805	282,234	93.5%	24.0%
	BHTR	89,256	95,610	107.1%	8.1%
	BESM	1,208	1,208	100.0%	0.1%
	Business Total	**687,424**	**672,157**	**97.8%**	**57.3%**
Residential	REEM	498,920	495,376	99.3%	42.2%
	RESM	2,036	2,153	105.8%	0.2%
	RHTR	1,667	4,188	251.2%	0.4%
	Residential Total	**502,623**	**501,717**	**99.8%**	**42.7%**
Portfolio Overall		1,190,047	1,173,874	98.6%	100.0%

4. Business Sector Verification Method Summary and Result Detail

In PY2014, verified business sector savings accounted for slightly less than half of all Hawaii Energy first-year portfolio energy and demand savings (at 46% and 45%, respectively), with 97% of tracked first-year net savings being verified.

4.1 Methods

As described earlier, the Evaluation Team validated three of the four business sector programs (BEEM, BHTR and BESM). As such, for each measure type in the program-tracking database, we validated that the per-unit savings (kW and kWh), NTGR, and EUL values mirrored the stipulated values documented in the TRM. This validation consisted of three areas:

- **Savings Estimates.** The Evaluation Team referred to the PY2014 TRM for the correct savings estimates for all non-custom measures. Additionally, we checked for any possible duplicates within the program-tracking database.
- **Net-To-Gross.** We applied the program specific NTG values found in the PY2014 TRM.
- **Effective Useful Life.** The PY2014 TRM includes EULs for all measures. We applied these values.

The Evaluation team conducted further verification activities for some business programs depending on how much that program contributed to the overall savings the PBFA expected from the business sector in PY2014. Further verification activities included:

- **Application and/or Invoice Review.** We reviewed a statistically valid number of applications and invoices to ensure verification of measures installed.[16]
- **Onsite Visits and Measurement.** We conducted site visits for the CBEEM program to measure specific savings parameters. For all CBEEM site visits, we verified whether the measures were in-place and operating. For six sites, we performed additional measurement and verification of expected savings.

Table 8 provides an overview of the methods, sampling and analysis conducted for business sector program verification. Please refer to Appendix A for more detailed information.

[16] The PBFA attaches applications and Invoices in the database as PDF documents, which necessitated a sampling approach for review.

Table 8. PY2014 Business Sector Verification Method, Sample and Analysis Overview by Program

Program	Percent of Expected First Year Savings	Method	Sample	Analysis
CBEEM	49.0%	Validation (Step 1)	None	Data format does not support this step.
		Onsite Measurement Verification (Step 2) only	40 sites	kWh and kW gross calculated savings in database compared to results from analysis based on data gathered during onsite audits.
BEEM	38.4%	Validation (Step 1)	All measures included	Checked database per-unit, NTGR, and EUL values against TRM values.
		Application Review Verification (Step 2)	89 measures: 44 HVAC 45 Lighting	Checked database values for sample of measures against application / invoice data.
BHTR	11.6%	Validation (Step 1)	All measures included	Checked database per-unit, NTGR, and EUL values against TRM values.
		Application Review Verification (Step 2)	45 applications	Checked database values for sample of measures against application / invoice data.
BESM	1.0%	Validation (Step 1)	All measures included	Checked database per-unit, NTGR, and EUL values against TRM values.
		Verification (Step 2)	None	Data format does not support this step.

4.2 Results

The Business sector has a high verification rate of 97%. Table 9, below, shows the overall verification results by program and measure for the business sector.

Similar to other jurisdictions in which the evaluation team is familiar, per measure category verification rates can range significantly. For Hawaii Energy, the range was primarily due to database issues including database errors leading to incorrect savings values, savings based on outdated deemed values instead of those from the PY2014 TRM and incorrect NTG values being applied to some measures. However, while the range of differences within measure categories was significant in some instances, at a portfolio level, these differences largely cancelled each other out, or were too small in relation to the overall savings to make a large impact. Specific reasons for differences between PY2014 verified and tracked savings per measure are discussed in Appendix B.

Table 9. PY2014 Business Sector Verification Results by Program and Measure

Program	Measure	Tracked First Year Net Energy Savings (kWh)	Verified Net First-year Savings (kWh)	Verified % of Claimed Net First Year Savings	Verified Savings as % of Total Sector Savings	Verified Net Lifecycle Savings (MWh)	Verified Lifecycle Savings as % of Total Sector Savings
Business Energy Efficiency Measures	Aerator	3,709	23,629	637.1%	0.05%	141.78	0.02%
	CEE Tier 1+ Motors	3,482	3,482	100.0%	0.01%	52.23	0.01%
	Ceiling Fans	28,878	11,240	38.9%	0.02%	56.20	0.01%
	CFL	188,479	195,098	103.5%	0.38%	1,124.06	0.17%
	Chillers	2,864,045	2,610,289	91.1%	5.04%	52,205.77	7.77%
	Clothes Washer	48,682	77,513	159.2%	0.15%	852.64	0.13%
	Cool Roof Technologies	24,536	24,536	100.0%	0.05%	245.36	0.04%
	Delamping	85,082	85,074	100.0%	0.16%	1,191.04	0.18%
	Delamping with Reflectors	560,552	560,498	100.0%	1.08%	7,846.98	1.17%
	Domestic Water Booster Packages	247,424	417,970	168.9%	0.81%	6,269.55	0.93%
	Electrically Commutated Motors (ECM)	580,126	574,234	99.0%	1.11%	8,613.51	1.28%
	ENERGY STAR LED Dimmable w/Controls	7,396	7,810	105.6%	0.02%	117.15	0.02%
	Freezer - Bounty	2,135	2,135	100.0%	0.00%	29.89	0.00%
	Heat Pump	392,149	392,149	100.0%	0.76%	3,921.49	0.58%
	Ice Machine (add size range)	921	921	100.0%	0.00%	11.05	0.00%
	Kitchen Ventilation	254,466	254,466	100.0%	0.49%	3,816.99	0.57%
	LED Exit Signs	280,519	280,492	100.0%	0.54%	4,487.87	0.67%
	LED Lighting	3,882,675	3,880,297	99.9%	7.49%	58,204.46	8.66%
	LED Refrigerated Case Lighting	191,122	170,678	89.3%	0.33%	2,560.16	0.38%
	Metal Halide	79,647	79,640	100.0%	0.15%	1,114.96	0.17%
	Package Units - 15% Better Than Code	986,351	937,967	95.1%	1.81%	14,069.51	2.09%
	Reach-In Refrigerator Solid Door	1,423	1,078	75.8%	0.00%	12.93	0.00%

Table 9. PY2014 Business Sector Verification Results by Program and Measure

Program	Measure	Tracked First Year Net Energy Savings (kWh)	Verified Net First-year Savings (kWh)	Verified % of Claimed Net First Year Savings	Verified Savings as % of Total Sector Savings	Verified Net Lifecycle Savings (MWh)	Verified Lifecycle Savings as % of Total Sector Savings
	Refrigerator - Bounty	22,650	22,650	100.0%	0.04%	317.10	0.05%
	Refrigerator (Purchase New Only)	957	957	100.0%	0.00%	13.40	0.00%
	Refrigerator (with Recycling of Old)	116,142	116,105	100.0%	0.22%	1,625.47	0.24%
	Room Occupancy Sensors & Timers	325,838	73,289	22.5%	0.14%	586.31	0.09%
	Showerhead	744	54,344	7300.1%	0.10%	326.06	0.05%
	Smartstrip	29,951	23,673	79.0%	0.05%	142.04	0.02%
	Solar Attic Fan	1,342	1,247	93.0%	0.00%	24.95	0.00%
	Solar Water Heating	269,965	269,965	100.0%	0.52%	4,049.47	0.60%
	Submetering (Condo)	626,454	596,481	95.2%	1.15%	4,771.85	0.71%
	T12 to T8 Low Wattage	2,808,595	2,011,434	71.6%	3.88%	28,160.08	4.19%
	T12 to T8 Standard (2 foot lamps)	28,990	12,947	44.7%	0.02%	181.26	0.03%
	T12 to T8 Standard (3 foot lamps)	1,277	1,277	100.0%	0.00%	17.88	0.00%
	T8 to T8 Low Wattage	30,163	31,850	105.6%	0.06%	445.89	0.07%
	Transformer	203,198	203,740	100.3%	0.39%	3,056.10	0.45%
	Variable Refrigerant Flow Air Conditioners	1,212,093	1,318,397	108.8%	2.54%	19,775.95	2.94%
	Variable Frequency Drive – Air Handling Unit	1,810,882	1,129,609	62.4%	2.18%	16,944.13	2.52%
	VFD - Chilled Water / Condenser Water	1,834,631	1,834,631	100.0%	3.54%	27,519.47	4.09%
	VFD Pool Pumps	27,869	27,869	100.0%	0.05%	376.24	0.06%

Table 9. PY2014 Business Sector Verification Results by Program and Measure

Program	Measure	Tracked First Year Net Energy Savings (kWh)	Verified Net First-year Savings (kWh)	Verified % of Claimed Net First Year Savings	Verified Savings as % of Total Sector Savings	Verified Net Lifecycle Savings (MWh)	Verified Lifecycle Savings as % of Total Sector Savings
	Water Cooler Timers	675	675	100.0%	0.00%	3.38	0.00%
	Whole House Fan	1,673	1,673	100.0%	0.00%	33.45	0.00%
	Window AC	4,036	2,140	53.0%	0.00%	19.26	0.00%
	Window Tinting	614,714	689,855	112.2%	1.33%	6,898.55	1.03%
	Subtotal	20,686,641	19,016,004	91.9%	36.70%	282,234	41.99%
Business Services and Maint.	Solar Water Heating Tune-up	526	526	100.0%	0.00%	2.63	0.00%
	Water Pumping	241,023	241,023	100.0%	0.47%	1,205.11	0.18%
	Subtotal	241,549	241,549	100.0%	0.47%	1,208	0.18%
Business Hard to Reach	CFL	83,098	83,098	100.0%	0.16%	1,163.37	0.17%
	Custom Lighting	626,502	626,502	100.0%	1.21%	8,771.03	1.30%
	LED Exit Signs	9,341	11,403	122.1%	0.02%	159.64	0.02%
	LED Lighting	1,879,902	1,879,902	100.0%	3.63%	26,318.63	3.92%
	LED Refrigerated Case Lighting	23,283	23,283	100.0%	0.04%	325.96	0.05%
	Low Flow Spray Rinse Nozzles	583,461	770,168	132.0%	1.49%	9,242.02	1.37%
	T12 to T8 Low Wattage	3,395,283	3,395,283	100.0%	6.55%	47,533.97	7.07%
	T12 to T8 Standard (2 foot lamps)	149,666	149,666	100.0%	0.29%	2,095.32	0.31%
	Subtotal	6,750,534	6,939,304	102.8%	13.39%	95,610	14.22%
Custom Business Energy Efficiency Measures	All Measures	25,621,102	25,621,134	100.0%	49.44%	293,105.78	43.61%
All Business - Total		53,299,826	51,817,991	97.2%	100.00%	672,157	100.00%

5. Residential Sector Verification Method Summary and Result Detail

In PY2014, verified residential sector savings accounted for slightly more than half of all Hawaii Energy portfolio energy and demand savings (at 54% and 55%, respectively), with 101% of tracked first-year net savings being verified.

5.1 Methods

The Evaluation team conducted validation for all residential sector programs with energy savings to claim in PY2014. For each measure type in the tracking database, we validated that the per-unit savings (kW and kWh) and NTG values mirrored the stipulated per-unit savings (when appropriate) and NTGR, and EUL values mirrored the stipulated values documented in the PY2014 TRM. This review consisted of three areas:

- **Savings Estimates.** The Evaluation Team referred to the PY2014 TRM for the correct savings estimates for all non-custom measures. We also checked for any possible duplicates within the program-tracking database.
- **Net-To-Gross.** We applied the estimates in the PY2014 TRM.
- **Effective Useful Life.** The PY2014 TRM includes EULs for all measures. We applied these values.

The Evaluation Team conducted further verification activities by conducting an application/invoice review for measures that accounted for a significant amount of the residential savings. Table 10 provides an overview of the methods, sampling and analysis conducted for residential sector programs. Please refer to Appendix D for more detailed information.

Table 10. PY2014 Residential Sector Verification Method, Sample and Analysis Overview by Program

Program	Percent of Expected First Year Savings	Method	Sample	Analysis
REEM	98.3%	Validation (Step 1)	All measures included	Checked database per-unit, NTG, and EUL values against TRM values.
		Application Review Verification (Step 2)	145 measures: 45 SHW 50 Refrigerator/ Freezers 50 CFLs/LEDs	Checked database values for sample of measures against application / invoice data.
RESM	1.5%	Validation (Step 1)	All measures included	Checked database per-unit, NTG, and EUL values against TRM values.
		Verification (Step 2)	None	Expected savings was very small and not cost effective to evaluate

Program	Percent of Expected First Year Savings	Method	Sample	Analysis
				in this step.
RHTR	0.2%	Validation (Step 1)	All measures included	Checked database per-unit, NTG, and EUL values against TRM values.
		Verification (Step 2)	None	Expected savings was very small and not cost effective to evaluate in this step.

5.2 Results

The residential sector has a high verification rate of 101%. Table 11 shows the overall verification results by program and measure for the residential sector.

Similar to other jurisdictions in which the evaluation team evaluation, per measure category verification rate can range significantly. For Hawaii Energy, the range was primarily due to database issues including database errors leading to incorrect savings values, savings based on outdated deemed values instead of those from the PY2014 TRM and incorrect NTG values being applied to some measures. Specific reasons for differences between PY2014 verified and tracked savings per measure are discussed in Appendix E.

Table 11. PY2014 Residential Sector Verification Results by Program and Measure

Program	Measure	Tracked First Year Net Energy Savings (kWh)	Verified Net First-year Savings (kWh)	Verified % of Tracked Net First Year Savings	Verified Savings as % of Total Sector Savings	Verified Net Lifecycle Savings (MWh)	Verified Lifecycle Savings as % of Total Sector Savings
Residential Energy Efficiency Measures	Ceiling Fans	423,334	164,798	38.9%	0.3%	824.0	0.16%
	CFL	35,883,737	35,883,737	100.0%	56.2%	215,302.4	42.91%
	Clothes Washer	688,263	1,095,878	159.2%	1.7%	12,054.7	2.40%
	Freezer - Bounty	81,682	81,682	100.0%	0.1%	1,143.6	0.23%
	Heat Pump	243,108	265,915	109.4%	0.4%	2,659.1	0.53%
	Home Energy Saving Kits-Online Fulfillment	574,934	574,934	100.0%	0.9%	3,449.6	0.69%
	LED Lighting	9,170,478	7,649,745	83.4%	12.0%	114,746.2	22.87%
	Peer Group Comparison - Phase 1/2/3	5,756,406	7,381,326	128.2%	11.6%	7,381.3	1.47%
	Refrigerator - Bounty	565,682	565,685	100.0%	0.9%	7,919.6	1.58%

Table 11. PY2014 Residential Sector Verification Results by Program and Measure

Program	Measure	Tracked First Year Net Energy Savings (kWh)	Verified Net First-year Savings (kWh)	Verified % of Tracked Net First Year Savings	Verified Savings as % of Total Sector Savings	Verified Net Lifecycle Savings (MWh)	Verified Lifecycle Savings as % of Total Sector Savings
	Refrigerator (Purchase New Only)	24,812	24,814	100.0%	0.0%	347.4	0.07%
	Refrigerator (with Recycling of Old)	2,504,067	2,504,140	100.0%	3.9%	35,058.0	6.99%
	Solar Attic Fan	125,421	116,595	93.0%	0.2%	583.0	0.12%
	Solar Water Heating	3,177,198	3,178,806	100.1%	5.0%	63,576.1	12.67%
	Variable Refrigerant Flow Air Conditioners	846,433	838,728	99.1%	1.3%	12,580.9	2.51%
	Variable Frequency Drive Pool Pumps	109,178	109,178	100.0%	0.2%	1,091.8	0.22%
	Water Cooler Timers	1,755,822	1,834,549	104.5%	2.9%	9,172.7	1.83%
	Whole House Fan	352,265	352,265	100.0%	0.6%	7,045.3	1.40%
	Window Air Conditioner	92,284	48,938	53.0%	0.1%	440.4	0.09%
	Subtotal	62,375,106	62,671,714	100.5%	98.2%	495,376	98.74%
Residential Energy Services and Maint.	Solar Water Heating Tune-up	407,156	430,614	105.8%	0.7%	2,153.1	0.43%
	Subtotal	407,156	430,614	105.8%	0.7%	2,153	0.43%
Residential Hard to Reach	Aerator	34,966	132,598	379.2%	0.2%	795.6	0.16%
	CFL	151,124	206,875	136.9%	0.3%	1,241.2	0.25%
	Showerhead	77,200	295,276	382.5%	0.5%	1,771.7	0.35%
	Smartstrip	70,100	75,874	108.2%	0.1%	379.4	0.08%
	Subtotal	333,391	710,623	213.2%	1.1%	4,187.86	0.83%
All Residential - Total		63,115,652	63,812,950	101.1%	100.0%	501,717	100.00%

6. Transformational Program Validation Methods and Results

The Evaluation Team validation of achievements from the nine transformational programs match the PBFA expected results in terms of the performance award. The PBFA met the target performance indicator for six of the nine programs and the minimum level for the remaining three.

The PBFA provided the Evaluation Team with documents to enable us to validate that each of the nine market transformation activities targeted for evaluation occurred during the PY2014 cycle. Table 12 lists each market transformation activity and the results of our review. Specifically the Evaluation Team validated accomplishments through the following tasks:

- Submission of two data request for Market Transformation activities, two meetings with the PBFA, and multiple email communications to assure our understanding of the data.
- Review of event or workshop attendance spreadsheets/signup sheets, presentation slides, and logic models.
- Review of detailed information, specifically:
  - For the Behavior Modification, Professional Development, Clean Energy Ally, and Technical "Know How" programs, we determined program participation counts. This includes social media engagements, participation in the Professional Development internship program, and number of buildings or sites evaluated within the Energy Systems Integration Pilot's Benchmarking activities.
  - For the Energy Systems Integration Pilots on Codes & Standards, Demand Response, Smart Grid, and Electric Vehicle, we reviewed and counted the number of studies conducted and any other actions/activities performed that aligned with these pilots.

Table 12. PY2014 Transformational Program Validation Summary

Market Transformation Activity	Performance Indicator		Validated Performance		
	Minimum	Target	Results	Met Minimum	Met Target
Behavior Modification	12,600 Participants	18,000 Participants	>65,000 Participants	X	X
Professional Development	750 Participants	1,000 Participants	>1,000 Participants	X	X
Technical 'Know How'	175 Participants	250 Participants	>650 Participants	X	X
Hawaii Energy Ally Program	N/A	200 Allies	224 Allies	X	X
The following five activities are considered as a single item when meeting the performance indicator. All five must meet their individual target levels to meet the overall performance target.					
Benchmarking	200 Sites	500 Sites	> 200 and <500	X	
Codes & Standards	2 Items	3 Items	2 Items	X	
Demand Response	2 Items	3 Items	3 Items		
Smart Grid	2 Items	3 Items	2 items		
Electric Vehicles	2 Items	3 Items	3 items		

Appendix A. Business Sector Verification: Detailed Methods

This appendix provides detailed information on our business sector verification methods. We based the sample design on first-year savings as determined from the program-tracking database for a partial dataset, shown in Table 13. Note that the evaluation schedule required developing our sample frame on 11, rather than 12 months of data. However, the final evaluation results include a full 12 months of data. The partial, 11-month data shown below were only used for sample development.

Table 13. PY2014 Business Sector Tracked Savings Summary (partial data, July 1, 2014-June 2, 2015 for sampling only)

Program	Measures	First-year Savings (GWh)	Percent of First-year Savings
CBEEM	All	25.0	49%
BEEM	Lighting	8.2	16%
	HVAC	7.1	14%
BHTR	All	5.9	12%
All other measures in BEEM (not Lighting or HVAC)		4.3	9%
BESM		0.5	0.9%
Total		**51.0**	**100%**

[a] Savings calculated directly from the first 11 months of PY2014 data from program tracking database

Energy savings is a typical parameter for sample designs in energy efficiency program evaluation. Exploration of the data indicated that a cost-effective sample design could cover close to 90% of the business sector savings if we assured verification of all CBEEM and BHTR measures as well as lighting and HVAC measures from BEEM. Additionally, in order to evaluate island equity, we sampled within the BEEM and BHTR programs at the county level. Due to program differences, we employed a different sample design for CBEEM, as described below.

CBEEM Projects: Site Visits

CBEEM was the largest energy-saving business sector program, conducting 388 projects that resulted in 25 GWh first-year savings in the first 11 months of the PY2014 program. The Evaluation Team conducted 40 desk reviews and 40 site visits to verify savings listed in the program-tracking database. We compared verified energy savings to those presented as expected in the program-tracking database.

Table 14. PY2014 CBEEM Onsite Visit Population and Sample Counts
(partial data, July 1, 2014-June 2, 2015 for sampling only)

County	Projects in first 11 months of PY2014 (N)	Population Percentage (%)	Sample Size (n)	Notes
Honolulu[a]	286	74%	33	Note that the percentages in the sample are not expected to match that of the population since sampling is stratified by savings, not county.
Maui[b]	63	16%	5	
Hawaii	39	10%	2	
Total	**388**	**100%**	**40**	

[a] Honolulu county covers the island of Oahu
[b] Maui county includes the island of Maui and neighboring islands of Molokai and Lanai

Custom programs, such as CBEEM, require a sample design that enables evaluators to apply a subsequent verification rate from the sample back to the population of projects. Because of their very nature, custom projects do not lend themselves to a sample design based on the measures involved. Therefore, energy savings are the best parameter for designing the sample. We used a savings-stratified random sample design to choose which sites to audit, as shown in Table 15.

Table 15. PY2014 CBEEM Onsite Visit Sample Design – Strata Ranges
(partial data, July 1, 2014-June 2, 2015 for sampling only)

Savings Strata	Strata Range (kWh)	Projects in first 11 months of PY2014 (N)	Sample Size (n)	Population Tracked First Year Savings (kWh)	Population % of kWh Savings	Sample Tracked First Year Savings (kWh)
Low	< 65,000	299	11	6,073,577	20.2%	238,958
Med	65,001 - 465,000	76	18	12,335,356	41.0%	3,151,128
High	> 465,000	11	11	10,424,678	38.8%	10,424,678
Total		**386**	**40**	**28,833,611**	**100.0%**	**13,814,764**

Data collection activities for these 40 sites ranged from simple verification that measures were in-place and operating to short-term metering. Three different types of onsite verification activities were conducted, based on the complexity of equipment and systems under review, as shown in Table 16.

Table 16. PY2014 CBEEM Onsite Verification Sites by Type and Strata
(partial data, July 1, 2014-June 2, 2015 for sampling only)

Verification Activity	Example End Use	Low Stratum	Medium Stratum	High Stratum	Total
In place and operating audit	Lighting	8	15	7	**30**
In place and operating audit with knowledgeable engineer	EMS	1	2	1	**4**
Short-term metering	HVAC	2	1	3	**6**
	Total	**11**	**18**	**11**	**40**

Each site had an engineering desk review prior to going onsite. Desk reviews include a complete review of the provided documentation (e.g., incentive applications, equipment invoices, and any other related project information included in the project database) to help outline the methodology behind calculating project energy savings and ensure site visits focus on the parameters needed to execute energy savings calculations.

Desk reviews include the following:

- **Project Documentation Review:** Identify the types of installed measures, quantity of installed measures, and other measure specific characteristics (i.e. wattage, installed location, horse power, etc.).
- **Ex Ante Calculations:** Calculate ex ante savings using information found in project documentation. This step helps identify variables that require on site verification to provide more accurate savings estimates in ex post impacts.
- **Project Magnitude:** Define project size to estimate time needed to perform site visit.
- **Sampling Strategy:** Determine whether sampling within the sample is required to gather adequate data that does not compromise or skew the verification results. If sampling is required, engineers collaborated with Opinion Dynamics to develop an appropriate sampling strategy prior to the site visit. Thirteen sites required sampling designs.

For the six sites for which the desk review indicated a need for short-term metering, the Evaluation Team created M&V plans as described below.

- **Measurement and Verification (M&V) Plan (Level 3 Requirement) including:**
  - Measure description
  - Summary of ex ante calculations
  - Ex post savings methodology
    - Determine what data to use as baseline and how it will be used
    - Determine what data is needed to record while on site and how it will be used
    - Identify algorithms for ex post savings calculations
  - Specific activities to perform while on site (i.e. record nameplate information, interview building operator, discuss hours of operation and plant shutdowns, etc.)
  - Detailed description of monitoring equipment and its purpose

The Evaluation Team independently calculated savings based on data gathered onsite and site-specific information from the PBFA. Each site received a verification rate that was the comparison of the program tracking savings value to the value calculated by the Evaluation Team. After completing verification of all sites, the Evaluation Team provided the PBFA the draft verification rates for each site and met to discuss them. The PBFA questioned the Evaluation Team on our findings from three sites. The PBFA provided additional information that caused us to reassess one of those sites. The subsequent verification rate for that one site improved significantly (from 33% to 100%) but had a small impact on the overall verification rate for CBEEM, moving it from 99% to 100%.

BEEM Lighting and HVAC: Application Review

For all BEEM measures, the Evaluation Team performed a basic review to assure that the per-unit savings (kW and kWh), NTGR, and EUL values in the program-tracking database mirrored the stipulated values documented in the TRM, and that the program-tracking database was calculating correctly. . As shown in the table above, high-efficiency lighting and high-efficiency HVAC represented 30% of BEEM savings. Overall, the tracking database showed 615 BEEM lighting projects and 426 BEEM HVAC projects in the first 11 months of PY2014.

Table 17. PY2014 BEEM Application Review Population and Sample Counts (partial data, July 1, 2014-June 2, 2015 for sampling only)

County	Lighting		HVAC	
	Projects (N) (in first 11 months of PY2014)	Sample Size (n) (Applications Reviewed)	Projects (N) (in first 11 months of PY2014)	Sample Size (n) (Applications Reviewed)
Honolulu[a]	442	16	275	16
Hawaii	77	14	69	14
Maui[b]	96	15	82	14
Total	**615**	**45**	**426**	**44**

[a] Honolulu county covers the island of Oahu
[b] Maui county includes the island of Maui and neighboring islands of Molokai and Lanai

Due to past high realization rates, we chose an error ratio of 0.25 to create a county-level sample design for the lighting and HVAC effort. We verified roughly 15 pieces of each lighting and HVAC equipment for each county, reviewing 45 lighting invoices and 44 HVAC invoices. The Evaluation Team randomly assigned a value between zero and one to each record and ordered them by high to low. The first 14 to 16 high-efficiency lighting and the first 14 or 16 high-efficiency HVAC records in each county formed our sample and the Evaluation Team then obtained all data on the measures associated with the chosen records from the PBFA. Evaluation Team members reviewed the data and checked the invoice data to verify that the underlying quantity and type of data matched those in the program-tracking database.

BHTR: Application Review

For all BHTR measures, the Evaluation Team performed a basic review to assure the per-unit savings (kW and kWh), NTGR, and EUL values in the program-tracking database mirrored the stipulated values documented in the TRM, and that the program-tracking database was calculating correctly. We also conducted a review of applications/invoices for a sample of 45 projects spread across three counties. We reviewed the available application data to assure that the quantity and type of data within the application matched the program-tracking database. Because of the history of high realization rates for this program, we choose an error ratio of 0.25 for this analysis, leading to the sample sizes shown in Table 18.

Table 18. PY2014 BHTR Population Savings and Number of Rebates by County (partial data, July 1, 2014-June 2, 2015 for sampling only)

County	Tracked First Year Savings (kWh) (in first 11 months of PY2014)	Tracked First Year Savings (kW) (in first 11 months of PY2014)	Tracked Measures (N) (in first 11 months of PY2014)	Tracked Rebates (N) (in first 11 months of PY2014)	Sample Size (n) (Applications Reviewed)
Honolulu[a]	4,294,433	528	22,584	596	16
Hawaii	1,151,422	158	5,656	109	15
Maui[b]	492,348	48	3,011	66	14
Total	**5,938,203**	**734**	**31,251**	**771**	**45**

[a] Honolulu county covers the island of Oahu
[b] Maui county includes the island of Maui and neighboring islands of Molokai and Lanai